GERMAN-MONGOLIAN INSTITUTE FOR RESOURCES AND TECHNOLOGY

БОЛОВСРОЛ, ШИНЖЛЭХ УХААНЫ ЯАМ

германы хамтын ажиллагаа

giz

DAAD Deutscher Akademischer Austauschdienst German Academic Exchange Service

Beyond boundaries

Хязгаараас гинаш

Улаанбаатар хот
2023 он

Beyond boundaries

Хязгаараас гарах

Эмхэтгэсэн: Л.Алтангэрэл
У.Мөнхзаяа

Хэвлэлийн хуудас .... хх

Хэвлэлийн Адмон принт ХХК-д эхийг бэлтгэж хэвлэв.

Улаанбаатар хот
2023 он

Өмнөх үг

Монгол-Германы хамтарсан ашигт малтмал, технологийн их сургууль (МГТИС) үүсгэн байгуулагдсаны түүхт 10 жилийн ойн баяраар Монголын дээд боловсролын шинэчлэлийн загварын хэрэгжилтийн бодит үр дүнг илэрхийлэгч төгсөгчдийнхөө амжилт бүтээлийн талаарх энэхүү номыг та бүхэнд өргөн барьж байгаадаа баяртай байна.

МГТИС нь орчин үеийн онолын мэдлэг, чадварыг практик хэрэглээ, хувь хүний хөгжилтэй нягт уялдуулж боловсруулсан сургалтын агуулгыг англи хэлээр түгээн дэлгэрүүлэх, төгсөгчиддөө олон улсын орчин, түвшинд бие даан ажиллах чадамж олгохыг зорин ажилладаг.

2023 оны байдлаар тус сургууль эрдэс баялгийн боловсруулалт, хүрээлэн буй орчин, механик болон үйлдвэрлэлийн инженерийн бакалавр болон магистрын хөтөлбөрүүдээр нийт 140 гаруй үндэсний мэргэжлийн боловсон хүчнийг бэлтгэн гаргаад байна. МГТИС-ийн ихэнх төгсөгчид Оюу Толгой, Энержи Ресурс, Бороо Голд, МАК болон бусад компаниудад ажиллаж байна. Зарим төгсөгчид маань ХНГУ, АНУ, Их Британи, Япон, Унгар, Финлянд зэрэг орны их сургуулиудад ахисан түвшний судалгаа, зэрэг олгох хөтөлбөрт хамрагдсан буюу одоо суралцаж байна. Мега төслүүдэд ажиллаж, дэлхийн мэдлэгийг бүтээх, түгээх үйл хэрэгт амжилттай оролцож буй төгсөгчдөөрөө бид бүхэн бахархаж байна.

Цаашлаад, манай төгсөгчдийн амжилтын түүх нь хамтын хүч буюу оюутнуудын сурах чин эрмэлзэл, академик болон захиргааны ажилтнуудын мэдлэг, ур чадвараа харамгүй хуваалцах сэтгэл, хамгийн чухал нь тэдний хамтын итгэлийнх юм.

Энэхүү номоор төгсөгчдийнхөө амжилт бүтээлийг товч танилцуулж тэдний эх орныхоо хөгжил цэцэглэлтэд оруулж буй хувь нэмрийг тодотгох, шинээр элсэн суралцагчдад урам, итгэл өгөхийг зорьсон болно.

МГТИС-ийн төгсөгчид ямагт шинийг эрэлхийлэгч, бүтээлч, санаачлагч байж салбартаа манлайлагчид болно гэдэгт бид итгэдэг. Тэд бидний гэрэлт ирээдүй билээ.

МГТИС-ИЙН ЗАХИРЛЫН ЗӨВЛӨЛ

Preface

On the occasion of the 10th anniversary of the German-Mongolian Institute for Resources and Technology (GMIT), we are pleased to present our Alumni book as a success indicator of Mongolia's higher education reform and outcomes.

GMIT aims to secure an individual's independent learning and working abilities in an international environment and standard through combining and applying contemporary theoretical knowledge and skills and personal development in its curriculums that are entirely taught in English.

As of 2023, over 140 national professionals graduated from GMIT with bachelor in raw materials and processing, environmental, mechanical, and industrial engineering and also master degrees. Most GMIT graduates work in corporate businesses, including Oyu Tolgoi, Energy Resources, Boroo Gold, MAK, etc. Some GMIT alums are in advanced research and degree programs in Germany, the USA, UK, Japan, Hungary, and Finland. We are privileged to have these successful alums contributing to mega projects and world knowledge production and dissemination.

Furthermore, our graduates' success stories are joined efforts - students' desire to learn and selfless knowledge and skills sharing of academic and administrative staff - most notably their collective trust.

We created this book to highlight our graduates' achievements in work, study, and life, tell their contributory stories to their home country's prosperity, inspire new students, and encourage them to study confidently.

GMIT graduates will always be innovators, creators, and leaders in their fields. We believe in them.

GMIT RECTORATE

Achievement Unlocked: GMIT Class of 2018

Тунхэгт нь гарсан амжилт

Graduated study program – Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Administrator at Epiroc Mongolia LLC – Эпирок Монгол ХХК-д Захиргааны ажилтан
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship 2018 – 2018 онд МГТИС-ийн нэрэмжит тэтгэлэг Summer school scholarship in China University of Mining and Technology 2015 – 2015 онд Хятадын Уул Уурхай Технологийн Их сургуулийн зуны сургалтын тэтгэлэг
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Assessment of Ulaanbaatar air quality based on monitoring stations data - Хэмжилтийн цэгүүдийн өгөгдөл дээр үндэслэн Улаанбаатарын агаарын чанарыг үнэлэх нь

ANU-UJIN SARANTUYA
САРАНТУЯАГИЙН АНУ-ҮЖИН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This thesis assesses the air pollution data from twelve monitoring stations in Ulaanbaatar (UB).

The measurements cover major six pollutants including Particulate Matters (PM10- all particles <10 μm and PM2.5- all particles <2.5 μm), Sulfur dioxide (SO2), Nitrogen dioxide (NO2),

Carbon monoxide (CO) and Ozone (O3). The data obtained from open-source database named Open AQ. Briefly, there are overall 15 monitoring stations in Ulaanbaatar, but 12 of them are connected to the Open AQ source and each station's data collected by 30-minutes range.

In the study, daily, monthly, seasonal and locational analysis of pollutants have been analyzed using time series analysis. The stove emission causes PM2.5 pollution source in Ulaanbaatar during the winter time, and main source for PM10 is suspended dust from the soil. But pollution source apportionment work was not been done. From the result, the pollution in city has strictly seasonal character, and it is different in the central UB and residential (ger) districts. During the winter time, PM2.5 concentration is much higher in the ger districts compared to the central area due to coal burning for heating and cooking, while the central area is mainly apartments and offices heated by central heating system. Last two years, average concentration of the PM2.5 was 90 μg/m3, exceeding WHO guideline 9 times. The average PM10 concentration was 142 μg/m3, exceeding WHO guideline 6 times.

In the meantime, other pollutants such are CO, NO2, O3, and SO2 were also estimated by this study. Annual average concentration of CO from incomplete combustion measured as 1244 μg/m3 for 2016-2017. Comparing to the WHO guideline for annual concentration of CO, it is relatively low. For NO2 and O3, the annual concentrations were 46 μg/m3 and 33 μg/m3, which are both near or lower than WHO guidelines. Annual average concentrations of SO2 from burning coal is 32 μg/m3, exceeding 1.5 times MNS (Mongolian National Standard).

In addition, ratio of PM2.5/PM10 was calculated for data quality control and recommended to Air quality agency to check UB4 Monitoring station PM sensors.

Graduated study program –
Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

- Master program in Hydro Science and Engineering at TU Dresden, Germany - ХБНГУ-ын Дрездений Техникийн их сургуульд Усны инженерчлэлийн магистрын оюутан
- Member of the Board of Governors of GMIT – МГТИС-ийн УЗ-ийн гишүүн

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

DAAD-Development-Related Postgraduate Courses (EPOS) -
Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

Wks Technik LLC, Dresden - ВКС ХХК, Дрезден

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Hygienic assessment of surface, ground and drinking water in The Kharaa River Basin -
Хараа голын сав газрын гадаргын болон гүний ундны усны эрүүл ахуйн үнэлгээ

BOLOR-ERDENE OCHIRBOLD
ОЧИРБОЛДЫН БОЛОР-ЭРДЭНЭ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Mongolia is a water-scarce land-locked country, and available water resources are utilized for multiple purposes including irrigation, food preparation, drinking water for livestock and people. Limited data availability on water hygiene means that the related risks to public health are only partially understood. This is particularly problematic due to the widespread use of unimproved water sources such as surface water and water from simple shallow wells. Based on two field surveys in the Kharaa River Basin in spring 2017 and 2018, we assessed the presence and quantity of total coliforms (TC), fecal coliforms (FC), and E. coli bacteria in surface waters and wells and investigated potential linkages between temperature and hygiene. In the Kharaa River and its tributaries, TC concentrations averaged at a most probable number of (MPN) of 754 ± 761 per 100 mL and FC concentrations at an MPN of 31 ± 33. Only small and non-significant correlations between coliform concentrations and temperature were identified. Coliforms concentrations in wells were lower (average MPN for TC: 550 ± 1286, and for FC 58 ± 253). There was considerable variation between wells, with moderate but significant correlations between temperature and bacterial counts. Low water temperatures in April and May (just above freezing to less than 6.5 °C in wells and 7.5 °C to 14.5 °C in the river system) and the positive correlations between temperature and coliform concentrations particularly for well samples indicate that further warming is likely to increase the risks of microbiological water pollution.

In the future, this should be complemented by modeling at a watershed scale. This should include the consideration of a trend towards stronger rainfall events, changes in livestock density, and urban sewage treatment and discharge, which are other likely drivers of changes in water hygiene

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Steppe Metal Powder LLC -
Талын Метал Нунтаг ХХК

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

GMIT Scholarship -
МГТИС-ийн нэрэмжит тэтгэлэг

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

Energy Resources LLC -
Энержи Ресурс ХХК

Achievements during the study –
Суралцах хугацаанд гаргасан амжилт

1. 2013 The best student of GMIT –
   2013 онд МГТИС-ийн Шилдэг оюутан
2. 2015 Golden Medal of Basketball Competition - 2015 онд МГТИС Сагсан бөмбөг-Алтан медаль;
3. 2016 Bronze medal of GMIT basketball competition -2016 онд МГТИС Сагсан бөмбөг-Хүрэл медаль
4. 2015-2017 Golden medal of GMIT Automatic Robt – Football section (4 times) - 2015-2017 онд МГТИС - Автомат робот-Хөл бөмбөгийн төрөл- Алтан медаль 4 удаа;

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

"Froth Flotation Chemicals Comparison" -
Таван толгойн ордын коксжих нүүрсний хөвүүлэн баяжуулалтын судалгаа

CHINBAYAR MAJAA – МААЖААГИЙН ЧИНБАЯР

Graduated study program –
Төгссөн мэргэжил

Raw Materials and Process Engineering -
Эрдэс баялаг боловсруулалтын инженер

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This research work is devoted to a small area of flotation, which is the laboratory scale batch froth flotation testing in different chemicals and comparing laboratory experiments with industrial froth flotation. In order to obtain an applicable flotation model, two major fields are selected in this research work.

1. In order to overcome the chemical effects of froth flotation. Whatever, using different chemicals and studying moisture, ash, sulfur content, and coking property of the flotation product.
2. In the Heuristic rule for separation operation number four is: 'Prefer separation operations with proven technological experience' (J.Hampe, 2018). Therefore, trying to find factors that connect laboratory flotation with industrial flotation. Then this work will help to bring close laboratory scale into an industrial scale of flotation.

The operating factors include the flotation solids concentration, the airflow rate, impeller speed, the feed size, and the froth stability. The froth stability is closely related to the frothier type and dosage. This research work is carried out to determine the effects of the different chemicals and find out factors of connection between laboratory experiments and industrial experiments.

ENEREL LKHAGVADORJ ЛХАГВАДОРЖИЙН ЭНЭРЭЛ

Graduated study program –
Төгссөн мэргэжил

Raw Materials and Process Engineering -
Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

University of Oulu, Erasmus Mundus Joint Master's program -
Оулугийн их сургууль, Эрасмус Мундусын хамтарсан магистрын хөтөлбөр

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

- DAAD scholarship for exchange semester in Freiberg, 2014 - 2014 Германы эрдмийн солилцооны албаны тэтгэлэг
- GMIT excellent student scholarship, 2014, 2015, 2017 – 2014, 2015, 2017 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- Scholarship for Summer school at CUMT, China, 2015 – 2015 онд БНХАУ-д зуны сургалтын тэтгэлэг
- DAAD scholarship for study in TU-Freiberg, 2017 – 2017 онд Германы эрдмийн солилцооны тэтгэлэгээр ХБНГУ-ын Фрайбергийн техникийн их сургуульд суралцсан

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

MAK LLC - Central Geological Laboratory - МАК технологи судалгааний төв болон Геологийн төв лаборатори

Achievements during the study –
Суралцах хугацаанд гаргасан амжилт

2018 Research grant from GMIT Sustainable Research Development Fund - 2018 онд МГТИС-ийн ССХС-ийн судалгааны төсөл

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Gold leaching: Olon Ovoot gold mine ore Optimal parameters of processing plant - Олон овоотын алтны хүдрийн уусгалт

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Analyze the vibration, to find the sources and to examine for optimal solutions in SBR-160A-24 auger drilling rig. Design and modelling are based on result of this research work.

Auger drilling rigs used in 'Baganuur LLC' coal mine. The company spends half of its expenses of operations costs on auger drill bits. There are a number of reasons such as rotational speed of drill is a constant for drilling different hardness material in layers.

Currently, they do not have any monitoring and automatic control system to manage the current of motor and the rotational speed. The machine can work under high vibration itself and a monitoring system with smart sensors are not suitable for under high vibrations. The experimental result was proved the auger drill rigs had a high vibration.

Thus, it leads to the bachelor thesis is researched vibration causes and their influence. From the measurement results, the vibration reducing solution founded and there some calculation and analysis of modelling done as needed.

Graduated study program – Төгссөн мэргэжил
Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
MSc in Business with Operations Management at the university of Warwick – Английн Варвикийн их сургуульд Үйл ажиллагааны бизнес, менежментийн магистрын оюутан
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship 100%, 2017 - 2017 онд МГТИС-ийн нэрэмжит тэтгэлэг 100%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
The copper oxide heap leaching of Erdenetiin-Ovoo deposit ore: The effect of particle size and residence time for copper recovery - Эрдэнэтийн зэсийн исэлдсэн хүдрийн нуруулдан уусгалт, Дээжийн бутлалтын хэмжээ зэс авалтад нөлөөлөхийг судлах нь

ENKHJIN SEDED
СЭДЭДИЙН ЭНХЖИН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The research continued from 27th of March till 10th of August. Samples were taken from dump of Erdenetiin Ovoo porphyry copper molybdenum deposit located in Orkon aimag of Mongolia that belongs to Achit-Ikht LLC. Achit-Ikht LLC has an operation of low-grade ore dumps nowadays, but there is opportunity to increase leaching efficiency by heap leaching.

The feed ore crushed in jaw crusher and divided into different fractions such as +19mm, +12.5mm, +8mm, -8mm and mixed fraction. The different fractions leached in different columns during 12 to 20 days. All experiments such as column leaching completed in processing laboratory of GMIT. The main focus of research was on particle size and leaching time, however acid curing before leaching, bed height of column and acid consumption discussed in research.

The particle size that provided highest copper concentration was mixed and -8mm fraction. But -8mm size fraction ore is not suitable for heap leaching due to low permeability. The influence of leaching time was massive for mixed and +8mm size fraction. The copper concentration after 20 days was 2 to 3 times greater than 12 days of leaching.

Graduated study program –Төгссөн мэргэжил
Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Senior Material Logistics Officer at Gobi Infrastructure Partners - Говь инфрастракчерс компани, Тавантолгойн нүүрс ачих логистикийн төв барих төсөлд Материал логистикийн ахлах ажилтан
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
Scholarship of GMIT 100% - МГТИС-ийн нэрэмжит тэтгэлэг 100%
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
Energy Resources LLC - Энержи Ресурс ХХК
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Determination of the preparation condition for the rare earth polymetallic ore of Khalzanburgetei - Халзанбүргэтэйн газрын ховор элементийн орд дахь полиметаллын хүдэр бэлтгэлийн судалгаа

MUNKHBAATAR ORGODOL – ОРГОДОЛЫН МӨНХБААТАР

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Rare earth metals are magic. The rare earth elements play a key role in the expected growth of many emerging clean energy technologies. The next generation of wind and hydro power turbines, batteries, motors to power electric vehicles and fuel cells are example applications. Moreover, the REE used for health, military defense and advanced communications including drug treatments, diagnostic techniques, MRI and visors protection, aircraft parts and GPS, space-based satellites and communication systems.

Therefore, developed countries mostly used these elements. However, China is restricting rare earths exports to other countries because they are responsible for 97% global output. Therefore, I have chosen the rare earth elements topic because Mongolia has a big number of resources and we could export our raw material to developed countries. We have an interest in extracting rare earth metals and exporting. Therefore, the rare earth metals study is developing in Mongolia.

This study was performed with 2 main goals in mind on the mechanical processing of the Khanburgedei polymetallic rare earth mineral ore. The thesis attempts to develop sample preparation of rare earth metals, sieve analysis and to determine optimum time of grinding in three different P80 values should be carried out and compared with mineralogical analysis results for 125ppm. In addition, I focused on the charge volume of grinding to get a good result.

Rare earth metal sample taken from the Khovd province very near in Myngad soum. Around 80 kg samples were selected to experiment. The sample used to crush, grind and sieve analysis. After grinding the sub samples tested for chemical analysis to determine content of each element in the sample.

The results confirmed the rare earth metals are liberated at 125 ppm which proved by chemical analysis. A result obtained from the research was compared with the mineralogical analysis. And according to comparison the chemical analysis and mineralogical analysis target are met.

In summary, sample preparation is the main procedure of processing that would affect processing results. Coning and quartering method was the main method for taking a good representative sample. But we need more investigation on this. Another method is more effective than coning and quartering. Another point, the time of grinding depends on ball mill charge including water volume, ore mass and ball mass. 25 min of grinding is a suitable size to reach all minerals. It is anticipated that this research will lead to a greater understanding of the significance of grinding as time for making more small sizes achieved that have the potential to improve which factors are affecting grinding time optimization.

MUNKHTSETSEG AMARJARGAL – АМАРЖАРГАЛЫН МӨНХЦЭЦЭГ

Graduated study program – Төгссөн мэргэжил

Raw Material Process Engineer -
Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Reliability Engineer at Epiroc Mongolia - Эпирок Монголиа ХХК-д Найдвартай ажиллагааны инженер

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship 100%, 50% - МГТИС-ийн нэрэмжит тэтгэлэг 100%, 50%;
- DAAD scholarship for exchange semester in Freiberg, 2014 – 2014 онд Германы эрдмийн солилцооны албаны оюутан солилцооны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

Energy Resources LLC - Ukhaa khudag coal processing plant -
Энержи Ресурс ХХК Ухаа Худаг нүүрс боловсруулах станц

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

One of became the first 3 students selected for the student exchange program - Анхны оюутан солилцооны хөтөлбөрийн гурван оюутны нэгээр сонгогдсон.

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Coking of coal: Perspective for Mongolia - Монгол дахь нүүрс коксжуулах технологийн хэтийн төлөв

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Mongolia is rich in coal, copper, rare earth, and gold ores. In the past 20 years, the Mongolian economy strongly relayed on the mining sectors. The mining industry contributed around one-quarter to Mongolia's gross domestic product in 2014. Unfortunately, this number is only a result of the export of the minerals as raw materials. No mining company produces the final product from an ore deposit in Mongolia. On the one hand it is a pity that Mongolia earns less income than what would be possible, but on the other hand, there is a free market waiting for companies to develop the mineral processing sector.
In this research, I studied one of the advanced coal processing technologies, i. e. coal coking. The main reason to choose coal is its availability with 37.4 billion tons of proven coal reserves in Mongolia. The range of coal type includes lignite, sub-bituminous, bituminous, and premium-bituminous coal. Mongolia became the 5th largest exporter of coking coal due to active mining in the south Gobi area. Based on current coking coal mining deposits, there is a chance to produce coke in order to add value to the raw material.
The coke has a significant role in a metallurgical plant due to its high calorific value and other characteristics. As Mongolia has no own blast furnace metallurgical plant, and as the Chinese coke demand is still growing, thus Mongolian coke could be exported to China.
This study aims at a preliminary design for a coke-making plant based on available coking coal feed. To do that, coking technologies, products, and by-products need to be studied.
This thesis focusses on theoretical process design and development tools and does not have an experimental part. In order to develop the design of the coke-making plant, the systematic process systems engineering approach is followed with its procedure on the functional level, the physics level, and the embodiment level.
The first chapter introduces fundamental information of the research work. After the study of the fundamentals of coke technologies, the functions are determined. The functional level chapter introduces the very basic flowchart of the plant and reveals the must-have functions of the processing steps.

On the physics level, all physical and safety properties of the substances that are evolved during the coke-making process are clarified. Based on the physical properties, especially the boiling point ranges, the separation technologies are chosen. Worldwide coke-making technology is developed very well regarding their separation units. The chosen techniques are explained in the physics level chapter. The final study sector is the exemplary simulation of a separation sequence.
The simulation is performed on the Aspen Plus program. In order to have mass balance, the plant capacity is calculated and then become a base for the simulation analysis. The last process analysis chapter introduces the result of the simulation process and their descriptions.

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Energy Resources LLC (Mongolian mining corporation HKEX 975) - Энержи Ресурс (Монголын Уул Уурхайн Корпораци)

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

Anglo American scholarship -
Англо Америк тэтгэлэг

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

- Energy Resourceы LLC -
  Энержи Ресурс ХХК
- Oyu Tolgoi LLC - Оюу Толгой ХХК
- Darkhan Power Plant -
  Дарханы дулааны цахилгаан станц
- Anglo American PLC -
  Англо-Америк Пи Эл Си

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Arsenic in Nalaikhs' Surface waters- Monitoring project "Environmental impacts of small-scale coal mining in Nalaikh" - Налайхын гадаргын дахь хүнцлийн агууламжийн мониторинг

SAINSANAA AMARSANAA – АМАРСАНААГИЙН САЙНСАНАА

Graduated study program –
Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Nalaikh is located in Ulaanbaatar, Mongolia, known for illegal mining activity. Earlier investigations concerned mining land disturbance and pointed on air, soil and importantly water. Which revealed in unexpected arsenic, which is a highly toxic element, exposure in the Bus Lake. The research is aimed to find seasonal and weather changes of the Bus Lake characteristics and indicating level of toxicity.

The research continued from November 2017 till May 2018. Samples were taken from the local groundwater, stream water and the Bus Lake totally 48 samples measured. Main Water characteristics which are pH, redox potential, dissolved oxygen and dissolved solids measured by field equipment, and total and dissolved arsenic content was examined in the central geological laboratory (CGL). Stream water and groundwater arsenic concentration were low. However, Bus lake appearance and arsenic specie was particularly related to temperature and seasonal changes and transition from winter to summer period trivalent arsenic [highly toxic] was found. Plus, entirely arsenic load was exceeding WHO recommended limit [0.01mg/L].

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Specialist Business Improvement at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Бизнес хөгжлийн мэргэжилтэн

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

Excellent Student Scholarship, 2017, 2018 – 2017, 2018 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлэг

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

Oyu Tolgoi LLC - Оюу-Толгой ХХК

Achievements during the study –
Суралцах хугацаанд гаргасан амжилт

1. GMIT Biodiesel Project - МГТИС "Биодизель" төсөл
2. Student Clubs at GMIT - МГТИС дахь оюутны клубууд
3. "Coffee corner" student project funded by ADB - "Кофе булан" оюутны төсөл, АХБ

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Transfer Chute Design Modification Using Discrete Element Method - Дискрет элментийн аргыг ашиглан дамжуулах урсгуурын загварыг сайжруулах

SUKHBAT ALTANGEREL – АЛТАНГЭРЭЛИЙН СҮХБАТ

Graduated study program –
Төгссөн мэргэжил

Mechanical Engineering - Механик инженер

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This bachelor work is aimed to modify currently operating transfer chute design with the help of bulk material simulation. The use of Discrete Element Method (DEM) allows the engineers to design and/or optimize bulk material handling facilities with the great precision.

The latest trending simulation approach is to use DEM as it precisely calculates inter particle collision, forces that created from collision, accelerations that is created from forces, velocities and displacements for each and every particle. Bulk material flow behavior in the chute interior could be realistically predicted by DEM if it is used correctly.

The main objective of this work is to analyze existing transfer chute at Oyu Tolgoi mine, as it is experiencing high wear problem on the chute liners. Problem causing roots would be detected and analyzed for optimal solutions. Design modification would be done as one of the results of this research work.

TEMUULEN PUREVDORJ – ПҮРЭВДОРЖИЙН ТЭМҮҮЛЭН

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering -Механик Инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Master for Sustainable Renewable Energy in University of Oldenburg, Germany - ХБНГУ-ын Олденбургийн Их сургуульд Тогтвортой сэргээгдэх эрчим хүчний магистрын оюутан

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT scholarship, 7 consecutive - МГТИС нэрэмжит тэтгэлэг, 7 удаа дараалан
- DAAD scholarship - Германы эрдмийн солилцооны албаны тэтгэлэг
- Oyu-Tolgoi LLC domestic scholarship 3 semesters - Оюу Толгой ХХК-ны нэрэмжит тэтгэлэг 3 семестер дараалан авсан.

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Oyu Tolgoi LLC - Оюу-Толгой ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. Chemistry Olympiad - special place (4th place) - Химийн Олимпиад- Тусгай байр
2. Founder of Coffee Corner in GMIT - МГТИС Кофе корнерыг үүсгэн байгуулагч
3. Founder of Auto Cad club and its first moderator - Авто клубыг үүсгэн байгуулагч бөгөөд анхны зохицуулагч.
4. First official president of GMIT student council for 2 semesters - Оюутны зөвлөлийн анхны ерөнхийлөгч.

Bachelor thesis topic –Бакалаврын дипломын сэдэв

Elongation of chute liner from material perspective – Материал талаас судалж, урсгуурын ашиглалтын хугацааг уртасгах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This study has looked into wearing mechanism on liners in transfer chute used at Oyu Tolgoi mine. And it searched for ways to reduce wearing rate so that the mining operation could benefit in numerous ways. Wearing takes place dominantly in form of abrasive wear whose base is on micro-cutting mechanism. Worn liner samples made of Hardox 500 mark and a bag of coarse ore were provided for study purpose by the company. For referential purpose, the same intended steel marked as 110Г10Л was requisted and supplied from Erdenet Mine. After analytic analyses, it has been still believed that wearing rate advances as thickness of liners reduce. The conducted hardness test shows hardness gradient, emphasizing wear rate deviation. But microscopic analysis does not show much of evidence that wearing rate could be different over thickness. And heterogeneous wearing rate over liners was noted. The employed steel - (as producers state that martensite - bainitic structured) Hardox 500 for making liners, is known as the best selection for operation under high abrasive conditions. No material enhancement effort was made, therefore. Instead, combination in usage of hardox 500 and 550 was suggested for more homogeneous wearing rate distribution over the liners. At the most optimistic scenario, the combination could increase chute service time by 100% and reduce liner inefficient use by 28.9%. Taken assumptions for the estimations may be superior. Sections dedicated for studying hardox steels' usage, mechanical properties, suppliers' statement are present in the study.

There were so many case studies on the internet explaining and praising use of a sophisticated modern computational softwares based on Discrete Element Method on chute design. Not only chute that is its reach but also all heavy machines that work with bulk materials: comminutors, mills, chutes, mixers, silos and so on. But almost no work has been found on matter of wear mechanism from material scientists' perception, at least among studies that are costless. A custom method determining wear rate was attempted to be developed analytically. But it has been omitted in the report due to required data was not possible to obtain. On-site measurements were vital for the method to become mature.

TENGISDULGUUN TUMENJARGAL – ТҮМЭНЖАРГАЛЫН ТЭНГИСДӨЛГӨӨН

Graduated study program –Төгссөн мэргэжил
Mechanical Engineering -Механик Инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Tavan Bogd Motors LLC - Таван Богд Моторс ХХК
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship, 2013, 2014 – 2013, 2014 онд МГТИС-ийн нэрэмжит тэтгэлэг
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
Wagner Asia LLC - ВагнерАзи ХХК
Achievements during the study – Суралцах хугацаанд гаргасан амжилт
• Basketball league – Сагсан бөмбөгийн лиг • Technical Olympiad - Техникийн олимпиад
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Possibility of Alteration of the ore mechanical property for Improvement of conveyor chute - Оюутолгойн хүдэрийн механик шинж чанараас уусгуурын сайжруулалт хамаарах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The mining industry has been expanding rapidly in Mongolia for last 2 decades. As a result, many problems are arising which require solutions from Mongolian engineers.
Effectiveness and productivity of copper mining industry depend on appropriate actions and processes of various types of devices, techniques and machineries, which are used at mining sites. One of these important devices is a transfer chute.
At Oyu Tolgoi mining site the discharge chute maintenance takes place every four weeks due to the wear and tear of liner and belt. It causes many difficulties at the Oyu Tolgoi mining site.
The purpose of this thesis is to improve the chute design in the copper mining industry, in particular to calculate and evaluate how the ore properties influence the wear and tear of the chute's liner and conveyor belt.
A brief introduction on basic elements of mining and processes of copper mining is given. Also in our study we attempted to review the required literature on some key aspects of chute design theory.
In our study we used a variety of geometrical, mathematical and mechanical engineering formulae and theories. In addition, we used computer programmers such as MATlab, Inventor and EDEM.
We concluded that the transfer chute problem occurs not only at Oyu Tolgoi, but throughout the world. Globally, mining industries in many countries have chute design problems. Researchers have been studying these problems for years considering different aspects of it. According to the researchers one of these aspects of chute problem could be the influence of the ore property.
Regarding the Oyu Tolgoi transfer chute, when we calculated the influence of ore mechanical property to the chute perforation, the ore causes 572 Pa pressure to the chute linear and there is no possibility to perforate chute linear when using Hard ox 500. Following the results of this calculation we raised a hypothesis that we need to study morphological properties of ore. According to our calculations and study, the ore has high pressure impact for a small area, specifically smaller than 184,3 mm2. area. During the ore crashing process sharp, apical, spiky parts were carried to the chute and these parts cause the chute perforation and cause the problem to chute linear.
Resulting from above mentioned inference we concluded that in order to reduce transfer chute linear perforation, it would be a better practice to change the morphology of ore therefore to widen chute linear contacting area. In order to achieve these goals, it's needed to reduce ore particle size at the previous process (stage) of primary crushing process. Solving transfer chute problem needs further careful studies on changing and researching chute geometrical design and chute body material.
We suggest that there are still a number of open issues for research in improvement of chute design. The further researchers are needed to enrich combined experimental and theoretical study on changing chute geometrical design and chute body material in efficient ways.

Graduated study program –Төгссөн мэргэжил
Mechanical Engineering -Механик инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Asset Health Technician - Эд хөрөнгө хариуцсан мэргэжилтэн
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship - МГТИС-ийн нэрэмжит тэтгэлэг
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
Transwest LLC - Трансвест ХХК
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Development of selected routines (procedures) in the CAM post-processing for CNC, Vertical Machining Center - CNC босоо зорогч төхөөрөмжийн CAM дараагийн шатны боловсруулалтанд зориулан сонгосон горимын хөгжүүлэлт

TUGULDUR TULGA –
ТУЛГЫН ТӨГӨЛДӨР

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

CAD/CAM software are used for modelling and simulating. However, they are not enough for the CNC machines to manufacture a product. Here, the post-processing plays an important role customizing the CAD/CAM codes and making them understandable for the machine. It doesn't matter whether the CNC machine is modern or expensive, each machine needs post-processing to ensure the codes are optimum for the machines to operate at its finest.

The goal of this thesis was to develop a modified post-builder specifically for "Victor Taichung Vcenter-102e" CNC machine which is in operation at Darkhangeomach company. The task included among other things such as creating 3D-model and operations on "Siements PLM NX10" software and making a real-time simulation on "Nanjing SwanSoft" CNC simulator for verifying the G-code. The G-codes were generated by "Siements PLM NX 10" and post-processed by using NX post-builder software considering. The post processed G-code is then used on Vc-102e machine to manufacture a piece which is assigned by Batbayar Erdenee, CEO Darkhangeomach.

Emerging Minds, Inspired Futures: GMIT Class of 2019

Хөгжмэс бүй олоун ухаан,
Ураам зоригтой ирээдүй

Graduated study program –Төгссөн мэргэжил
Mechanical Engineering -Механик инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Under Ground at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Гүний уурхайд ажиллаж байна
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
Energy Resources LLC - Энержи Ресурс ХХК
Achievements during the study – Суралцах хугацаанд гаргасан амжилт
• GMIT basketball tournament, 1st place - МГТИС-ийн сагсан бөмбөгийн тэмцээнд 1-р байр • AutoCAD category of Mongolian young engineer, 4th place - Монгол залуу инженерийн Автокад төрөлд 4-р байр
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Development of road dust filter to attached on a public bus in Ulaanbaatar - Улаанбаатар хотын авто замын тоосонцрыг багасгах.

BALJINNYAM GUNTEVSUREN – ГҮНТЭВСҮРЭНГИЙН БАЛЖИННЯМ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This thesis work focused on road dust reduction in Ulaanbaatar by filtering. It searched for ways to reduce the airborne with the filter attached on public bus operated in Ulaanbaatar city. The road dust contains the PMIO and PM2.5 which are one of the dangerous materials in air pollution and can affect human health. The airflow around a public bus was simulated by ANSYS CFD software.

ANSYS Workbench 19.2 can simulate the with the pressure distribution around the bus, velocity streamlines and drag force. ANSYS has some fluid flow solvers which are fluent and CFX. In this study, CFX solver used to get an accurate result. The airflow around the public bus of the wind could be predicted by ANSYS computer fluid dynamics.

Thesis main purpose of this study was collecting road dust from several locations within the filter. There are two methods used for collecting the dust sample. First ones were dust collected from the specific locations without the filtering and another one was road dust collected with the filter to be attached on a public bus. Filter (activated •carbon air filter) was attached back of the public bus with the additional motor, because this location is more efficient way to collecting dust from the air.

The motor principle was just sucking the air into the air filter. This motor was working two weeks (186 hours). Each weeks had different way to sucking the air (inlet of the motor). First week 30g and next week 125g of PM2.5was collected.

Graduated study program –Төгссөн мэргэжил
Mechanical Engineering -Механик инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Mechanical & Piping Engineer at MCS Property (Oyu-Tolgoi Underground Project) - MCS проперти-д Механик, шугам хоолойн инженер (Оюу-Толгой гүний уурхайн төсөл)
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
• Geomaster LLC - Дархан Геомастер • Energy Resources LLC - Энержи Ресурс ХХК
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Reducing of vibration influence on auger drilling rig (SBR-160A-24) - Эргэлтэд өрмийн машины (СБР-160А-24) доргиог багасгах

BATSUURI DALAINYAM – ДАЛАЙНЯМЫН БАТСУУРЬ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The main objective of this work is to analyze the vibration, to find the sources and to examine for optimal solutions in SBR-160A-24 auger drilling rig. Design and modelling are based on result of this research work.

Auger drilling rigs used in 'Baganuur LLC' coal mine. The company spends half of its expenses of operations costs on auger drill bits. There are a number of reasons such as rotational speed of drill is a constant for drilling different hardness material in layers.

Currently, they do not have any monitoring and automatic control system to manage the current of motor and the rotational speed. The machine can work under high vibration itself and a monitoring system with smart sensors are not suitable for under high vibrations. The experimental result was proved the auger drill rigs had a high vibration.

Thus, it leads to the bachelor thesis is researched vibration causes and their influence. From the measurement results, the vibration reducing solution founded and there some calculation and analysis of modelling done as needed.

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Senior Specialist at the technical department at Mongolyn Alt LLC – МАК ХХК-д Технологи, тоног төхөөрөмж, судалгааны ахлах мэргэжилтэн

Completed master study program if available (year, university, study program, thesis topic) –
Магистрын зэрэгтэй бол хэзээ аль сургуульд, ямар хөтөлбөрөөр, дипломын сэдэв

International master of science in Advanced Mineral Resources (AMDR) in 2022, (1 semester at University Montan, 3 semesters at TUBAF) – 2022 онд Австри улсын Лөбэн болон Герман улсын Фрайбергийн их сургуулиудын хамтарсан "Эрдэс баялгийн дэвшилтэт технологи"-ийн магистрын хөтөлбөрийг төгссөн.

Topic/Сэдэв: Modelling swelling potential of clayey soils using artificial intelligence and comparison with empirical and semi-empirical correlations

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Life Time Evaluation of Laser-Coated Pump Parts in the Mineral Processing Industry - Баяжуулах үйлдвэр дэх лазер технологи ашиглах, бүрсэн насосны эд ангиудын ашиглалтын хугацааг үнэлэх.

DULGUUN NARMANDAKH – НАРМАНДАХЫН ДӨЛГӨӨН

Graduated study program –Төгссөн мэргэжил

Mechanical engineering -Механик инженер

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This thesis aims to choose the best laser coating powder system among experimented materials and to estimate the useful life of specific laser coated pump parts. Slurry pumps in mineral processing are parts which erode away very quickly. Erosion is dominantly caused by abrasion from fine particles of the ore. Due to its cause, the process of erosion takes place on impeller blades and cover plates which have direct contact with the slurry.

Erdenet Mining Corporation has cooperated with GMIT and Prof. Dr. Gunther Stehr for this thesis work as a project. The Corporation supplied self-produced impeller and cover plate of the slurry pump (GrAT–1400/40). This type of pump is designed in Russia. It used for delivering Copper and Molybdenum ore in Concentration Plant at Erdenet Mining Corporation.

The GRAT – 1400/40 pump parts were delivered to Germany for laser coating and shipped back for trial. At Concentration Plant of Erdenet Mining Company, we used three different thermal coatings to have early research point to gain the most suitable solution as trial. Technical estimations have been done.

Without changing design or base material (economically suitable material for the area), gaining higher lifetime is very important. Achieving favorable result would greatly benefit industries which specifically uses pump for delivering slurry.

Graduated study program –Төгссөн мэргэжил
Raw materials and process engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Master study program in Materials Engineering at RWTH Aachen University – Аахены их сургуульд Материалын инженерчлэлийн магистрын оюутан
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
Khutut Basement LLC scholarship 2014-2019 – 2014-2019 онд Хөтөл цемент үйлдвэрийн тэтгэлэг
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Investigation of the Mine-ability of Mongolian Phosphate deposits in view of Economic and Environmental future prospects - Монгол улсын Фосфорын зарим ордуудыг ирээдүйн эдийн засаг, байгаль орчны нөлөөллөөс шалтгаалан ашиглах боломжийн судалгаа

GANZORIG OROSOO – ОРОСООГИЙН ГАНЗОРИГ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

From an environmental point of view, Compared to the 15 different origin of phosphate mining's toxic metal concentrations, the Burenkhan first deposit content of arsenic is two times higher, lead 0.18 times lower,while uranium six times lower, and strontium is again 0.27 times lower. The biggest environmental problem is related to the phosphogypsum (PG) stacks. PG stacks usually contains heavy metals and metalloids. Furthermore, gypsum stacks are covering a lot of areas and it requires monitoring to avoid failure.

There is some utilization of PG stacks to make good quality products by using advanced technology. From economical perspective, we would say, period of two years payback (Case I) and 3.4 year payback period (Case II) are mineable. If the waste/ore ratio is about 1:1, 2:1 and 4:1, then we could have a chance to mine the ore with a high profit. Otherwise, we cannot mine the deposit economically. Compared to the different version of projects Burenkhan first deposit have a high grade of phosphate rock concentration (P2O5), low payback period, and high NPV. Those factors illustrates how to mine in the deposit more efficiently. Also, the easiest international indicator to mine marketable is the concentration of P2O5 that should be higher than 30%.

The life time of Burenkhan first deposit is about 18.19 years and the annual operating profits are 91.5 (Case I), 67.6 (Case II) and 16.4 (Case III) million U.S. dollar. Burenkhan first deposit vertical meter (vm) is from 80 to 380. Therefore, it is more economic to extract ore by surface mining method. The cheapest beneficiation techniques are crushing, screening or scrubbing, and de-sliming. The main conventional concentrating technique is froth flotation because this technique is more suitable for quartz, chalcedony, and silica containing phosphate rock minerals. The hardness of the phosphorites is 5-8 in Mohs scale. Therefore, discontinued mining method is more suitable.

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

- 2015 GMIT Excellent Student Scholarship – 2015 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- 2017 GMIT Excellent Student Scholarship - 2017 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- 2018 GMIT Excellent Student Scholarship - 2018 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

Schachtbau Nordhausen GmbH – Шахтбау Нордхаизен ХХК

Achievements during the study –
Суралцах хугацаанд гаргасан амжилт

"Who Knows Chemistry?" first place in the competition, organized NUM - МУИС, Шинжлэх ухааны сургуулиас зохион байгуулсан "Химийн шинжлэх ухааныг хэн сайн мэдэх вэ?" тэмцээнд 1-р байр.

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Identification of industrial waste liquids applicable for the suppression of mining and processing generated dust -
Уул уурхайн болон боловсруулалтын явцад үүссэн тоосыг дарахад ашиглаж болох үйлдвэрийн хаягдал шингэнийг тодорхойлох

JARGALMAA OLONBAYAR – ОЛОНБАЯРЫН ЖАРГАЛМАА

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering -
Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Product Support Engineer at FLSmidth Mongolia LLC -
ФЛСмидт Монголиа ХХК-д Тоног төхөөрөмжийн инженер

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The Industrial Revolution, which took place from the 18th to 19th centuries, was a period during which predominantly agrarian, rural societies became industrial and manufacturing-dominated ones. Industrialization marked a shift to powered, special-purpose machinery, factories and mass production. Industrialization progressed by help of more and more natural resources to speed up productions. Since then mining industry plays significant transformation during the Industrial revolution time. At this time the Mineral revolution began with the discovery of diverse kind of natural resources became essential materials, used to make everything from appliances, tools and machines, to ships, building and infrastructure.
While industrialization brought about an increased volume and variety of manufactured goods and an improved standard of living for some, it also raises some issues that were amplified by the developing industry. The global challenges of global warming, destruction of wildlife habitat and air pollution can be traced back to this moment in human history. In particular, the world's mining environmental problems began by the Industrial Revolution. A mining operation can have significant impacts on its surrounding Environment during all phases like active and abandoned mines. In primary process of mining operations include extraction (loosening of the mineral from the ground and loading on transport equipment), transporting (transport of the extract material with transport equipment from the extraction place to destination point) and dumping (unloading of the transported material). Those major mining operations have been source of atmospheric dust emissions since industrialization began. Dust is formed by non-usable part of the mineral production consists of mineral with insufficient concentration, material with a high share of trace minerals and tailings.
The Mine Safety and Health Administration (MSHA) defines dust as: "Finely divided solids that may become airborne from the original state without any chemical or physical change other than fracture".

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

First officer at Hunnu Air LLC - Хүннү Эйр ХХК-д Хамтран нисгэгч

Completed master study program if available (year, university, study program, thesis topic) –
Магистрын зэрэгтэй бол хэзээ аль сургуульд, ямар хөтөлбөрөөр, дипломын сэдэв

Commercial Pilot at Flying Academy in Miami, United States 2020 - 2020 онд Америкийн Нэгдсэн улсын Майми хотод Нисгэгчийн нарийн мэргэшил олгох сургалтыг дүүргэсэн

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

- DAAD scholarship, 2017, 2018 – 2017, 2018 онд Германы эрдмийн солилцооны албаны тэтгэлэг
- GMIT's excellent student - МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг

Professional internship place -
Үйлдвэрлэлийн дадлага хийсэн компани

MIBRAG mbH – Мибарг ХХК, ХБНГУ

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Analysis of Coal Combustion By-Products (CCBs) in Mongolia in Consideration of the Characteristics to be suitable for Backfilling and Securing of abandoned Small Scale Coal Mines - Гүний бичил уурхайд нүүрсний шаталтаас үүссэн хаягдал бүтээгдэхүүнүүд дүүргэлтийн материал болох боломжийн судалгаа.

KHANGAI GERELSUKH – ГЭРЭЛСҮХИЙН ХАНГАЙ

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер

ABSTRACT OF BACHELOR THESIS:

The research aimed to evaluate the possibility to use CCBs and industrial wastes for backfilling material for underground mines. Hundreds of thousand tons of CCBs in Mongolia is being landfilled despite its economical and beneficial properties. Following tests and analyses were made to evaluate CCBs and industrial wastes: sieve analysis, SEM analysis, radioactivity detection, moisture content analysis, XRF chemical content analysis, uniaxial compression test, elution test and FTIR analysis. Total of 9 CCBs and 1 electric-arc furnace slag from 7 different location/plant have been evaluated to represent Mongolian CCBs. Backfill mix designs were designed to compare the materials and to choose the best suited material for backfilling purpose.

During the research, fly ash from the thermal plant #4 and ger district bottom ash had been proven as a suitable material for backfilling while other material can be utilized but, other binder additives such as portland cement must be used. Any of the evaluated materials in this research are investigated not being harmful to environment and to human health.

Fly ash and ger district ash are the most common CCBs in Mongolia. More than 200 thousand tons of fly ash and another 200-230 thousand tons of ger district bottom ash are being generated annually.

БАКАЛАВРЫН ДИПЛОМЫН АЖЛЫН ХУРААНГУЙ:

Судалгааны ажил нь гүний уурхайн дүүргэлтийн материалд нүүрсний шаталтаас үүссэн хаягдал материал (ССВ) болон үйлдвэрлэлийн хог хаягдлыг ашиглах боломжийг үнэлэх зорилготой байв. Монголд олон зуун мянган тонн ССВ-г эдийн засгийн хувьд ашигтай, ашигтай шинж чанартай байж болох ч хаягдал болж байна.

Нийт 7 байршил болон үйлдвэрээс 9 ширхэг нүүрсний үнс, 1 цахилгаан нуман зуухны шаарыг авч Монгол улсын нүүрсний шаталтаас үүссэн хаягдал материалуудыг (ССВ) төлөөлүүлэв. Дүүргэлтийн материалуудыг харьцуулах болон шилэх зорилгоор тусгай зуурмагууд зууран харьцуулав. Судалгааны

үндсэн дээр гэр хорооллын зуухны үнс болон 4-р цахилгаан станцын цахилгаан соронзон шүүлтүүрээс (ESP) гарсан дэгдэмхий үнс (fly ash) дүүргэлтийн материалаар ашиглагдах бүрэн боломжтойг харуулав.

Graduated study program –Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Technical coordinator at Sustainable Plastic Recycling in Mongolia – Монгол улс дахь хуванцар хог хаягдлын дахин боловсруулалтын тогтвортой байдлыг хангах төслийн техникийн зохицуулагч
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 50% - МГТИС-ийн нэрэмжит тэтгэлэг 50% • GMIT scholarship 100% - МГТИС-ийн нэрэмжит тэтгэлэг 100%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Determination of Deoxygenation Rate Constant for BOD Reaction in Mongolia - Биологийн хэрэгцээт хүчилтөрөгчийн урвал дахь хүчилтөрөгчгүйжүүлэх коэффициентийг Монголын нөхцөлд тодорхойлох нь

SANCHIRGARAV BATZORIG – БАТЗОРИГИЙН САНЧИРГАРАВ

BSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The objective of this study was to estimate the deoxygenation rate constant and the ultimate BOD of WWTP effluent in Mongolia. The deoxygenation rate was determined and tested in April, 2019. The Deoxygenation rate was 0.27 /day which is a bit higher than values from other countries. The ultimate BOD was in the range of 92- 115 mg /L. Biological oxygen demand values did not meet the limits recommended by the Mongolian National standard throughout entire study period.

This knowledge of ultimate BOD, the rates of deoxygenation in BOD reaction can be significantly valuable for designing reliable of biological treatment processes in WWTP.

Graduated study program –Төгссөн мэргэжил
Raw materials and process engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Suveyor engineer at Normount LLC – Нормаунт ХХК-д маркшейдер инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Identification the types of battery used in Mongolia due to find opportunity of recycling - Монголд хэрэглэгддэг баттерейны төрөл болон тэдгээрийг дахин боловсруулах арга замыг судлах

SERGELEN ODNYAM –
ОДНЯМЫН СЭРГЭЛЭН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This bachelor thesis aimed to determine the types of battery used in Mongolia due to find opportunity of recycling. The 21st century is battery's era, all of electrical devices related to battery. The battery is modern world necessary portable energy resources. Battery is converted chemical energy to electrical energy.

In Mongolia a numerous type of battery used. Mongolian Customs provide us the data and information of batteries used in Mongolia. The data displays between 2011 and 2018 of battery types and actual amount. In the data, only expression manganese dioxide, lithium- ion, zinc-air and silver oxide. Other types of batteries not included data of Mongolian Customs. China, Federal Republic of Germany, Republic of Korea, United States of America and Japan are the main exporter countries of Mongolia.

There are several types of batteries. This thesis mostly consider about lithium-ion battery because usage of lithium-ion battery is rather high in Mongolia. Many types of process to recycling lithium-ion battery. As well as hydrometallurgical recycling, pyrometallurgical recycling, intermediate recycling process, direct recycling, bioleaching and mechanochemical process.

Thesis topic/ Дипломын ажлын сэдэв:
Evaluation of extraction routes for sulphide concentrates from the processing of complex skarn ores located in the Erzgebirge region – Эрцгебиргийн мужид байрлах иж бүрэн скарн хүдрийн боловсруулалтаас сульфидын баяжмал олборлох замын үнэлгээ

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

Bachelor/Бакалавр
- GMIT Scholarships - МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD Scholarship – Германы эрдмийн солилцооны албаны тэтгэлэг
- DAAD Transnational Scholarship - Германы эрдмийн солилцооны албаны үндэстэн дамнасан тэтгэлэг

Master/Магистр
- ERASMUS scholarship – ЭРАСМУС тэтгэлэг
- DAAD Transnational Scholarship - Германы эрдмийн солилцооны албаны үндэстэн дамнасан тэтгэлэг
- Study completion grant – Төгсөлтийн тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

MIBRAG GmbH, Leipzig, Germany – Мибарг ХХК, ХБНГУ

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

- Basketball league – Сагсан бөмбөгийн лиг
- Technical Olympiad - Техникийн олимпиад

1. 1st place in Startup competition in Student edition – Оюутнуудын дундах гарааны бизнесийн тэмцээний 1-р байр
2. 2nd place in 'Who knows Chemistry well?' Competition - "Химийг хэн сайн мэдэх вэ?" тэмцээний 2-р байр
3. 4th place in Business Case Challenge - Business Case Challenge тэмцээнд 4-р байр

Bachelor thesis topic –Бакалаврын дипломын сэдэв

Simulation of Coal Preparation Plant by using the Simulation Packages "Limn – The Flowsheet Processor" -
"Limn – The Flowsheet Processor" программ хангамжийг ашиглан нүүрс баяжуулах үйлдвэрийн загварчлалыг боловсруулах судалгаа

SHINE-OD MONGOLJIIBUU – МОНГОЛЖИНБУУГИЙН ШИНЭ-ОД

Graduated study program -Төгссөн мэргэжил

Raw Material Process Engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Research Associate at Technische Universität Bergakademie Freiberg - Фрайбергийн Техникийн их сургуульд эрдэм шинжилгээний ажилтан

Completed master study program if available (year, university, study program, thesis topic) – Магистрын зэрэгтэй бол хэзээ аль сургуульд, ямар хөтөлбөрөөр, дипломын сэдэв

International master of science in Advanced Mineral Resources (AMDR) in 2022, (1 semester at university Montan, 3 semesters at TUBAF) – 2022 онд Австри улсын Лөбэн, Герман улсын Фрайбергийн их сургуулиудын хамтарсан "Эрдэс баялгийн дэвшилтэт технологи"-ийн магистрын хөтөлбөрийг төгссөн

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

In order to benefit the design and management of coal preparation plants, several simulation and yield optimization programs have been developed. This concept dictates that all plant circuits be operated at the same quality to maximize the yield of clean coal product. For efficient processes such DMCs (heavy medium cyclones), this constraint can be achieved for all practical purposes by operating all parallel circuits at the same effective RD cut point. The computer model was validated by testing the model results against theoretical plant experience. The wash ability data of the plant feed was used as input to the model and the

value of the observed ash, sulfur and CSN used as quality constraint. The reason why CSN was chosen is that CSN can express the coal quality especially, the coking coal very well.
In general, the simulated results were similar to the theoretical results. It is concluded then, that the model is valid and useful as a tool for predicting plant results for separation above 1.39 SG.
Limn operates within a spreadsheet, it has the major advantage of allowing the user total freedom to create and modify their own models for each unit. Moreover, simulation is necessary to plan new projects or the modification of existing operations. The simulator is easy to use and could readily be expanded to include a wide range of feed materials.
To calculate the predicted yield from a dense medium separation, it is necessary to apply distribution factors from a distribution curve to the raw coal washability data. This presents a problem from two aspects:
- The shape of the curve varies with the SG of the separation;
- The representation of the curve in computer form so that interpolation between known points is possible.

Graduated study program –Төгссөн мэргэжил
Raw materials and process engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
The master study program "Chemical Engineering" at Budapest University of Technology and Economics – Будапештийн техник эдийн засгийн их сургуульд "Химийн инженерчлэл"-ийн магистрын оюутан
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 50%, 3 times - МГТИС-ийн нэрэмжит тэтгэлэг 50% - 3 удаа • GMIT scholarship 100%, 2 times - МГТИС-ийн нэрэмжит тэтгэлэг 100% - 2 удаа
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Copper leaching models and simulation - Зэсийн уусгалтын загвар ба симуляци боловсруулах арга замыг судлах

SUKHBAATAR BATNASAN – БАТНАСАНГИЙН СҮХБААТАР

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

In this thesis we deal with modeling and simulating the copper column leaching. The ore with 2.22% copper grade used in this study. Chalcopyrite (CuF eS2) was main mineral in the test sample. Pyrite (F eS2) was determined as the main gauge mineral of the sample. Three experiments produced with different flow rates which were 5.46l/h/m2, 10.25l/h/m2 and 16.4l/h/m2 with 3g/l sulfuric acid concentration (H2SO4) on column. Thus experiments were continued for 15 days. Thirty experiments produced with different acid concentrations for find right acid concentration for heap leaching. Comprehensive computational fluid dynamic (CFD) 'virtual 3D heap' was used as main model in the modeling and simulation. First prediction of this study was experimental and simulation results would be matched.

From vat leaching experiment, the best acid concentration were 4.5g (Figure 6.2) on heap leaching. We observed that solution flow rate and metal recover were directly depends each other from column leaching experiment. The simulation result was approximately matched with experiment result (Figure 6.8). The average simulaiton error was 0.6% (Table 6.5) which means our simulation was worked correctly.

SUVD–ERDENE TSEND–AYUSH – ЦЭНД–АЮУШИЙН СУВД–ЭРДЭНЭ

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

High-Risk Trainer at Oyu Tolgoi LLC, Underground Project -
Оюу Толгой ХХК, Гүний уурхайн төслийн Өндөр эрсдэлийн сургагч

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- 2018 GMIT Excellent student scholarship – 2018 онд МГТИС-ийн нэрэмжит тэтгэлэг
- 2019 DAAD scholarship for semester abroad student exchange program – 2019 онд Германы эрдмийн солилцооны хөтөлбөрийн оюутан солилцооны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- RWE Power AG, Inden Mine, Germany - RWE Power AG, Инден Майнинг Герман
- Oyu Tolgoi LLC-Environmental Department - Оюу Толгой ХХК, Байгаль орчны алба

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

Selected and worked as a GMIT Education Committee member, Vice president of Student Council – МГТИС-ийн Сургалтын хорооны гишүүн, Оюутны зөвлөлийн дэд ерөнхийлөгчөөр сонгогдон ажиллаж байсан

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Rehabilitation concept for Nalaikh Mining Licence Area (N-MLA): Monitoring of heavy metals in the soils in and around N-MLA
- Налайх дүүргийн ашиглалтын тусгай зөвшөөрөл бүхий уурхайн нөхөн сэргээлт: "Хөрсөнд агуулагдаж буй хүнд металлын хяналт"

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This thesis was focused on the investigation of environmental impacts of Nalaikh small-scale coal mining to identification and improve the mitigation measures and geotechnical recommendations for the rehabilitation concepts and further development of environmental management in Nalaikh district.

To evaluate the soil contamination levels, potential ecological risks, geo-accumulation index and pollution load indexes were estimated by determining and monitoring the concentrations of heavy metals particularly focused on the presence of arsenic in the soils, in and around Nalaikh mining area along the main wind direction from the northwest to southeast (NW-SE) and assessing the contaminated sites within the monitoring part of rehabilitation pyramid, Knippertz, 2005. An estimation of the arsenic content was used to make an interpolation of special distribution in Nalaikh basin, in which 19 sampling points on topsoil were investigated and based on that and the results were compared with the previous study (1). Moreover, by the request from Nalaikh government, 7 soil samples from 5 gardens in Nalaikh ger settlement area were examined and heavy metals content were measured by X-ray fluorescence spectrometry in the field.

In most cases, the content of elements did not exceed the maximum permissible values. However, the concentration of arsenic (As), cobalt (Co) and cadmium (Cd) were above the Mongolian guidelines as well as EU and WHO permissible levels for heavy metals in the soils in which the mean value of As 15.4 mg/kg, Co 138 mg/kg and Cd 11.5 mg/ kg were measured. The highest concentration of arsenic (As) was detected in the nearest sampling point to the mining area with the value of 31.1 mg/kg.

The range of geo-accumulation index was (-0.595 < Igeo < 0.882), indicating that some soils were not polluted and the others not to moderate contaminated by arsenic. In general, the accumulation of arsenic was high near to the mining area than the other areas which has less As when it goes far from the mine and the distribution of arsenic is entering into the settlement area from the mining region and the ash basin from the powerplant.

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

- Metallurgical engineer at Achit Ikht LLC – Ачит Ихт ХХК-д Металлургийн инженер
- Master student in Resources and Technology, GMIT – МГТИС-ийн Байгалийн нөөц, технологийн шинжлэх ухааны магистрын оюутан

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

- 2014-2016, 2018 GMIT Scholarship - 2014-2016, 2018 онд МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD Scholarship 2018 – 2018 онд Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place –
Уйлдвэрлэлийн дадлага хийсэн компани

Inden Mining (RWE) - Инден Майнинг, Eschweiler, Germany - Эшвайлер, Герман

Achievements during the study –
Суралцах хугацаанд гаргасан амжилт

GMIT Basketball League-Golden medal 5 times - МГТИС-ийн болон бусад сагсан бөмбөгийн тэмцээнд оролцож нийтдээ 5 удаа алтан медаль авч байсан.

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Effect of different current densities according to the electrowinning of copper from leach solution - Электролизын аргаар уусмалаас металл зэс гаргаж авахад гүйдлийн нягтаас хамаарах нөлөөллийн судалгаа

TEMUUJIN TUVSHINDELGER – ТҮВШИНДЭЛГЭРИЙН ТЭМҮҮЖИН

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Main purpose of this thesis is to describe effects of cathode copper on the stainless-steel electrode by manipulating the current density of electrowinning on the solution of Achit-Ikht company, which is located in Erdenet. Goals of this research work are determine the copper concentration of solution of Achit Ikht and do experiments on the having different current densities, which vary between 250A/m2 and 360A/m2 of electrolysis.

Moreover, this thesis work contains diversity of knowledge about copper. For example: copper is initially came from Phorphyry ore deposit, copper has very ductile, high non- resistance material and high conductivity properties. These properties makes copper valuable for alloys, modern human life-style and technologies. As well, this reaserch work gives you data of Mongolian and global copper ore deposit and global production.

This thesis work is highly related to Hydrometallurgy specially Electrowinning. Thus, this research gives you advanced knowledge of electrowinning. Furthermore, the thesis work shows setup and procedure of lab-scale Electrowinning process. From the results of experimentation, efficiency was about 90%, recovery and copper deposition is increasing as current density increase.Lastly, I want to express my warm appreciation and thanks to my family, roommates and colleagues for their patience, encouragement, help and support.

Graduated study program –Төгссөн мэргэжил
Mechanical engineering - Механик инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Quality Engineer at Hanwha Q CELLS, LLC, Germany -Герман улсын Ханвха ХХК-д Чанарын инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 100%, 4 times - МГТИС-ийн нэрэмжит тэтгэлэг, 4 удаа • DAAD scholarship 100% - Германы эрдмийн солилцооны албаны тэтгэлэг
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Water hammer in milk of lime distribution pipeline system at Oyu Tolgoi LLC - Шохойн зутан дамжуулах хоолой дахь шингэний цохилтын судалгаа

TURTSETSEG NANJID –
НАНЖИДЫН ТӨРЦЭЦЭГ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The present study is intended to examine the effect of water hammer in milk of lime distribution system at Oyu Tolgoi LLC. The company produces copper concentrate and the flotation process for the copper concentrate production requires slaked lime in order to control pH value. It is essential to prevent system failures because of safety and economic purpose.

Specialized engineering software called "Wanda Engineering 4.5" is used to obtain the realization of the effect of water hammer. It concentrates mostly on reducing the water hammer effect because of the damage it is known to be causing. Wanda Engineering 4.5 is powerful software which can theoretically analyze the transient flow of fluid. Transient flow is originated from the sudden change in velocity of the flowing fluid such as pump trip, valve closure, etc. In this study, only valve closure originated water hammer is studied.

Several factors are known to be affecting water hammer effect and for this study, the type of the valve, the valve closure time duration, and profile, a solid concentration of the lime slurry are the major concerns. The finding of the study shows the sensitivity of the water hammer effect from these factors and the optimum value or pattern for some factors.

It was found that the best method to reduce water hammer is stepwise closure of the valve especially rapid closure at the beginning with gradual closure in the end. In overall closure time of 1 second, the uniform closing causes maximum pressure of ~2.9barg and stepwise closure can reduce it to ~2.2barg at the point right before the valve.

The least pressure inducing valve was the butterfly valve to compare to pinch valve, gate valve, and ball valve. The maximum pressure in 5 seconds of butterfly valve closure was 2.053barg and the steady-state pressure was at the same point was 2.023barg.

ZOLBOO BATSAIKHAN – БАТСАЙХАНЫ ЗОЛБОО

Graduated study program –Төгссөн мэргэжил

Mechanical engineering - Механик инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Robotics Control Engineer, USA – АНУ-д Автоматжуулалтын хяналтын инженер

Completed master study program if available (year, university, study program, thesis topic) – Магистрын зэрэгтэй бол хэзээ аль сургуульд, ямар хөтөлбөрөөр, дипломын сэдэв

University of Hawaii at Manoa, Mechanical Engineering, Tendon-Driven Notched Needle for Robot-Assisted Prostate Interventions, 2022 – 2022 онд Хавайн Маноа Их Сургуулийн Механик инженерийн магистр төгссөн

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT Scholarship - МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD student exchange scholarship - Германы эрдмийн солилцооны хөтөлбөрийн оюутан солилцооны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Wagner Asia LLC - Вагнер Ази ХХК
- Transwest Mongolia LLC - Трансвест Монгол ХХК
- Liebherr-Mining Equipment Colmar SAS – Либхерг майнинг экюпмент колмар САС

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. 2017 Mongolian national mechanical engineering Olympiad, 1st place – 2017 он Монголын үндэсний механик инженерүүдийн олимпиад, 1-р байр
2. 2015-2018 GMIT basketball competition, 1st place - 2015-2018 он МГТИС-ийн Сагсан бөмбөгийн тэмцээнд 1-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Centrifugal slurry pump vibration analyze - Тооцоолол дээр үндэслэн шохойн системийн сайжруулалт

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This bachelor work is a part of the "Slaked lime system" problem developing project and it is aimed to discover and modify a slurry pump overheat problem occurred at Oyu Tolgoi mine. And it is searched for ways to reduce overheating so that the mining operation could have benefit in numerous ways.

The main objective of this work is to analyze vibration of the pumps, as it is experiencing overheating problem in the bearing area. Problem causing roots would be detected and analyzed for optimal solutions. Design modification would be done as one of the result of this research work.

Employers for graduates
Ажил олгогч компанууд

Breaking Barriers, Building Bridges: Class of 2020

Саад бэрхшээлийг эвдэж, боломжийг бий болгоё

ANUDARI NARANBAATAR – НАРАНБААТАРЫН АНУДАРЬ

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering -
Эрдэс баялаг боловсруулалтын инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Metallurgist, Steppe Gold LLC - Степп Гоулд ХХК-д Металлургич

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

Excellent student scholarship
100%, once, 50% 3 times -
МГТИС-ийн нэрэмжит тэтгэлэг
100%, 1 удаа, 50% 3 удаа

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Energy Resources LLC - Энержи Ресурс ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

2019 Awarded GMIT Strategic Research Development Fund (SRDF) – 2019 онд МГТИС-ийн Стратегийн Судалгааны Хөгжлийн Сан (SRDF)-гаас төсөл авсан

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Investigation of Leaching Behaviour of Selected Coal -
Сонгосон нүүрсийг уусган баяжуулах болон түүний баяжигдах чанарыг судлах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This bachelor thesis aimed to study chemical demineralization and desulphurization of selected coal by using various inorganic and organic acids, alkalis, oxidizing agents and their combination to reduce the ash and sulfur content of coal. Throughout the study, chemical enrichment of low-grade coal was an effective method of reducing minerals of low value coal to upgrade into high quality coal.

Currently global development is moving towards a clean energy but coal still plays an important role in producing energy supply worldwide. High quality coal reserves are gradually depleting while cost of the higher quality coal mining is becoming more and more expensive which leads to economic disadvantage. Fortunately, low grade coal reserves are still abundant and could be used as an alternative energy source to minimize the cost. Yet low grade coals are not only having high content of minerals and moisture which gives serious impact on their consumption but also along its usage the formation of unwanted, toxic metals and harmful gases emissions leads into critical environmental issues. Therefore, the purification of low-grade coal using bacteriological, physical or chemical processes becomes extremely important. Physical enrichment methods have very limited effect on the low-grade coals to produce low ash coals. In such low-grade coals chemical enrichment method could reach much higher degree of demineralization due to its effect on the structure of coal. Chemical reagents diffuse inside the carbon matrix through the pores and subsequently dissolve the unwanted minerals.

Similarly, in Mongolia there are abundant coal reserves in several regions but high-grade coals are depleting while low grade coals have high ash, moisture and sulfur content. Especially, the coals that have acceptable coking property but have high content of sulfur and ash are very suitable to be processed by chemical beneficiation method than bacteriological and physical methods.

Mongolia has a huge coal reserve and exports high quality coking coal to China specifically mainly for Chinese steel producers which has great impact on the Mongolian economy. But Mongolian most of the coal exporting companies mine and export the layer with high quality coking coals of the deposit without

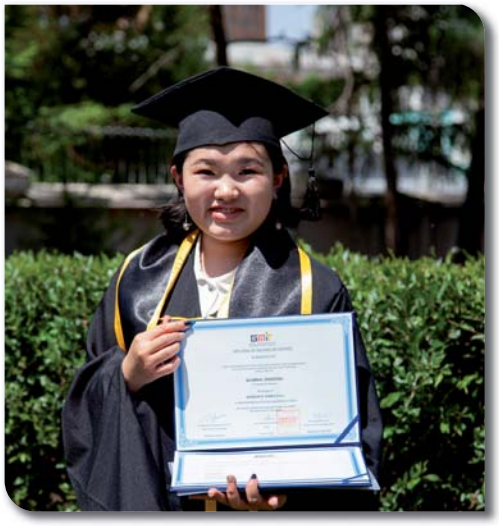
any beneficiation or mixing with the lower grade coals. In later period when the high quality coking coals exhaust, leaving the massive amount of lower quality coals could lead into huge disadvantages due to the inadequate coal quality to be exported.
One of the most suitable method to solve those issue was to increase properties of the low-grade coal into high grade coal by beneficiation methods. Most common beneficiation method in the world is physical beneficiation method such as dense media separations, magnetic separations jigging and froth floatation etc. Physical beneficiation methods are always based on the physical properties of the coal such as mass, size, density and magnetism etc. By those physical beneficiation methods gangues could be separated from coal to a limited extend which result removal of ash content but those methods are less effective due to yield restrictions. Because main focus in every mining company is to have maximum yield at minimum process cost. In this case, chemical beneficiation methods are more effective than physical beneficiation methods. Because in chemical beneficiation methods, accurate separation between mineral components and coals are operated inside of the coals structure.

Main reason behind the wide spread of physical beneficiation is the sufficient knowledge and experience of many years of experts in the field of coal beneficiation plant. While in chemical beneficiation methods, due to the price of the process and other limitations experts started to get interested in the chemical beneficiation methods only around ten years from now on.

In chemical beneficiation methods to maximize the yield of the product at minimum process cost, selection of the exact reagent and chemical that is used for the particular coal deposit is a must. Thus in this thesis study, determination of the reagent and chemical based on the typical of minerals contents in the coal structure is studied due to great significance in the coal chemical beneficiation methods.

Coal with coking property but has high ash content was studied by using seven different chemical agents and alkali-acid leaching had the highest efficiency in removing inorganic minerals from coal matrix. Total 6 different chemical leaching was performed on the samples with 3 different durations with 3 different temperatures and with 2 different concentration of chemicals in 500 ml of glass reactor under ambient pressure.

By chemical beneficiation any desired ash content could be reached when the chemicals adjusted in the most suitable state with temperature, duration and chemical concentration, any desired ash content could be reached.



Graduated study program –Төгссөн мэргэжил
Raw materials and process engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Research development specialist, Explosive manufacturer - Тэсрэх бодисын үйлдвэрт, Судалгаа хөгжлийн мэргэжилтэн
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Assessment of Potential Material Reprocessing of Erdenet Mine Tailings - Эрдэнэт уурхайн хаягдлын далангийн материалыг дахин боловсруулах

AZJARGAL SENGEDORJ – СЭНГЭДОРЖИЙН АЗЖАРГАЛ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The objective of this study is to define possible ways to reprocessing Erdenet mine tailings with potential metal recovery. These tailings have relatively high copper and molybdenum concentration (e.g. tailings III has Cu: 0.2-0.5%, Mo: 0.1-0.2% content), some of which are concerned as reusable deposits. But the measured concentration of metals does not have a homogeneous population over the whole tailings due to settling of the materials, reclamation of process water and drying of the materials, etc. The tailing facility is one of the largest in the world with a total area of 18.6 km2. Over 40 years of history of Erdenet processing plant, the tailing has been collected in the tailing dam and now becomes the biggest resource for research.

The surface samples were taken from 5 different areas with various depths. Furthermore, physical analysis (Size distribution analysis) and chemical analysis (X-ray Fluorescence element analysis) were done.

Based on physical and chemical characteristics, the possible applicable method to reprocessing tailing was investigated. As a result of this study, the possibility of using Erdenet Mine tailings has subjected to technical and economic considerations.

Graduated study program –Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Teacher at the Absolute Elite High School – Абсолют элит дунд сургуульд Багш
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 50%, 2 times - МГТИС-ийн нэрэмжит тэтгэлэг 50%, 2 удаа • DAAD scholarship 100% - Германы эрдмийн солилцооны албаны тэтгэлэг 100%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Plastic in the environment of Nalaikh - Налайхын хүрээлэн буй орчин дахь пластик материалын бохирдол

BAT–ERDENE PUREVSUREN – ПҮРЭВСҮРЭНГИЙН БАТ–ЭРДЭНЭ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Plastic is one of the most produced material in the world due to its flexibility and cheap cost to produce and plastic production has been growing since 1950 and expected to keep on growing. Once plastic product is used and becomes waste plastic becomes problem to the environment. First of all, shear amount of the plastic and plastic accumulation due to slow degradation of plastic and additionally plastic waste causes problems such as entanglement, ingestion, leaching. On top of negative environmental impacts plastic waste is a health hazard as well.

This thesis assesses impact of the plastic waste in Nalaikh by evaluating amount of landfilled plastic waste, recycled plastic waste, plastic waste directly disposed to the environment and impact of different methods to deal with plastic waste trough material flow analysis based on literatures and assumptions. Currently Nalaikh has population of 37608, where majority of the population is living in Ger area. Waste generation pattern is different by a season and during winter majority of the plastic waste is generated by households and during summer majority of the plastic waste is from households and illegal dumping, especially illegal dumping in Terelj national park. Currently it is estimated 610.29 tons of plastic waste is directly disposed to the environment.

Population of Nalaikh is expected to keep on growing and as the population grows amount of plastic waste generated is expected to keep on growing and amount of plastic waste disposed to the environment is expected to grow from 1.72tons/day to 2.55tons/day in 2050. To deal with this problem one measure by itself would not have enough impact and combination of multiple methods is required. If multiple methods are used together including recycling plant in Nalaikh amount of plastic waste disposed to the environment is expected to reduce from 1.72tons/day to 0.54tons/day in 2050 and there is potential to supply plastic recycling plant for next 60 years. With current limited knowledge on plastic waste of Nalaikh further research are highly recommended as Nalaikh is currently under a threat of plastic pollution.

BYERYEKGUL MYEZIMKHAN – МИЗАМХАНЫ БЕРИКГҮЛ

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Studying Joint Master in Sustainable Mineral and Metal Processing Engineering following universities: University of Oulu - Finland, Montauniversität Leoben – Austria, and Universidad Tecnica Federico Santa Maria – Chile. -
Тогтвортой ашигт малтмал, металл боловсруулах инженерийн чиглэлээр Финляндын Оулугийн их сургууль, Австри улсын Монтауниверситэт Леобен, Чили улсын Техникийн Федерико Санта Мариягийн их сургуулийн хамтарсан магистрын оюутан

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- DAAD scholarship - Германы эрдмийн солилцооны албаны тэтгэлэг
- IDB Scholarship, 2015-2019 - 2015-2019 онд Исламын хөгжлийн банкны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

LEAG AG in Germany - Oyu Tolgoi LLC - Оюу Толгой ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

Participated in various Chemistry, Language (German), Olympiads throughout studying period - Суралцах хугацаандаа хими болон Герман хэлний төрөл бүрийн олимпиадад оролцсон.

Bachelor thesis topic –Бакалаврын дипломын сэдэв

Beneficiation Study of Titanium Ore from Selected site in Mongolia - Монгол дах титаны хүдрийн баяжуулалтын судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Within the scope of this bachelor's thesis, the possibilities of enriching titanium minerals from recently discovered Mongolian titanium deposits are investigated. The deposit is estimated 500 million tons, and it has the potential to become 1 billion tons; therefore, it is considered a strategical deposit of Mongolia (from the project report). For this purpose, from the outcrops at the site representative, drilling core samples were delivered to our university. These samples have subjected to mineralogical and chemical analyzes after size reduction, classification, and enriching processes. Mineralogical results were defined by an ore mineral that contains magnetite of 16%, chalcopyrite of 0.2%, and leucoxene of 15%. Ore mineral development sequence is leucoxene–magnetite-chalcopyrite. In the study of enrichment, there was a method high field intensity magnetic separation, gravity separation (shaking table), and flotation experiments were carried out.

Graduated study program –Төгссөн мэргэжил
Industrial engineering - Үйлдвэрлэлийн инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Planner, NBIK LLC – НБИК ХХК-д Төлөвлөлтийн мэргэжилтэн.
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship 50%, 2 times - МГТИС-ийн нэрэмжит тэтгэлэг 50%, 2 удаа
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Coking Coal Market Simulation - Коксжих нүүрсний зах зээлийн симуляци

DUL-ERDENE GANTULGA – ГАНТУЛГЫН ДӨЛ-ЭРДЭНЭ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Coking coal is one of the good Mongolia export. In respect to other export goods, Mongolia is highly dependent on it.

Although this pitch-black rock usage has increased dramatically in globally, especially in China since 2002. Because it is crucial for steel production and China, as a developing country, has a mass steel production, they annually consume over 50 percent of global coking coal usage. Because of that China has one of the largest coking coal markets. Mongolia, as a neighboring country to China, became one of the suppliers for the Chinese coking coal import market. Even though Mongolia is dominant in that market, it is still a very fragile network with many strong factors that can influence our current status moreover it could impact our economy. So it is critical to have a wise strategy to fit in this market.

To predict an optimal strategic decision, the game-theoretic approach may be applied.

In recent years, some research regarding game-theoretic model implication on the international commodity trade has done. However, there is no study considering implication on China's coking coal import market especially, including Mongolian coking coal export. So it became necessary to determine if the models are suitable and applicable to the market. To know the applicability of the game-theoretical model to China's metallurgical market, a market study and analysis for Mongolia conducted regarding coking coal.

Unfortunately, it was impossible to predict an optimal strategic decision for Mongolian coking coal export to China's coking coal import market. Because of a lack of data. During the research, most of the data was not accessible and not transparent.

Even though the game-theoretical model was not used, a market outlook for Mongolian coking coal export has done. Although a possible augmentation for the selected game- theoretical model has proposed in this paper.

Graduated study program –Төгссөн мэргэжил
Raw materials and process engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Plant metallurgist at Boroo Gold LLC – Бороо Голд ХХК-д Боловсруулах үйлдвэрийн металлургич
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship 50%, 3 times - МГТИС-ийн нэрэмжит тэтгэлэг 50%, 3 удаа
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Copper ore Leaching with alternative agents - Уламжлалт бус урвалжаар зэсийн хүдрийг уусгах судалгаа

GALSANJAMTS OTGONBAATAR – ОТГОНБААТАРЫН ГАЛСАНЖАМЦ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

In copper processing, copper bearing sulfide minerals in porphyry deposit that can be efficiently processed by the froth-flotation cells then recovered by smelter. Copper mainly occurs in porphyry deposit with gold, silver and molybdenum. Most currently, research interest has moved to the processing low-grade, oxidized, complex ore bodies and flotation tail from copper processing that contains impurities including silica, iron, arsenic which forms the crud which negatively influence downstream processes like solvent extraction of hydrometallurgical plant.

The conventional sulfuric acid for leaching low-grade copper oxidized ores is inefficient in the treatment of the proposed ore contains gangue metals and minerals like iron, silica, aluminum and carbonates results in increased reagent consumption and increased operating costs. In addition to these technical challenges, the use of sulfuric acid impacts on environment negatively including vaporization and contamination of ground water.

Nowadays, in Mongolia the metallurgical plants like 'Achit-Ikht' LLC recover cathode copper by using heap leaching based on diluted sulfuric acid from cut-off grade Cu-Mo ores. Sulfuric acid is very reactive and corrosive. It is soluble in water and ethyl alcohol. Its strong reactivity may ignite organic material. Sulfuric acid will exist as particles or droplets in the air if released to the atmosphere. It has moderate chronic toxicity to aquatic life which has been reported to form stable complexes with copper, iron and other silicate materials. Glycine is a non-toxic, stable, environmentally benign reagent which has been reported to form stable complexes with copper and gold. Also, it is available in bulk industrial quantities. Somehow, using sulfuric acid in industrial scale is harmful for the environment. So, in the research the opportunities to replace the conventional reagent by the new reagent like alkaline glycine solution for reducing toxicity to environment and reducing leach stream recycling cost.

In this research, glycine will be investigated as a potential lixiviant for low grade Cu-Mo ores at alkaline pH. And conventional leaching reagent like diluted sulfuric acid will be studied as reference for comparing metallurgical results with glycine system. Although alkaline glycine solutions have been reported to selectively leach copper over gold from a copper-gold ore, the leaching behavior of the copper ore which is assumed as cut-off grade ore for flotation process (called 2nd dump of Erdenet mining company) in alkaline glycine solutions would be investigated.

In Mongolia, cut-off grade ores have not been leached in the proposed lixiviant system as glycine leaching system in order to establish the influence of process variables on copper. Furthermore, lack of data has been published on the recovery of copper from alkaline glycine leach system on oxidized cut-off grade ore. Due

to corona crisis, this research will present potential results of leaching behavior tests from assumptions by help of the literatures.
Using an alkaline glycine solution, has initiated significant interest in using the new technology in various environments such as in situ, dump, heap, vat and agitated tank leaching. That is why, in plan of the research, low-grade copper ore of the 2nd dump of Erdenet mining company will be leached in column leaching and bottle roll under ambient conditions at laboratory scale. Also, the experiments in various conditions will be carried out under various parameters with oxidant as hydrogen peroxide such as various pH values, glycine concentrations and flow rates etc. On the literature noted that copper-gold ores leaching in alkaline glycine solution revealed that, Cu and Au simultaneously leach from both ore types. However, Cu leaches faster than gold. In this research, the literatures revealed that, with the exception of copper oxide minerals leach more rapidly than their sulfide counterparts.
Copper extractions from low-grade copper ore were 25 %, 31.8 %, 36.18 % after 72 hours at initial concentration of glycine 2 Gly : 1 Cu, 4 Gly : 1 Cu, 8 Gly : 1 Cu molar ratios respectively in 500 ml leach solution. After 72 hours, the result of sulfuric acid-based bottle roll test was 61.8 % of Cu was extracted in initial concentration of sulfuric acid with molar ratio of sulfuric acid to pure copper is equal to 2:1. The heap leaching behavior tests results are assumed directly from literatures. For example, 0.5 M concentration of glycine was used in column leaching test on flotation tail from copper-gold processing, the flow rate of leach solution was 0.86 L / h. The result showed that 53.6 % of copper was extracted after 48 days of column glycine leaching test. 3 g / L diluted sulfuric acid was used in another column leaching test on oxidized low-grade copper ore, the flow rates of the leach solution were 0.906 L / h, 2.724 L /h and 1.702 L / h. The result showed that the test with highest flow rate had the highest metal extraction 40 % after only 15 days. Also, the test with the lowest flow rate showed the lowest metal extraction with 28 % of Cu after 15 days.

All in all, the leaching behavior of various glycine-based and sulfuric-acid-based systems will be reviewed, followed by metal extraction over time where economics merit. The result of research will be revealed that advantages and disadvantages of each leaching systems that is based on comparison of economic merit, metallurgical results and environmental effects.

GENDEN BATSUKH – БАТСҮХИЙН ГЭНДЭН

Graduated study program –Төгссөн мэргэжил

Mechanical engineering -
Механик инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

A specialist in the supervision of wide transport machinery at Khutul Basement - Хөтөл Цемент Шохой ТӨХК-д Өргөн тээвэрлэх машин механизмын хяналт хариуцсан мэргэжилтэн

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

Khutul Basement scholarship 5 years – Хөтөл Цемент Шохой ТӨХК -ийн тэтгэлэг – 5 жил

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Transwest Mongolia LLC - Трансвест Монголиа ХХК
- Khutul Basement -Хөтөл Цемент Шохой ТӨХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. Participated in National Physics Olympiad Улсын физикийн олимпиадад оролцож байсан.
2. Golden medal of GMIT Automatic Robot – Football section (3 times) - Автомат Робот" тэмцээний "Робот хөлбөмбөг" төрөлд МГТИС-ийн "Eternal engine" багаараа 3 жил дараалан түрүүлсэн.

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Crane wire rope oscillation and Swinging Reduction -
Краны ачааны савлалтыг бууруулах боломжийн судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This thesis work aimed to design control method for RT105 boom truck working at OT mining site. The main methods of controlling the payload swing induced by the crane are input shaping, feedback control and optimal trajectory. In this thesis, each of mentioned methods will be explained with their advantages and disadvantages. Literature review of using those methods were also mentioned in the chapter 2, such as crane oscillation control, mobile boom crane and advanced input shaping control and paper containing controlling progress of the payload induced by the crane and other external disturbances.

JANTSANNYAMBUU JAMIYANDORJ – ЖАМЪЯАНДОРЖИЙН ЖАНЦАННЯМБУУ

Graduated study program –Төгссөн мэргэжил
Industrial Engineering - Үйлдвэрлэлийн инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Maintenance planner at Khishig Arvin Industrial LLC – Хишиг Арвин Индустриал ХХК-д Засвар төлөвлөлтийн инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 50% - МГТИС-ийн нэрэмжит тэтгэлэг 50% • GMIT scholarship 100% - МГТИС-ийн нэрэмжит тэтгэлэг 100%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Mining Sector Contribution to the Efficiency and Effectiveness of the Local Development Fund: A Case Study of Zaamar district, Mongolia - Орон нутгийн хөгжлийн сангийн үр ашиг болон үр нөлөөг дээшлүүлэхэд уул уурхайн салбарын хувь нэмэр: Монгол улсын Заамар сумын нөхцөл байдлын судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The main goal of this thesis is to study the effectiveness and efficiency of the Local Development Fund in Zaamar soum, with special focus on the interaction between the local government and the local community. The purpose of the LDF is to create conditions for a transparent and accountable governance by collective decisions with the participation of citizens and the local governor. During the research, unexpected feature was Zaamar soum had their own unique fund which called Development Support Fund.Both LDF and DSF were analyzed and suggestions were conducted in the thesis.

Moreover, optimization of public spending was created in order to improve current utilization.

Graduated study program –Төгссөн мэргэжил
Raw Material and Process Engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Gas measurement specialist at Methane Gas Resource LLC Метан Газ Ресурс ХХК-д Хий хэмжилтийн мэргэжилтэн
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship 100% - МГТИС-ийн нэрэмжит тэтгэлэг 100%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Lithium Reserves and Resources in Mongolia and their Exploitation - Монгол орны литийн нөөц баялаг болон тэдгээрийн ашиглалт

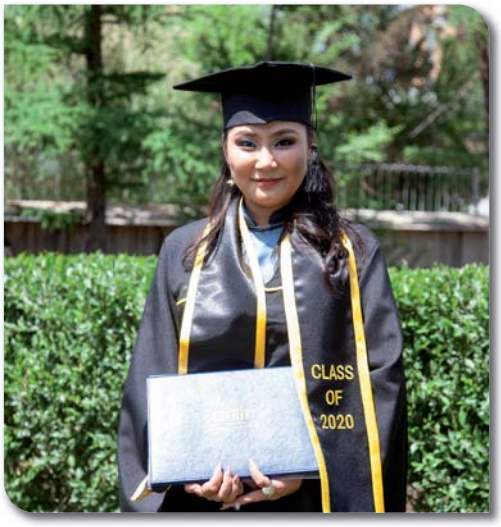
MUNKHJIN GANTULGA – ГАНТУЛГЫН МӨНХЖИН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

In recent years, lithium demand is drastically increasing and it is said to be becoming a new oil due to increasing number of electrical vehicles. This light-weight, highly reactive metal is able to store relatively high electrical energy in its chemical bonds and it is widely used in electrical and electronics industry as a rechargeable battery. Studies show that increasing number of electrical vehicles might set demand of lithium to 1’000’000t by 2025.

Lithium is spread all over the world, but in trace concentration. However, several types of deposits hold economical value. These types of deposits are brines, pegmatites and clays. Brines are salt lakes where lithium is dissolved within the water. Its lithium extraction is relatively simple and inexpensive. Pegmatite deposits require energy intensive, complex processes. Operating cost of hard rock mines of lithium can be twice the operating cost of brine mines due to beneficiation and extraction processes. But, brines possess greater environmental risks like leakage.

Mongolia has currently 4 economically feasible hard-rock, pegmatite deposits that are under exploration and planning phase. These are Huh Dely deposit, Munkhtyn Tsagaan Durvuljin deposit, Eguzer deposit, and Bear Mountain deposit in Dundgobi and Sukhbaatar province. Unfortunately, Mongolia does not have brine deposits. Since, lithium mine is considered to be the least harmful mine, and deposits’ locations are ideally located to the infrasturcture; engineering, economic, political, societal, psychological, and ecological aspects of feasibility have great expectations. Due to increasing demand for lithium-ion batteries for electrical vehicles, lithium price is expected to exceed $10000/t lithium carbonate within next five years.



Graduated study program –Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Scheduler in the training department at Oyu Tolgoi Underground Mining – Оюу Толгой Гүний уурхайн Сургалтын албанд Хуваарь гаргагч
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Study of wastewater treatment based on the DAF for the small-scaled industry - Жижиг үйлдвэрийн хаягдал усны агаар уусган хөвүүлэх аргаар цэвэрлэх судалгаа

NANDIN–ERDENE MUNKHBAT – МӨНХБАТЫН НАНДИН–ЭРДЭНЭ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Most of the Mongolia industry scale is small sized industry comparing other country. Therefore, there is an important need of small-scale pre-treatment plant of industrial wastewater in Mongolia. As nowadays requirement for protecting environment, all small-scale industry have to install WINTP before discharge the wastewater into environment and sewerage network. The wastewater treatment plant at a poultry slaughterhouse comprises a dissolved air flotation (DAF) system. The DAF system at small-scale industries especially poultry wastewater treatment is designed to remove high concentration of organic pollution such as FOG, BOD, COD and TSS. Formulated on the literature, the DAF operation of the system removal efficiency at 300kPa pressure, PAC coagulation and anionic polymer is shown optimal result.

The design of the DAF system surface area is 6.48 m^2, length is 3.6 m, width is 1.8 m and depth is 1.6m based on water consumption and flow rate of the industry. The Ajigana LLC is capacity of producing 1 million chicken in a year and it consumes 42247.5 m^3 water and 1 15.45m^3 water per hour.

NAURYZBYEK BYEKYETKHAN – БЕКЕТХАНЫ НАУРЫЗБЕК

Graduated study program –Төгссөн мэргэжил

Mechanical engineering -
Механик инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Mine Mobile Equipment Reliability Engineer at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Гүний уурхайн Хөдөлгөөнт тоног төхөөрөмжийн Найдвартай ажиллагааны инженер

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

IDB scholarship, 2016-2019 - 2016-2019 онд Исламын хөгжлийн банкны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Vensys Energy AG, Germany - Венсис Энержи, Герман
- Mera LLC - МЕРА ХХК
- Wagner Asia Equipment LLC - Вагнер Ази ХХК
- Darkhan VETC - Дархан-Уул аймаг дахь Политехник коллеж

Achievements during the study – Суралцах хугацаанд гаргасан амжилт (Competition, Olympiads, /тэмцээн, олимпиад гэх мэт – 100 үгэнд багтааж жагсааж бичих)

1. "Real-time volumetric measurement of grinding media of SAG mill" organized by Oyu Tolgoi LLC in 2019-2020 - 2019-2020 онд Оюу Толгой ХХК-аас зохион байгуулсан "ХӨНТ-ийн нунтаглах материалын бодит цагийн эзэлхүүний хэмжилт
2. "Plastic Construction" organized by Young Sustainable Development Leaders program 2019 – 2019 онд Тогтвортой хөгжлийн залуу манлайлагч хөтөлбөрөөс зохион байгуулсан "Хуванцар барилга
3. "Green Development" at GMIT, 2018 – 2018 онд МГТИС-ийн "Ногоон хөгжил"
4. Won third place "Chess Tournament" at GMIT 2019 – 2019 онд МГТИС-д "Шатрын тэмцээн"-д гуравдугаар байр эзэлсэн

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Real-time volumetric measurement of grinding media of SAG mill – ХӨН (хагас өөрөө нунтаглагч) тээрмийн бөөрөнцөг дүүргэлтийг онлайнаар хэмжих үйлдвэрийн загварчлалыг боловсруулах судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This research work aimed to investigate the "Real-time volumetric measurement of grinding media of semi-autogenous (SAG) mill" by using an online-based model. Oyu Tolgoi (OT) mine copper concentrator is located in South Gobi province, south part of Mongolia. SAG mills are often taken as the object of optimization studies because they are a type of equipment that consumes large amounts of energy. Its size reduction stage includes one primary crusher which feeds two SAG mills (11.58m diameter x 7m length) with the following three ball mills (7.32m diameter x 11.32m length). After sag mill, comminuted products pass through a trommel screen in which over and undersize materials its oversize part is circulated into SAG mill and undersize part is conveyed to hydro-cyclone to further process.

The primary objective of this research is to discover viable measurement methods to determine an online ball charge level. Ball filling observation was implemented in this work using the mill's load sampling and power draw. These methods could estimate ball filling variation with easy, undeniable, and based on available data at OT mine. We have estimated the correlation coefficient of power-draw and SAG load because it has a remarked relevance than other parameters.

Afterward, to find more accurate dependency, at different conditions correlation coefficient is estimated.

The result obtained from this work show, the ball filling percentage variation is between 5 tons 25 tons

which is quite well values according to the designed conditions. Besides, these ranges also classified three ranges based on the correlation determination value of R-squared value.

NOMUUN BATBAATAR – БАТБААТАРЫН НОМУУН

Graduated study program –Төгссөн мэргэжил
Environmental Engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Data Analyst - Мэдээллийн шинжээч
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT Scholarship - МГТИС-ийн нэрэмжит тэтгэлэг • DAAD Sur Place scholarship - Германы эрдмийн солилцооны албаны Sur Place тэтгэлэг
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
• Oyu Tolgoi - Оюу Толгой ХХК • Ukhaa Khudag LLC - Ухаа Худаг ХХК
Achievements during the study – Суралцах хугацаанд гаргасан амжилт
NUM annual Chemistry Competition as team, 1st place, 2018 – 2018 онд МУИС-ийн жил бүр зохиогддог Химийн уралдаанд багаараа 1-р байр
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Assessment of PM 2.5 Air Quality of Nalaikh District - Налайх дүүргийн PM2.5 агаарыг чанарыг үнэлгээ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The Nalaikh district of Ulaanbaatar city is an old mining city with population of 35000 and is one of the remote districts of the capital of Mongolia. Similar to Ulaanbaatar, the Nalaikh district is highly polluted during winter season, where the main pollution source is household stoves in both areas.

In this thesis PM2.5 air quality of Central Nalaikh was assessed based on 2017-2019 PM2.5 measured data collected at GMIT. Meteorology parameters were assessed first time for Nalaikh district based on data collected from meteorology station installed at GMIT, from years 2017 to 2019. Yearly, Monthly and daily time series of PM2.5 pollutions were described in the thesis.

PM2.5 pollution has seasonal character, increasing in the cold season and decreasing in warmer seasons. Yearly average concentration in the central Nalaikh was 60-352 μg/m3, which is exceeding of the Mongolian standard by 2.4-14 times and the WHO guidelines by and 6-35 times. Some measurements were done at the 1st khoroo site of Nalaikh district as representative of most polluted area for comparison and PM2.5 pollution level was exceeding the daily exposure standard of Mongolia by 18 times and of WHO guidelines by 36 times, reaching daily average PM2.5 of 952 μg/m3 and 30-minute average of 2580 μg/m3 in the measurement taken on 17th to 18th of December 2019.

Elemental analysis was done on more than 20 samples collected on 37mm Polycarbonate Nuclear Pore Membrane filters with pore size of 0.4um and XRF analysis was done by the Nuclear Research Center, National University of Mongolia. According to the results of analysis, heavy and toxic elements were below the Mongolian and International standard. However, Cadmium concentration was found to be much higher than EU standard and should be investigated in the future for safety purposes.

Air quality control measures are recommended to the district government, including relocation of the current waste disposal of Nalaikh due to wind direction from the area to central Nalaikh is considered unsafe as it is transporting dangerous pollutants through air. This South-West direction of wind is specifically high during morning time, when people are in the streets on the way to kindergarten, school and offices.

Graduated study program –Төгссөн мэргэжил
Environmental Engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Master study program in sustainable development, Nagoya University, Japan – Япон улсын Нагояагийн их сургуульд тогтвортой хөгжлийн магистрын оюутан
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship 50% - МГТИС-ийн нэрэмжит тэтгэлэг 50%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
The Investigation of Settling Processes for Tailing Thickener in Oyu Tolgoi - Оюу Толгой үйлдвэрийн хаягдал өтгөрүүлэгчийн тунгаах ажиллагааг судлах нь

OTGONZUL BAT–ERDENE – БАТ–ЭРДЭНИЙН ОТГОНЗУЛ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This bachelor thesis based on the research work of Oyu Tolgoi (OT) LLC that to solve problem which is generating a scale in riser pipe of tailing thickener during settling processes. OT concentrator plant is reused the water from the tailing thickener and recycling water is more than 80 %. Tailing thickener plays main role as produce clarified effluent and it is used for reuse water in processing plant. Performance of tailing thickener is most considerable issue and their settling is the first step in the utilization of tailings; thus, it is very important to determine their settling behavior. The aim of this study was to investigate the parameters that aspect settling behavior of tailings solution with different conditions. This thesis presents the results of a study conducted on settling processes of copper mineral tailings. Moreover, the following goals will be expected, investigate the tailing solution charecteristics, make assumption the scale formation causes on the case and suggest scaling removal and preventing environmental way.

Graduated study program –Төгссөн мэргэжил
Industrial engineering - Үйлдвэрлэлийн инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Producer at John Sheepskin – Жон Шийпскин-д Продюсер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 100%, twice - МГТИС-ийн нэрэмжит тэтгэлэг 100%, 2 удаа • GMIT scholarship 50%, twice - МГТИС-ийн нэрэмжит тэтгэлэг 50%, 2 удаа
Bachelor thesis topic –Бакалаврын дипломын сэдэв
Optimization of Project Cost Estimation to Minimize Risk: A Case Study - Эрсдлийг багасгах үүднээс төслийн өртгийн тооцоололтыг сайжруулах арга зүй, судалгаа

TSEVEENDORJ GAN–ERDENE – ГАН–ЭРДЭНИЙН ЦЭВЭЭНДОРЖ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

With the rapid development of technology in the 20th and 21st century, the breadth and depth of development in most sectors have increased exponentially. As a result, organizations have shifted towards a project-oriented structure for their operations. Today projects are implemented in specific steps which govern the outcome. In the initiation and planning phase, complete characterization of the project is written and possible risks that are associated with the project are analyzed. Effective projects have proper assessment of their capabilities and plan their resources accordingly. While the amount of research done is most often correlated with the success of the project, there are still many unknown factors and changes to be made later in the life cycle of a project. Thus, it is beneficial to investigate the initial design stage of a project and research methods to improve the quality of assessment made during this time so that it has the least amount of effect on the planned process during implementation. During the planning phase of projects, one key area of research is that of cost estimation. Cost estimation is a process that strongly influences the later phases of a project. A properly done cost estimation is a concrete way of avoiding pitfalls and minimizing risk in the future. Thus, the goal of this thesis is to investigate the optimization of project cost estimation in the initial stages to minimize risk later in the lifecycle of the project, utilizing the Square One case study.

TUMENDELGER BATSUURI – БАТСУУРИЙН ТҮМЭНДЭЛГЭР

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering -Механик инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Integrated Solutions Engineer at Weir Minerals Mongolia LLC – Вэйр Минералс Монголиа ХХК-д Цогц хөгжлийн шийдлийн инженер

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- Excellent Student Scholarship, 2016, 2017, 2020 - 2016, 2017, 2020 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- DAAD SurPlace Scholarship, 2017, 2020 - 2017, 2020 онд Германы эрдмийн солилцооны албаны SurPlace тэтгэлэг
- DAAD semester abroad study scholarship - Германы эрдмийн солилцооны албаны "Оюутан солилцооны тэтгэлэг".

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

RWE Power AG, Hambach Open Pit Mine, Niederzier, Germanyerzier - RWE Power AG, Хамбах ил уурхай

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Ulaanbaatar, Mongolia Start-Up Weekend Uni-Edition Solar Cooker, 3rd Place, Oct 2016 - 2016 оны 10 сард, Start-Up Weekend Uni-Edition нарны зуух, 3-р байр
2. Ulaanbaatar, Mongolia GMIT Student Symposium Using Titanium Dioxide as a Photoelectrode of Dye-Sensitized Solar Cell, 1st Place, May 2017 - 2017 оны 5-р сард, Улаанбаатар, Монгол Улс, МГТИС-ийн оюутны бага хурлаас Титаны давхар ислийг будагч бодист мэдрэмтгий нарны зайн фотоэлектрод болгон ашиглах сэдвээр 1-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Cutting tool parameter optimization of mechanical excavators - Малтлагын машины параметрийн оновчлох.

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Recently, the demand for developing new approaches to the use of mechanical excavators in underground mine is still increasing due to its many advantages over conventional drill and blast excavation method. For example, they have better reliability in terms of safety, high productivity and compatibility with automation as well as being environmentally friendly. Most importantly, mechanical excavators allow for continuous and selective mining. But the cutting tool of the mechanical excavators tend to be worn easily.

The fundamental aspects for the improvement of mechanical excavation are the rock properties, the cutting parameters and the cutting tools. Thus, research studies are mainly divided into the development of -tool materials, -cutting techniques and – alternative methods to weaken the rock mass. [3] Improvement for the cutting technique is still in demand since previous studies are mainly focused on the other aspects.

The undercutting technique had to be studied further since it leads to lower specific energy consumption, lower mean penetration force and higher coarse fraction. These are all desirable for the mechanical excavations, because the lower specific energy results in a low energy cost and the lower mean penetration force allows light-weight design. [4] The higher coarse fraction is also desirable in terms of the fine dust pollution in the worksite. However, the undercutting technique also forms a stronger bending load with the higher peak forces which can lead to a preliminary failure of the point attack pick. Thus, main goal of the thesis work is determined to optimize undercutting parameters of point attack pick.

The four main parameters of the undercutting are depth of cut, spacing between cuts, attack angle and swivel angle. These parameters are optimized by considering four dependent variables including the specific energy consumption, the mean cutting force, the mean penetration force and the peak cutting force which all have significant influence on the design of the mechanical excavators.

An experimental study is performed to obtain force measurement during the rock being cut. The undercutting parameters are arranged in 15 different combinations and rock cutting experiments are conducted with three different rocks including Granite Hartberg, Baltic Brown and Marble Carrara. With the experimental data the specific energy consumption is calculated. It is modelled as the 2nd degree polynomial function of two independent variables (depth of cut and spacing between cut) and as 1st degree polynomial function of swivel- and attack angle. As a result, the optimum parameter region is determined qualitatively.

ULZIIKHUU OTGONBAYAR – ОТГОНБАЯРЫН ӨЛЗИЙХҮҮ

Graduated study program –Төгссөн мэргэжил

Raw materials and process engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

The international Master of Science in sustainable and innovative natural resource management in INEMET, 2022 – 2022 онд ИНЭМЭТ-ийг Байгалийн нөөцийн тогтвортой, шинэлэг менежментийн чиглэлээр олон улсын шинжлэх ухааны магистр төгссөн

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship 100%, three times - МГТИС-ийн нэрэмжит тэтгэлэг 100%, 3 удаа
- DAAD scholarship, twice - Германы эрдмийн солилцооны албаны тэтгэлэг, 2 удаа

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Separation and recovery of platinum group from chloride solutions by solvent extraction - Хлоридын уусмалаас цагаан алтны бүлгийн металыг уусган хандлах аргаар салгах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Copper electrorefining is the purification process where anode slabs with around 98% copper content are introduced and dissolved in electrolyte solution to produce cathodes that contains 99.99% pure copper through re-deposition. Major amount of copper is produced through this process. In 2015, total 23 million tons of copper have been refined, in which 18.9 million tons of copper was produced by electrorefining process, and the amount of electrowon copper was 4 million tons.

For the production process, it is very efficient and less energy intensive when the current density is high. However, when the current density is high, electrodeposition of copper generates cathode copper with lot of irregularities, such as needles and nodules.

Uneven and irregular surfaces of copper can be avoided with presence of additives in the electrolyte solution. Glue is a leveling agent used for electrorefining process, and it is considered the most effective and strongest additive of all. Glue acts as a resistance barrier on the cathode surface and it greatly influence electrodeposition. Long chain of protein molecules of glue are attracted to the negatively charged cathode. Since glue molecules are positively charged in solution, they are selectively adsorbed on the areas where the field strength is high. Such locations are edges, nodules and needles on the cathode surface. The adsorption of glue takes place at these areas by minimizing needles, edges and dendrites, therefore, purer cathode copper with smoother and denser surface can be obtained.

Both low dosage and over dosage of glue result insufficient quality of electrodeposition. As a common experience, glue is mostly added excessively than deficiently dosing. A big drawback of over dosing is that glue increases the polarization resulting high voltage of a cell. When the quantification of glue is accurately measured and maintained, energy consumption can be diminished significantly.

Glue consists of a mixture of various protein molecules, so that the chemistry of glue is complex. This feature of the glue makes the chemical analysis very complicated. A conventional chemical analysis can take about 48 hours. Unfortunately, electrorefining is continuous process, the glue concentration must be monitored and controlled in simultaneously.

Based on glue impact on polarization of cathode, electrochemical methods of measuring glue concentration in electrolyte has been actively researched and developed in past. Modern electrorefining plants mainly use galvanostatic method for measurement, in which potential time response is measured as the current is constant. Although this method was formerly known as reliable and less costly, the preparation of the work, the calibration, and calculation processes are very time consuming and repeated many times.

Therefore, simple and accurate measuring methods must be investigated and studied for electrorefining plants in the future for a better performance. This thesis mainly focused on electrochemical techniques that used to study glue behavior in electrolyte.

Furthermore, glue changes the electrodeposition of cathode by changing their morphological behavior and kinetics of the crystal growth. To determine glue effects on electrodeposition, instantaneous nucleation and progressive nucleation mechanisms of copper have been studied in this work.

Synthetic electrolyte solutions have been prepared, and cyclic voltammetry, chronoamperometry, differential pulsed voltammetry techniques have been performed to investigate how glue affects the electrodeposition in electrolyte solution. The main characteristic of these methods is that potentiostatic approach gives a distinctive opportunity to measure the change of current density while the potential between a working and reference electrode is kept constant. As a result, this method enables us to study cathodic behavior of a cell.

ULZIITOGTOKH ALTAN–ULZII – АЛТАН–ӨЛЗИЙГИЙН ӨЛЗИЙТОГТОХ

Graduated study program –Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Master study program in Environmental study at NUM – МУИС-д хүрээлэн буй орчин судлалаар магистрын хөтөлбөрт суралцаж байна.
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 50%, once - МГТИС-ийн нэрэмжит тэтгэлэг 50%, 1 удаа • DAAD scholarship, twice - Германы эрдмийн солилцооны албаны тэтгэлэг, 2 удаа
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Environmental aspects of Electric mobility: The case study on Copper - Зэс ангижруулах электролизийн уусмал дах цавуулаг бодисын хэмжээг электрохимийн аргаар тодорхойлох нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The current state of climate change and global warming calls for immediate action from any industry that can show a considerable benefit for it, especially the electric mobility industry, which can erase the pollution caused by internal combustion engine industries. However, it can be vary depending on several factors, including electricity source, a variation of an electric propulsion system of EVs, material footprint, and geographical region. Reliable research about far-reaching environmental impacts only due to the electromobility is of utmost importance. Copper is one of the priority elements that are essential to electromobility technology. While copper is used throughout electric vehicles, charging stations, and supporting infrastructure because of the metal's durability, high conductivity, and efficiency, it has a tremendous impact on the environment regarding CO2 loading.

In this study, the ways of dealing with the environmental aspect of electromobility concerning copper are discussed. First of all, the changes in the copper demand due to the drastic growth of the electric vehicle is estimated. Furthermore, which fraction of the environmental footprints generated from a copper production is consumed in the EV industry alone is estimated.

Consequently, the study shows that the global copper supply market and world copper will meet this demand for up to 200 years, although copper consumption will increase as demand for EVs intensifies. One of the major solutions to reduce the environmental footprints of copper production is to support and fund copper recycling through government policies.

As a result, it concluded that copper demand, which is caused due to EVs, would reach 3,494Mt out of 47, 094Mt by 2035. This is accounted for 7,42% of the total copper demand in 2035. There are no issues that will arise because of electric vehicles unless specific supply chain problems occur due to economic aspects such as lack of smelter capacity of copper. However, the electric vehicle field can have a massive impact on the production and resource of some particular raw materials, in the copper world.

UNENBAT GANBAYAR – ГАНБАЯРЫН ҮНЭНБАТ

Graduated study program –Төгссөн мэргэжил

Industrial Engineering
Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Supply Chain Senior Manager at New Sever LLC
Нью Север ХХК-д Хангамжийн ахлах менежер

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship, 5 times - МГТИС-ийн нэрэмжит тэтгэлэг 5 удаа
- DAAD scholarship - Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

Transwest LLC - Трансвест ХХК
New Sever LLC - Нью север ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

3rd place at student symposium - Оюутны бага хурал- 3-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Optimization of the marketing strategy for LECA - Кирамзитан дулаалгын материалын маркетингийн стратегийг оновчтой болгох нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Mongolia has a trade surplus. In the construction materials sector, most products are also imported. Because the majority of the products sold in the market are imported, our domestic manufacturers are greatly affected. The main reason being, these imported products are much cheaper, have better quality and are well known to the public. The time has come for our national manufacturers to put greater emphasis on their marketing strategy and support the domestic manufacturers.

This thesis work aims to shed light to LECA insulating material manufacturers marketing challenges of Mongolian companies to compete with imported products. First of all, a study was conducted to confirm the market capacity. We have developed this marketing plan as a result of studying both the seller and the buyer. So, there are two principal paths. Increase sales points in the capital city and local areas, regularly advertise the advantages of our product, measure and advise on heat loss, and teach how to use our own products using different modern marketing tools. Within the macro-market the following marketing strategies should be followed, promote the advantages of LECA insulation, obtain support from government agencies in accordance with the law, and participate in tenders and projects announced by state-owned joint stock companies and private enterprises.

In this thesis we used qualitative research methods in the form of text analysis, interpretation and interviews. We conducted market research interviews with business-to-business customers and individuals to provide insights into the aforementioned markets and goods. The finals result of this thesis work will further become the base marketing strategy of the Newsever.

UURIINTUYA UNENBAT – ҮНЭНБАТЫН ҮҮРИЙНТУЯА

Graduated study program –Төгссөн мэргэжил

Industrial Engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Planner at Khan Altai Resource LLC - Хан Алтай Ресурс ХХК-д Төлөвлөгч

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

Excellent student scholarship, 2017, 2020 - 2017, 2020 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- MAK LLC - MAK ХХК
- Energy Resource LLC - Энержи Ресурс ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

- Nalaikh District Art Champion, 2020 – 2020 онд Налайх дүүргийн уран илтгэлийн аварга
- Eco-Friendly Product Design Student Symposium 3rd Place - Байгальд ээлтэй бүтээгдэхүүн загварчлах оюутны симпосиум 3-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

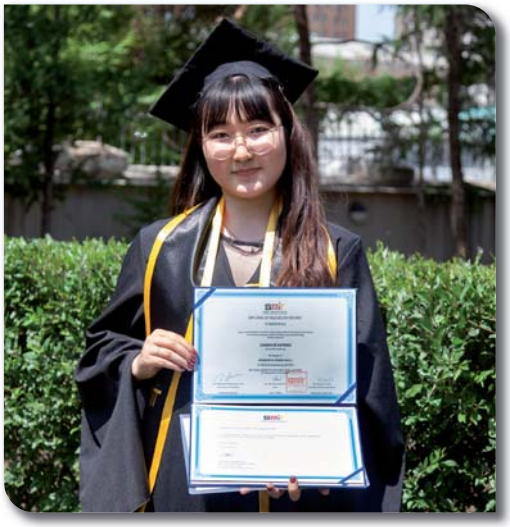
Molybdenum Disulfide based lubricant and its market in Mongolia - MoS2-т суурилсан тосолгооны бүтээгдэхүүн ба түүний Монгол дахь зах зээл

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The purpose of this study was to determine the current solid and semi-solid lubricant market in Mongolia and to develop a business model canvas of the production of Molybdenum disulfide based solid, and semi-solid lubricant material. The key question was If there is a demand for a solid lubricant, how a Molybdenum disulfide based solid and semi-solid lubricants can successfully enter the market?

We used 3 different research methodologies for this study. In order to determine the current market, firstly we used primary research methods and interviews from 3 different suppliers. The second method is a critical review method for the product development of Molybdenum disulfide based solid and semi-solid lubricants. The extended business model canvas is the last method.

Findings showed that the Mongolian lubricant additive market was estimated high by the coming 5 years forecast. So far, we are using 100% imported lubricants. Additionally, we have several raw material sources, including Erdenet Mining Limited Liability company. Based on these findings, we developed the concept of Molybdenum based powder, grease, and paste production business model canvas and supply-chain design. Future studies should expand this study to Molybdenum disulfide lubricants production project concept development.



ZAYABOLOR BATKHUU – БАТХҮҮГИЙН ЗАЯАБОЛОР

Graduated study program –Төгссөн мэргэжил
Industrial engineering - Үйлдвэрлэлийн инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Tactical integrations scheduler, Underground operations, Oyu Tolgoi LLC – Оюу Толгой ХХК-д Гүний уурхайн Тактикийн нэгтгэлийн хуваарь гаргагч
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT scholarship 100%, twice - МГТИС-ийн нэрэмжит тэтгэлэг, 2 удаа • DAAD scholarship, twice - Германы эрдмийн солилцооны албаны тэтгэлэг, 2 удаа
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Resource Management in Electromobility: Case Study on Copper - Цахилгаан тээврийн хэрэгслийн эрдэс баялгийн менежмент. Зэсийн кейс судалгаа

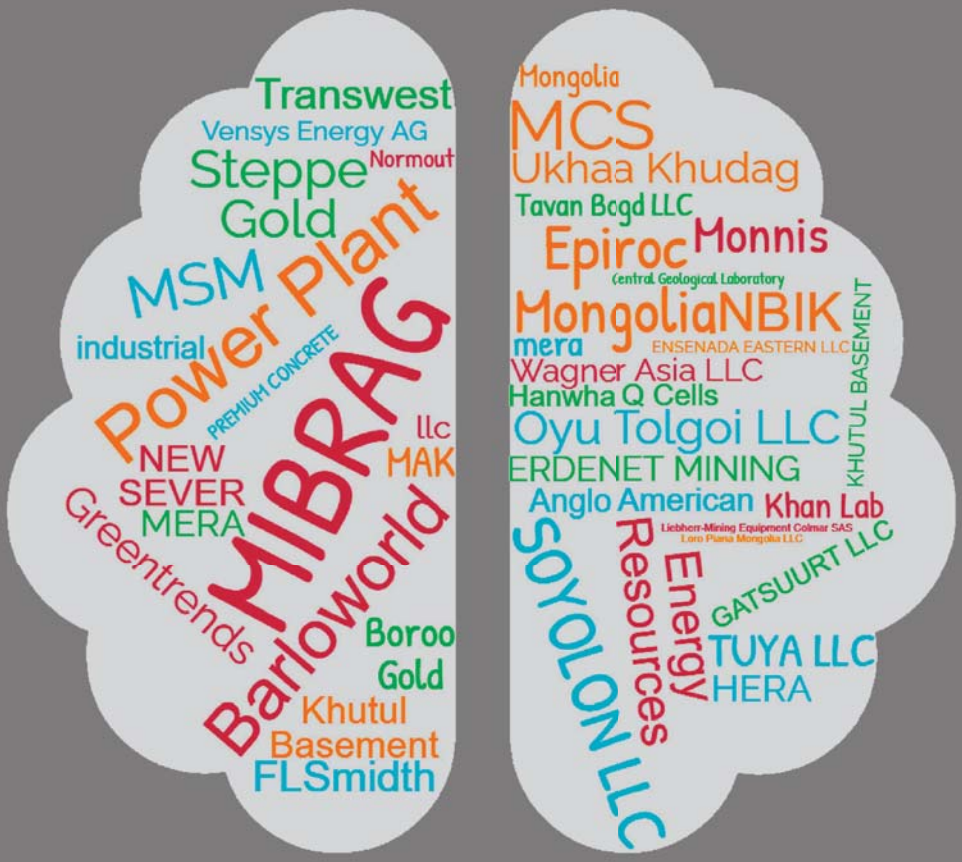
ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

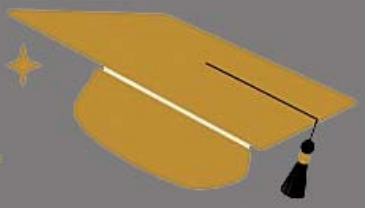
Electromobility is expanding in a rapid pace as it was considered a potential solution to reducing environmental pollution and oil shortage issues. Every type of electric mobility, such as Battery Electric Vehicles, Plug-In Hybrid Electric Vehicles, Hybrid Electric Vehicles rely on critical mineral resources heavily. Raw materials such as lithium, cobalt, copper, rare earth elements are crucial to the production of electric vehicles. Copper is one of the priority elements that are essential to electromobility technology. While copper is used throughout electric vehicles, charging stations and supporting infrastructure because of the metal's durability, high conductivity, and efficiency, it has the largest impact on the environment regarding CO2 loading.

This study shows various scenarios of the electric mobility technology types and forecast of future electric mobility demand worldwide by 2030 to estimate the demand of copper that is associated with electric mobility. Bass diffusion model which is used to predict the demand of newly introduced products was chosen as our main prediction tool. An analogous prediction of variables in the Bass diffusion model. In total, in year 2030, total demand for copper for electric mobility in general (all three types of vehicles) under the pessimistic, neutral, optimistic scenarios are 5Mt, 10Mt, 20Mt respectively. It is obvious that there are no temporary shortages that will be occurred because of the lack of resources, but the production supply might face excess demand or shortage.

Policies continue to have a major influence on the development of electric mobility. Government regulations will play a crucial role in expanding the sales of electric vehicles. Following this rise in demand, enough research and forecasting has to be done in order to prevent bad environmental consequences, in order to minimize the cost of implementing this system to countries. Entire automotive industry, its supply chain, technological aspects, research and development, operations, service and maintenance departments will require a completely different set of workforce and knowledge, systems will go through major changes. On top of this, the public opinion has to be changed and the period of adjusting will not be overnight. Due to lack and shortage of information, it is not possible currently to come up with a definite answer on Mongolia's position in this industry. The electric transportation industry is only at its beginning stages in Mongolia, therefore further research has to be made consistently in this field in order to come up with a consistent answer.

Internship places for graduates
Дадлагын байр санал болгогч компаниуд





Making Waves: Class of 2021

Davalgaalagch

ARIUNCHIMEG DASHTSEDEN – ДАШЦЭДЭНГИЙН АРИУНЧИМЭГ

Graduated study program –Төгссөн мэргэжил

Industrial Engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Expediting coordinator at Transwest Mongolia LLC - Трансвест Монголиа ХХК-д Экспедицийн зохицуулагч

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

GMIT Scholarship, 2020, 2021 - 2020, 2021 онд МГТИС-ийн нэрэмжит тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

APU LLC - "АПУ" ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Selected as a potential candidate and participated "UNAA" project; organized from GER HUB, 2020 - 2020 онд GER HUB -с зохион байгуулсан "УНАА" төсөлд оролцсон
2. Become a one of the student successors in Global Shapers Global Community and participated 3 months projects within team, 2020 – 2020 онд Global Shapers Global Community-ийн оюутны залгамжлагчдын нэг болж, багаар 3 сарын төсөлд оролцсон
3. Participated and won 2nd prize in "DGL Hackathon" 2018 - 2018 онд "Галтууд" ХХК-аас зохион байгуулсан "DGL Hackathon" тэмцээнд оролцож 2-р байр
4. Organized by "Galtuud" LLC; selected and become a founding member of "Burried Life" mental health project in between, 2020-2021 - 2020-2021 оны хооронд "Burried Life" сэтгэцийн эрүүл мэндийн төслийн үүсгэн байгуулагч гишүүнээр сонгогдсон
5. Active member of "Morning club and Debate club" participated several debate competitions with club members? - "Өглөөний клуб ба Мэтгэлцээний клуб"-ийн гишүүн байсан клубын гишүүдтэй хэд хэдэн мэтгэлцээний тэмцээнд оролцсон

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Industrial Engineering a stepstone for the further development of the Mongolian Economy Observations and recommendations made; based on a comparison of the IE profession in Germany and Mongolia and its potential impact on the GMIT IE curriculum. - Монгол болон Герман дахь "Үйлдвэрлэлийн эдийн засагч инженер" мэргэжлийн хооронд харьцуулалт хийж, МГТИС-ийн хөтөлбөрт сайжруулалтын санал зөвлөмж боловсруулах"

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Industrial Engineering is the brand-new profession in Mongolia and provided only by German Mongolian Institute of Resources and Technology. The process of developing and implementing the profession is in the middle. The current curriculum of the IE faculty 'is providing a solid platform for a start since 2018. However, to further develop the syllabus, a team is already implemented to create the IE curriculum of the nearer future.

This study aims to contribute to this working group's discussions, particularly to questions regarding the specific content of IE programs and their potential fit to the demand and requirements of the industrial sector in Mongolia. In particular, the study has an intention to estimate how the IE current representation can be better targeted in order to increase their potential demand in the Mongolian labor market. Specifically, it investigates what is industrial engineering in Mongolia at the present time covering the current IE program at GMIT, expectations of companies on the IE disciplines, and experiences of students/alumni.

In this context, the IE program at GMIT is compared to German IE programs based on the book "Industrial Engineering Qualification Framework" to assess the core areas of the study. The practical investigations are shaped with questionnaires from the candidates (students, alumni, companies). The study of the panel concluded that the IE program at GMIT does not have even distribution for the core areas of the disciplines. It covers too much natural sciences (the MINT area) in the first two years and includes management modules (the Integrity area) in the last three semesters. The results showed that the GMIT should reconsider the core areas of the program and need to identify the program's final will. The survey concluded that the profession has a positive impact on in-demand human resources in the Mongolian jobs market. The set of competencies IE graduates need to possess to ensure a contribution to the Mongolian industry is mentioned in the study. These results suggest that to create a potential and most in-demand IE curriculum for the GMIT needs to cooperate with companies and intersect their needs with the IE program.

BAT-OCHIR BATTUMUR – БАТТӨМӨРИЙН БАТ-ОЧИР

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Studying for a master's degree at TU Freiberg - ХБНГУ-ын Фрайбергийн Их Сургуульд Магистрын оюутан

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- DAAD Scholarship, 2017-2020 - 2017-2020 онд Германы эрдмийн солилцооны албаны тэтгэлэг
- DAAD Scholarship for an Exchange Semester, 2021 – 2021 онд Германы эрдмийн солилцооны албаны "Оюутан солилцооны хөтөлбөр"

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Energy Resources LLC - Энержи Ресурс ХХК
- Soyolon LLC - Энержи Ресурс ХХК
- Central Geological Laboratory - Геологийн Төв Лаборатори

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. National Olympiad of Introduction to Electrical Engineering, 1st place, 2019 – 2019 онд Цахилгааны инженерийн улсын олимпиадад 1-р байр
2. MUST-Power Engineering School "Who Knows Chemistry Well?" team competition 1st place, 2019 - 2019 онд ШУТИС- Эрчим хүчний сургууль "Химийг хэн сайн мэдэх вэ?" сэдэвт багийн тэмцээн 1-р байр
3. NUM-Department of Chemistry Bronze medal, 2019 – 2019 онд МУИС-Химийн танхимын Улсын физикийн олимпиадын хүрэл медаль
4. Bronze Medal from National Physics Olympiad, 2018 – 2018 онд Механикчдын үндэсний багийн тэмцээнд 3-р байр
5. National Mechanics Team Competition 1st place in MUST-School of Mechanical Engineering, 2018 – 2018 онд Механикчдын үндэсний багийн тэмцээнд 1-р байр
6. National Mechanics Olympiad 4th place in MUST-School of Mechanical Engineering, 2018 – 2018 онд ШУТИС-Механикийн сургууль Механикийн улсын олимпиадад 4-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Beneficiation of Titanium Ores by Froth Flotation - Титаны хүдрийг хөвүүлэлтийн аргаар баяжуулах судалгаа

ABSTRACT OF BACHELOR THESIS:

In this thesis paper, the possibility of extracting titanium dioxide concentrate is examined on the deposit recently discovered in Mongolia. According to the drill core test performed by Aachen University, the deposit contains a considerable amount of leucoxene, which is the weathered product of ilmenite. In the past, many scientists studied how to improve the poor efficiency of conventional ilmenite collectors. Consequently, the use of lead and cupric ion activators and mixed flotation showed noticeable improvement in ilmenite floatability. Moreover, the pre-removal of magnetite from the titanium ore is proven to be a practical arrangement to achieve higher recovery in flotation. Based on these studies, the scheme for enriching titanium dioxide concentrate from the titanium ore sample is developed.

БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Энэхүү диссертацийн ажилд сүүлийн үед Монголд нээгдсэн ордоос титаны давхар ислийн баяжмал олборлох боломжийг судалсан болно. Аахены их сургуулиас хийсэн өрмийн гол туршилтын дагуу тус орд нь ильменитын өгөршсөн бүтээгдэхүүн болох лейкоксиныг ихээхэн хэмжээгээр агуулдаг. Өнгөрсөн хугацаанд олон эрдэмтэд ердийн ильменит цуглуулагчдын үр ашгийг хэрхэн сайжруулах талаар судалж байсан. Үүний үр дүнд хар тугалга, куприк ионы идэвхжүүлэгч, холимог флотаци хэрэглэснээр ильменитийн хөвөх чадвар мэдэгдэхүйц сайжирсан байна. Түүнчлэн титаны хүдрээс магнетитийг урьдчилан зайлуулах нь флотацийн өндөр сэргэлтийг бий болгох бодит арга хэмжээ болох нь батлагдсан. Эдгээр судалгаан дээр үндэслэн титаны хүдрийн дээжээс титаны давхар ислийн баяжмалыг баяжуулах схемийг боловсруулсан.

Graduated study program –Төгссөн мэргэжил
Industrial engineering - Үйлдвэрлэлийн инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Reducing operational cost through tailing thickener systems for Erdenet Mining Corporation - Эрдэнэт түйлдвэрийн хаягдлыг өтгөрүүлэх замаар үйл ажиллагааны зардлыг бууруулах нь

BATTSENGEL BATBAYAR – БАТБАЯРЫН БАТЦЭНГЭЛ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Erdenet Mining Corporation, a State-owned enterprise, is one of the biggest Ore mining and Ore processing factories in Asia and is the fourth largest copper mine globally. Erdenet mines 37 million tons of ore, produces 32 million tons of ore and 580 thousand tons of copper, about 5 thousand tons of molybdenum concentrate.

The concentration plant is the main production unit with technological circuits, including ore crushing, grinding, flotation, filtration drying, and shipping of the copper and molybdenum concentrates. The ore processing technology is operated in collective flotation methods, and the copper and molybdenum concentrate is extracted using a separation process. Waste pulp from the concentration process is compressed to the disposal pond. Slurry directly transports to the tailings.

The thesis will focus on the slurry transportation system of Erdenet tailings. Current situation of the slurry transportation system, how the slurry transportation system works. Building a thickener to decrease the slurry volume to transportation will decrease the tailings volume and reduce the water's evaporation and penetration through bottom soil. This process can increase efficiency. Engineering and economic calculations will show how and in what ways to reduce operating costs.

Research question

How do engineering and economic efficiency change after building a thickener?

BYAMBAJAV GANBOLD – ГАНБОЛДЫН БЯМБАЖАВ

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Chemist at Med Impex International LLC - Медимпекс Интернэйшнл ХХК-д Химич

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

GMIT Excellent student scholarship - МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Energy resource LLC - Энержи Ресурс ХХК
- Soyolon International LLC - Соёолон Интернэшнл ХХК
- Central laboratory of mineral and petroleum - Уул, уурхай, газрын тосны төв лаборатори

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

Student symposium 3rd place, 2017 – 2017 онд Оюутны симфозиумын 3-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Cracking Strategies for Mongolian Crude Oil Based on Crude Oil Characteristics - Түүхий нефтийн шинж чанарт тулгуурлан Монголын түүхий нефтийг хагалах стратеги

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Now day's global development is moving towards a clean energy but petroleum still plays an important role in transportation, heating and raw materials of chemical industry. Unfortunately, the world's light crude oil production approaches limit and resource is decreasing rapidly so the attention focused on refining of heavy crude oil. The cracking technology is necessary to convert the paraffinic residual oil to lighter distillates for the production of transportation fuels and chemicals.

The aim of this study was to characterize physical and chemical properties of Tsagaan-Els oil of Mongolia, its atmospheric residue (>350°C) and hydrocracking products. The hydrocracking experiment was carried out with and without catalyst at temperature 450°C for 1h-3h under hydrogen pressure of 5kPa. Commercial Ni-Mo/Al_2O_3 catalyst (Ni 3%, Mo 15%) was used in the hydrocracking experiments for 1 and 2 h. Tsagaan-Els deposit has a conventional crude oil with a high paraffin content. The paraffin obtained from the residue of Tsagaan-Els oil contained ***n***-alkanes of 92.12% with carbon atoms C_{17}–C_{31}. The contents of asphaltenes and resins in the residue were low (15.48%). Fractional distillation showed that the yield of light distillate is 11.64 wt% and the yield of middle distillates is 14.73 wt%. The yields of light and middle distillates obtained by hydrocracking of the atmospheric residue for 3 h without catalyst were 15.8 and 17.7wt% respectively. Effect of catalyst was tested in the experiments for 2h. By the hydrocracking with catalyst the yield of light distillate has increased 4.5 wt% in comparison with the yield of light distillate obtained from experiment without catalyst.

GC-MS analysis showed that light and middle distillates contain very low amounts of hetero-atomic compounds and high amounts of aliphatic hydrocarbons suitable for production of gasoline and diesel feedstock.

CHINGUUNBILEG SUMIYADORJ – СУМЬЯАДОРЖИЙН ЧИНГҮҮНБИЛЭГ

Graduated study program –Төгссөн мэргэжил

Mechanical engineering - Механик инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Mining engineer at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Уул уурхайн инженер

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- Mongolian Government Scholarship - Монгол Улсын засгийн газрын тэтгэлэг
- GMIT Exellent Student scholarship 50%, 2017 - 2017 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлэг 50%
- DAAD scholarship - Германы Эрдмийн Солилцооны Албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

Erdenes Mongol LLC - Эрдэнэс Монгол ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Oyu Tolgoi Research Project - Optimization of ball charge for SAG mills - Оюу толгой компаний үйлдвэрлэлийн судалгааны хөтөлбөрийн оролцогч
2. GMIT Robotics Club Member /Co-Moderator/ - МГТИС-ийн робот техникийн клубын гишүүн /дэд модератор

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Probabilistic Estimation of Fatigue Strength based on the Maximum Likelihood Procedure - Хамгийн их үнэний хувь бүхий үнэлэлтийн арга дээр үндэслэн цуцалтын тооцоот эсэргүүцлийг магадлалын тооцоогоор тодорхойлох

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Fatigue strength is one of the core principles for designing mechanical 'components. It has been a constant concern for engineers, as mechanical failure occurs due to loading exceeding the fatigue strength. This concern has led to a necessity to develop new approaches to estimate the reliability of mechanical components. The conventional method that is used to test fatigue strength is the staircase method. However, the staircase method's ability to calculate fatigue strength is potentially unreliable. The bias and scatter associated with fatigue testing shows the limitations of fatigue strength estimation when the staircase approach is used. The conventional methods of fatigue limit determination also have key flaws, in that they are subjective, time consuming, and costly. This research aims to develop a method that would reliably estimate the fatigue strength of materials, whilst using a lower amount of test results.

The present study is intended to formulate and analyze a proposed method of estimating fatigue strength by utilizing a smaller number of tests. The aforementioned method that this paper aims to formulate, mainly focuses on a probabilistic estimation based on the Maximum Likelihood Procedure. The proposed method is applied to existing fatigue test data and its effectiveness is compared with other methods.

DUURENBAYAR LKHAMKHUU – ЛХАМХҮҮГИЙН ДҮҮРЭНБАЯР

Graduated study program –Төгссөн мэргэжил

Environmental Engineering - Хүрээлэн буй орчны инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Greentrends LLC - Грийнтрэндс ХХК

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

GMIT scholarship, 2020-2021 - 2020-2021 онд МГТИС-ийн нэрэмжит тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

Oyu Tolgoi LLC, Water Supply and Sewerage Authority-at Central wastewater treatment plant - Оюу Толгой ХХК, Ус сувгийн удирдах газар-Төв цэвэрлэх байгууламжид

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

- The GMIT team won second place in the inter-district competition organized by the Red Cross - Улаан загалмайн нийгэмлэгээс зохион байгуулсан дүүрэг хоорондын тэмцээнд МГТИС-ийн баг 2-р байр эзэллэсэн.
- Participated in the "Young Researchers Support Program" organized by the National Center for Integrated Development and passed the second stage - Цогц хөгжлийн үндэсний төвөөс зохион байгуулсан "Залуу судлаачдыг дэмжих хөтөлбөр"-т хамрагдаж хоёрдугаар шатанд тэнцсэн

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Determination of Arsenic, Lead, and Chromium in wastewater - Хаягдал усан дахь хүнцэл, хар тугалга, болон хромын агууламжийн утгуудын статистик шинжилгээ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Heavy metal treatment is currently the subject of a lot of studies. Lead, chromium, and arsenic in wastewater of the Central Wastewater Treatment Plant in Ulaanbaatar were characterized in this thesis. Data on heavy metal monitoring results in wastewater for years were acquired from the Central Water laboratory of the Water and Sewerage Authority. Descriptive and One-Way, Two-Way ANOVA (Analysis of variance) statistical tests were performed to reveal the characteristics of the sample distributions of heavy metal elements in wastewater. The relativeness of the data variables was analyzed mainly by the correlation test. Various extents of positive skewness (skewed right) were observed from all studied variables in lead, arsenic, and chromium; its right tail is longer and most of the distribution is at the left. Heavy metal content increases in winter and decreases in summer. Heavy metal studies were measured with an Inductively Coupled Plasma Mass Spectrometry (ICP-MS) instrument. In terms of the allowance limit of the heavy metal concentration for the World Health Organization and Mongolian sewage water standard MNS: 6561:2015, lead and arsenic did not exceed Mongolia's wastewater standards, while chromium has exceeded both WHO and Mongolian standards.

Graduated study program –Төгссөн мэргэжил
Industrial Engineering - Үйлдвэрлэлийн инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Creating a Competitive Advantage for "Company A" through the Supply of a Self-Compacting Concrete to the Mongolian Market - Монголын зах зээлд өөрөө нягтардаг бетоны нийлүүлэлтээр "Компани А"-д өрсөлдөөний давуу тал бий болгох нь

ENKHNOMIN ENKHJARGAL – ЭНХЖАРГАЛЫН ЭНХНОМИН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

As the construction industry is developing rapidly, our country must keep pace with the world's development. An essential raw material in the construction industry is concrete, and one of the current trends in concrete production is the production and introduction of self-compacting concrete. Self-compacting concrete (SCC) manufacturing is growing dramatically because of its numerous advantages in terms of enhanced properties and uses. The global self-compacting concrete market is projected to grow at a CAGR of 6.1% throughout the forecast period of 2017 to 2024. SCC was first invented in Japan in the late 1980s; and this type of concrete is characterized by that it flows under its own weight without any external vibration. SCC offers many benefits such as HSE and high placement rate; and this improved construction practices make self-compacting concrete desirable for precast concrete and civil engineering construction.

"Company A" is one of the country's leading producers of ready-mixed concrete and is unique in that they professionally study and introduce engineering solutions to the market to meet the needs and requirements of concrete for civil construction and infrastructure. One of the engineering solutions that the company introduced is SELFCOMPACTING CONCRETE, a new product in the Mongolian concrete market. The company has already proved that it is possible to produce self-compacting concrete using raw materials commonly available in Mongolia by conducting experiments at laboratory and plant levels.

The subject is that the company can create a competitive advantage over its competitors by supplying this type of concrete, which any company has not introduced to the Mongolian market yet. In this thesis, the company's performance on the research and development processes of self-compacting concrete are analyzed and; furthermore, the ways that how the company could outperform its rivals are discussed.

GUNDEGMAA BUKHBAATAR – БӨХБААТАРЫН ГҮНДЭГМАА

Graduated study program –Төгссөн мэргэжил
Environmental Engineering - Хүрээлэн буй орчны инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Environmental Specialist - Байгаль орчны мэргэжилтэн
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT Excellent Student Scholarship, 2017-2020 - 2017-2020 онд МГТИС-ийн шилдэг оюутан тэтгэлэг • DAAD Scholarship, 2018-2021 - 2018-2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
• Erdenet Mining Corporation - Эрдэнэт үйлдвэр ТӨҮГ • Tuya LLC (Cashmere processing industry) - Туяа ХХК (Ноолуур боловсруулах үйлдвэр) • Energy Resources LLC - Энержи ресурс ХХК
Bachelor thesis topic –Бакалаврын дипломын сэдэв
Study of Electro Flotation Treatment Plant Design for Industrial Wastewater - Үйлдвэрийн бохир усны цахилгаан флотацийн цэвэрлэх байгууламжийн зураг төслийн судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The textile industrial wastewater is classified as highly polluted effluent as it contains a high the concentration of suspended solids and dissolved organic compounds. The wastewater is treated as a mixed stream from all textile industry processes internationally. However, more than 50% of textile industries are primary and only have a scouring process in Mongolia. Therefore, developing and studying alternative wastewater treatment systems in primary wool scouring industries in Mongolia is necessary. The goal of this thesis is to investigate if electroflotation is suitable for wastewater treatment of wool scouring industries in Mongolia. The effect of different parameters including initial pH applied current, and electrode materials on the removal efficiency of TSS and COD were studied. The optimum operating condition of a batch electroflotation reactor containing an aluminum anode and copper cathode with 1 hour operation time in the laboratory was determined. For wastewater sample with 2645 mgTSS/L TSS, 430 mg/L BOD5, and 2806 mg/L COD, the highest removal efficiency of TS (61.86%), TSS (92.82%), and COD (88.81%) were achieved when the power supply was 5A at 15V with initial pH at 6.83, the distance between electrodes at 2.5 cm. To investigate the influencing parameters of the electroflotation process on the pollutants' removal, statistical analysis was carried out. The results showed that the treatment efficiency of pollutants is significantly dependent on applied current and pH.

INDRA BATBILEG –
БАТБИЛЭГИЙН ИНДРА

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering -
Эрдэс баялаг боловсруулалтын инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Geotechnical engineer at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Ил уурхайн геотехникийн инженер

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- DAAD Scholarship, 2017-2021 - 2017-2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг
- GMIT Excellent Student Scholarship 50%, 2017 - 2017 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг 50%
- ETT JSC research work scholarship - ЭТТ ХК-ийн эрдэм шинжилгээний ажлын тэтгэлэг
- Engineering Summer School scholarship - Инженерийн зуны сургалтын тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Energy Resource LLC - Энержи Ресурс ХХК -
Central Geological Laboratory - Геологийн Төв Лаборатори

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. ADB Mongolia "Importance of partnership through my eyes" public speaking competition among students– gratitude and gift - АХБ-ны Монгол дахь салбар "Миний нүдээр түншлэлийн ач холбогдол" оюутнуудын дунд илтгэлийн уралдаан – талархал, бэлэг
2. Dale Carnegie Mongolia "High impact graduates- 2020" – certificate of achievement - Дэйл Карнеги Монгол "Өндөр нөлөөлөл төгсөгчид-2020" – амжилтын гэрчилгээ.
3. GMIT in poetry competition – 3rd place, certificate.
   МГТИС-ийн Яруу найргийн уралдаанд 3-р байр, гэрчилгээ
4. Carnival and Easter competition at GMIT 4th, 5th places – МГТИС-ийн багт наадам, Улаан өндөгний баярын тэмцээн 4, 5-р байр
5. Certificate of Appreciation Mongolian Children's 6th Winter Game as a volunteer - Монгол хүүхдийн өвлийн 6 дахь удаагийн наадамд сайн дурын гишүүнээр оролцож талархал
6. Letter of Gratitude volunteer work Sakhalin, Russia.
   ОХУ-ын Сахалин дахь сайн дурын ажилтны талархлын захидал - Volleyball competition of GMIT-1st, 3rd place.
   МГТИС-ийн волейболын тэмцээн 3-р байр - Table Tennis competition of GMIT – 2nd, 3rd places.
   МГТИС-ийн ширээний теннисний тэмцээн – 2, 3-р байр
7. Basketball competition between GMIT ,1st place. 2nd places - МГТИС-ийн сагсан бөмбөгийн тэмцээн, 1, 2-р байр

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Study on solid particles and chemical elements, which affect crud formation, in pregnant solution of low-grade copper ore leaching - Уусган баяжуулсан бага агуулгатай зэсийн хүдрийн ачаалагдсан уусмалд крад үүсгэх хатуулаг мөхлөгүүд, түүний химийн элементүүдийг судлах

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The Solvent Extraction operations often suffer from increased purification complexity due to crud formation at the interface of aqueous and organic phases. Ion exchange resins have been used as an option to increase the separation efficiency of the selected metal ions from the solution before SX process.
This work in this thesis aimed to understand and characterize the elements of crud. Furthermore, to have an option to minimize crud formation in low-grade copper ore pregnant leach solution

LKHAGVASUREN GURBAZAR – ГУРБАЗАРЫН ЛХАГВАСҮРЭН

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering - Механик инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Mechanical engineering at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Механик инженер

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship 100% - МГТИС-ийн нэрэмжит тэтгэлэг 100%
- DAAD Sur Place scholarship - Германы эрдмийн солилцооны албаны Sur Place тэтгэлэг
- DAAD student exchange in Freiberg- Германы эрдмийн солилцооны албаны "Оюутан солилцооны хөтөлбөр"

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

Barloworld Mongolia LLC - Барловорлд ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. 2nd place in the National Electrical Olympiad - Улсын цахилгааны олимпиад 2 дугаар байр
2. 1st place in the mechanical engineering team Olympiad - Механик инженер олимпиад багийн төрөлд 1-р байр
3. Student conference, 3rd place, 2017 – 2017 онд Оюутны бага хурал, 3 дугаар байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Optimization for Operational regime of water pumping system at process plant - Боловсруулах үйлдвэр дэх усны шахуургын системийн ажиллагааны горимыг оновчтой болгох

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Water distribution systems have a significant energy impact on mineral processing due to the large amount of energy consumed in water pumping. Thus, the economical and efficient operation of the water pumping system is a crucial concern in mining companies. Furthermore, the careful operation of the pump may lead to considerable energy savings and minimize mechanical wear.

Therefore, the present research is aimed to optimize the pump operation policy of the circulating water pumping station at Erdenet Mining Corporation (EMC).

The circulating water pumping station is a vital facility at the EMC that is responsible for supplying about 84% of the processing water to the mineral processing plant. This facility consists of 5 main pumps which have high electric consumption. In addition, at EMC, three types of electricity tariffs are employed: daytime consumption, evening consumption, and night consumption. Each tariff zone has different prices for electricity utilization. Therefore, the research aimed to optimize the operational policy of the pumps by taking advantage of different tariffs. With this idea, background research was conducted to evaluate the most appropriate optimization techniques and algorithms to optimize the pump operation. Based on the careful consideration of findings, the combination of tank level and pump scheduling methods was selected in this dissertation.

In addition, initially, a genetic algorithm was selected for the simulation. However, due to the complexity of mathematical expression and preliminary simulation results, two MATLAB codes are developed in this study. The first MATLAB code is written to attain the optimal tank level pattern over the 24 hours operation. The second code is designed to determine the optimal pump discharge at each hour based on the tank level profile obtained in the first code. Each simulation showed that considerable operational cost reduction could be achieved while guaranteeing all the system constraints and requirements.

The obtained results show that optimization of pump operation can minimize energy cost up to 30% compared to the actual operation. Moreover, the present research has shown that optimizing pump operation is possible by taking advantage of various electric tariff systems, water storage tanks, and variable speed drives.

Graduated study program –Төгссөн мэргэжил
Industrial Engineering - Үйлдвэрлэлийн инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship 50% - МГТИС-ийн нэрэмжит тэтгэлэг 50%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Decline and sustainable recovery strategies for Mongolia's tourism sector in the wake of the Covid-19 pandemic - Ковид-19 цар тахлын дараах Монголын аялал жуулчлалын салбарын уналт болон тогтвортой нөхөн сэргээлтийн маркетинг стратеги

MARALGOO TUMENKHARAATSAI – ТҮМЭНХАРААЦАЙН МАРАЛГОО

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Coronavirus disease 2019 (COVID-19), also known as the coronavirus, or COVID is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China, in December 2019. The disease has since spread worldwide, leading to an ongoing pandemic. This phenomenon has affected all people of an levels in many ways. Besides the effect on humanity and individuals, it hits each sector of industries hard. The tourism industry in each county has faced a crisis and decline due to restrictions and the pandemic of COVID-19. For Mongolia, the tourism sector has been a small contributor to the Mongolian economy due to the lack of tourism management and the development of it. The activities and income of the tourism sector depend on the number of tourists coming to our country. As of the second quarter of 20205 43,779 tourists visited Mongolia, which is five times less than in previous years. This has led to a stagnation in the tourism sectors a decline in the revenues of many businesses operating in the sector and those directly or indirectly dependent on the sector, and a stagnation in operations. Regardless of the size of the business, all types of business, especially in the airline and tourism sectors, face significant challenges, such as declining incomes bankruptcies and job losses. Due to the rapid infection of COVID-19 the Mongolian government had taken a step on restrictions and the result was significantly more positive than other countries before November 11 2021, when the first case was reported in Mongolia. Due to the global outbreak of coronavirus (COVID-19), Mongolia's border crossings were closed on January 31, 2020. In January of this year, 748 citizens Of Mongolia were on special duty flights, 4 citizens were on road and railway ports, in February 1195 citizens of Mongolia were on special duty flights, 65 citizens were on the road and railway ports, and in March 2,076 citizens arrived on special duty flights, and 41 citizens arrived by road and railway ports. Most importantly in the fourth quarter of 2019, tourists with a total number of 577,300 from 184 destinations out of 250 have visited Mongolia. Due to the COVID-19 in the first quarter of 2021, the total number of tourists who visited Mongolia has decreased down to 3,760 as the number of destinations has decreased down to 52. In 2019, most tourists visiting Mongolia were from China, However, most tourists that are coming to Mongolia are currently from Uganda. In 2017, the Ministry of Nature, Environment, and Tourism (MNET) and the Tourism Development Center (TDC) organized a "Mongolian Tourism Revenue and Expenditure Survey" in collaboration with the MNET, established. The survey is based on data from foreign tourists and tour operators that provide services to foreign tourists, the survey questionnaire was distributed and collected in collaboration with the MNET, the State Customs Service, UBTZS MIAT JSC, and the Mongolian Association or Journalists and its member organizations. The majority of respondents came to see Mongolian traditional customs and wildlife, and 38% rated the services of tour operators as excellent, 33% as good, and 19% as average, In addition, 40% of all travelers rated the level of satisfaction with the accommodation service as good, 26% as average, and 24% as very good. With the help of the information of the satisfaction level of tourists before COVID-19 and the information of the most occupied destination, it can facilitate the development of marketing strategies of the Mongolian tourism sector. This thesis will provide you 1. how the Mongolian tourism sector has faced challenges in an economic way and 2. What marketing strategies are best to recover the decline of the sector.

Graduated study program –Төгссөн мэргэжил
Raw materials and process engineering - Эрдэс баялаг боловсруулах инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
Darkhan Metallurgical Plant scholarship - Дарханы төмөрлөгийн үйлдвэрийн тэтгэлэг
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Oxidized copper ore leaching with glycine - Зэсийн исэлдсэн хүдрийг глицинээр уусгах

MUNKHBAT MUNKH–ERDENE – МӨНХ–ЭРДЭНИЙН МӨНХБАТ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

More than 20 % of copper in the world is produced by hydrometallurgy. The oxidized copper ore is usually leached with dilute sulfuric acid. However, other leaching agents are still being researched to improve metal recovery and environmental protection. Recently, many other reagents such as Glycine in the lab and pilot-scale are being studied and show good opportunities to use. Therefore, the main subject of this Bachelor Thesis should be investigating an alternative leaching agent, Glycine, to leach oxidized copper ore from Erdenetiin ovoo and Oyu Tolgoi regarding the metal recovery and consumption of reagents.

Dissolution of low-grade copper ore containing 0.05% grade was investigated at different concentrations, solution pH, and peroxide concentration. We used agitation leaching to determine the right proportion of parameters. For example, it was observed that high concentration increases copper dissolution for low-grade oxidized copper ore. The optimum initial solution pH was kept to be 1 1. Hydrogen peroxide was investigated as a strong oxidant; however, it did not significantly affect metal recovery. Therefore, it is assumed that hydrogen peroxide increased the metal extraction rate at the beginning of the process. Also, kinetic study of malachite is investigated. Based on the kinetic calculation, a laboratory leaching experiment was developed and the volume and type of the tank were selected at a 90% conversion plant with a capacity of 100,000 tons per hour.

Graduated study program –Төгссөн мэргэжил
Industrial engineering - Үйлдвэрлэлийн инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Manufacturing of products from recycled plastic in Mongolia: Investigation of the technical and economic potential based on the example of recycled plastic trash bins - Монголд дахин боловсруулсан хуванцараар бүтээгдэхүүн үйлдвэрлэх техник эдийн засгийн боломж: Дахин боловсруулсан хуванцар хогийн савны жишээн дээр

NAMUUN NYAMSUREN – НЯМСҮРЭНГИЙН НАМУУН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Plastic takes the longest degradation time, but most of it is used for the short term.

It is worthwhile to examine the reduction and replacement of imported plastic products while recycling plastic waste.

All needed equipment and raw material costs for the plastic production factory are analyzed to produce 240-liter wheelie bins and other alternative products, namely, 120Liter wheelie bins, pallets, bottle crates, shopping baskets. They are all made from recycled HDPE or PP plastics. Feasibility analysis included market analysis, cost estimation including the production line's capital, and operating expenses from raw material to the final product. Infrastructure and land costs are excluded due to assumed as it exists. As investigated, producing only 240-Liter wheelie bins is non-profitable without named alternative products

NANDINTSETSEG GANBAATAR – ГАНБААТАРЫН НАНДИНЦЭЦЭГ

Graduated study program –Төгссөн мэргэжил

Industrial engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

TU Bergakademie Freiberg - Фрайбергийн Технологийн Их Сургуульд Магистрын оюутан

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT Excellent Student Scholarship - 3 times - МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг 3 удаа
- DAAD Surplace Scholarship - 2 times - Германы эрдмийн солилцооны албаны тэтгэлэг 2 удаа
- Summer School Scholarship - 3уны сургалтын тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

MERA LLC - МЕРА ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Student member of Research Committee - Судалгааны хорооны оюутны төлөөлөл
2. Vice President of Student Council - Оюутны зөвлөлийн дэд ерөнхийлөгч
3. "Who Knows Chemistry Well" Chemistry Olympiad for National Competition, 2nd place, 2018 -2018 онд "Хэн хими сайн мэдэх вэ" химийн улсын олимпиадын 2-р байр,

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Challenges and Opportunities of Developing Learning Factory in Mongolia - Монголд сургалтын үйлдвэр, цех хөгжүүлэх боломж ба бэрхшээл

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Keeping pace with the rapidly approaching technological development and simultaneously decreasing production life cycle is becoming harder year by year. To do so and to fit into the Megatrends that are describing the near future, companies are striving with their full potential to save time and cost with the help of a Learning Factory. As the Learning Factory is not an old enough term - introduced in 1994 - it must be studied thoroughly.

First, corresponding literature research was done to get a deeper understanding related to the Learning Factory. Following this step, secondary research was done on the Mongolian situation and industrial sector. Interviews were taken from different fields, including industry, education, and research, to attain the primary data.

Based on the findings, the possibility of introducing a Learning factory in Mongolia was studied. List of potential activities and equipment are chosen to develop competencies in the demand in the current work field. Further challenges and opportunities of introducing Learning Factory in Mongolia are forecasted based on the worldwide experience.

NARANGEREL NOMCHBAATAR – НОМЧБААТАРЫН НАРАНГЭРЭЛ

Graduated study program –Төгссөн мэргэжил
Industrial engineering Үйлдвэрлэлийн инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Master degree TU Freiberg - ХБНГУ-ын Фрайбергийн Их Сургуульд Магистрын оюутан
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
• GMIT semester 50% scholarship - МГТИС-ийн нэрэмжит 50% тэтгэлэг • DAAD scholarship for exchange semester - Германы эрдмийн солилцооны албаны оюутан солилцооны тэтгэлэг
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
Ensenada Eastern LLC - Энсэнада Ийстерн ХХК
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Developing entrepreneur curricula and extra-curriculum at GMIT - МГТИС-д энтрепренершип сэтгэлгээг оюутнуудад сургалт болон сургалтаас гадуур үйл ажиллагаагаар дамжуулан хөгжүүлэх нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

With the rapid development of technology in the 20th and 21st century, the breadth and depth of development in most sectors have increased exponentially. As a result, the criteria for hiring people are shigting to personal skill than technical knowledge. Team working, communicating, problem solving and independent learning become most useful skill in human life. This thesis work aims to develop the existing currimculum and extra curriculum at GMIT in for more entrepreneurial activities. Describe the need and reson for engineering universities adding entreprenership into academic level. If developing how to develop the current situation at GMIT are answered in this theis. The basic developmetn Idea are described. In one word this thesis try to answer when, what, how to teach entreprenrship at GMIT.

NOMINJARGAL OTGONJARGAL – ОТГОНЖАРГАЛЫН НОМИНЖАРГАЛ

Graduated study program –Төгссөн мэргэжил

Industrial Engineer -
Үйлдвэрлэлийн инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Supply Chain Senior Manager at New Sever LLC - Нью Север ХХК-д Хангамжийн ахлах менежер

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- DAAD scholarship - Германы эрдмийн солилцооны албаны тэтгэлэг
- GMIT scholarship 5 times - МГТИС-ийн нэрэмжит тэтгэлэг 5 удаа

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Transwest Mongolia LLC - Трансвест ХХК
- New sever LLC - Нью север ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

Student Conference- 3rd place - Оюутны бага хурал- 3-р байр

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

ROAD DUST SUPPRESSION USING LIGNOSULFONATE ON UNPAVED ROAD - Лигносульфонатын уусмалыг ашиглан авто замын тоосжилтыг бууруулах.

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The thesis study was conducted within the private company reservation. Collected samples were transported from Omnogobi, Khanbogd sum, Javkhlant bag. The most mined products which exploited and processed earth precious metals and other materials transported by land to China.
Which is the cause of heavy transportation on unpaved road that causes respiratory problems of drivers and near residents, environmental hazards of flora and fauna, endangerment of wildlife. The exact location of an area that the soil samples were collected is not clear. Objective of this study is to develop affordable technique to reduce dust emission from the road.
Especial objectives area:
- Road suspension dust property, its health impact and suppressing techniques;
- Determine mechanical properties of Gobi soil regarding to the water content;
- Study how the mechanical properties of the soil change under the influence of lignosulfonate dust suppressant solution in a laboratory test;
Dust can be defined an almost inevitable consequence of heavy transport. Gravel and hard rock particles always contain a proportion on fines and if the material is dry, a fairly heavy dust cloud can be raised when it is impelled. In this study, different concentration of lignosulfonate dust suppressant used in all tests except mechanical sieving and hydrometer analysis. The concentration of lignosulfonate are: 2%, 4%, 6%, 8% and water. Mechanical properties of soil, Atterberg limit tests and hydrolysis analysis were carried out to determine the soil property, composition and swell potential which is the basis of the experiment. As a result of the analysis on the Gobi sample contains 9.57% pebbles, 21.75% granules, 54.19% coarse sand, 10.94% of medium sand and 2.52% silt and 1.02% is clay. For the comparative study, Nalaikh area soil samples were used. Atterberg limits of that sample was not able to take place because of its poorly graded composition, determined coefficient of uniformity and coefficient of curvature which indicates that the soil is poorly graded that consist mainly coarse particles and lack of silt and clay. A laboratory soil compaction test on 5 different concentrations of lignosulfonate solution showed great values which 2% and 4% concentrated solution has the smallest amount of water content with high compaction value. About the Nalaikh soil sample, 2% and 4% solution on soil compaction test showed the smallest amount of water content with high compaction value. By using the proposed procedure to test lignosulfonate solutions, lignosulfonate 2% and 6% of solutions showed great result.

NYAMBAYAR GANPUREV – ГАНПҮРЭВИЙН НЯМБАЯР

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Master in Hydroscience and Engineering TU Dresden -
Дрездений техникийн их сургуульд усан шинжлэх ухаан, инженерийн чиглэлээр магистрын оюутан

Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг

- GMIT Scholarship Excellent Student, 2017- 2020 - 2017- 2020 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлэг
- DAAD scholarship, 2020 – 2020 онд Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

- Gatsuurt LLC - Гацуурт ХХК
- Tuya LLC - Туяа ХХК

Achievements during the study –
Суралцах хугацаанд гаргасан амжилт

Waste Management /Head of environmental club - Хүрээлэн буй орчны клубыг удирдаж сурч байх хугацаандаа хогны ангилан ялгалтыг сургуулийн хотхондоо багахан ч гэсэн таниулж хэрэгжүүлж чадсан.

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Heavy metal contamination of soils in the territory of Erdenet Copper-Molybdenum mine - Уулын Баяжуулах Эрдэнэт Үйлдвэр орчмын хөрсөн дэх хүнд металлын бохирдол

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The most distinctive feature of Erdenet Mining Corporation is its ancient establishment.
Correspondingly, its environmental impacts have been attracting researchers' interest for a long time. This study aims to examine heavy metal contamination in the vicinity of EMC based on the data obtained by using handheld XRF in the laboratory of GMIT. The research was carried out on 48 samples in the fall of 2020. Given that the number of samples and devoid of confirmatory analysis, the result of the present study is preferable to get a general picture of the contamination level.
The overall contamination of the study area was concluded to be Cu>Zn>As>Ni>Pb. Among the studied heavy metals, Cu was the most ubiquitous one, and the highest concentrations belonged to the tailings pond and the downwind area. The concentration ranged from 20-290 mg/kg in the study area. The current situation of the tailings pond making it an inevitable source of the above- stated metals since they are in the ore content. However, considering the natural setting of Erdenet as the tailings pond is located in the valley separated from the residential area by the mountain and the wind direction, the influence of white dust contamination in the residential area and the city center may not be such high. Additionally, the metals' concentrations can be found high in the non-downwind areas of the tailings pond and the open-pit mine like the residential and the other regions due to the parent rock characteristics or other sources of heavy metals, namely, the dirt road (motor transport), spontaneous garbage wastes on the streets, individual heating powered by
the brown coal during the cool seasons, and the thermal power plant.
Lastly, all in all, heavy metal contamination in Erdenet was not critical to take immediate measures except for the tailing pond in which sulfide-containing waste generates AMD resulted in low pH and high mobility of the heavy metals.

OYUNBAT BATZORIG – БАТЗОРИГИЙН ОЮУНБАТ

Graduated study program –Төгссөн мэргэжил

Industrial Engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Youth, digital media, activism coordinator at Amnesty International Mongolia - Монголын Эмнести Интернэшнлд Залуучууд, дижитал хэвлэл мэдээллийн хэрэгсэл, идэвхтэй үйл ажиллагааны зохицуулагч

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship 50% - МГТИС нэрэмжит тэтгэлэг 50%
- DAAD Scholarship, 2017-2019 - 2017-2019 онд Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Loro Piana Mongolia LLC -
- Лоро- Пиана Монгол ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. "Who Knows Chemistry Well" Chemistry Olympiad for National Competition, 2nd place, 2018 – 2018 онд "Химийг хэн сайн мэдэх вэ" химийн улсын олимпиадын 2-р байр,
2. Introduction to Electrical Circuits Olympiad for National Competition, 2nd place, 2019 – 2019 онд Цахилгаан хэлхээний үндэс улсын олимпиадын 2-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

The improvement of the particular driver training course through introduction of Total Quality Management - Сонгогдсон жолооны курсын сургалтыг нэгдсэн чанарын удирдлагын үндсийг нэвтрүүлэх замаар сайжруулах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The purpose of the research is to evaluate the current situation of Driver Training Courses (DTCs) in Mongolia and its programs. The paper analyses an overview of the related theories of Total Quality Management on the selected case. The key question is: "If the TQM's techniques are used, what changes, and progresses are made to the particular selected driver training course?"

The research is to study the current DTC's background, including characteristics, basic regulations, and standards-based on observation and scenario analysis and assumption. One of the TQM's experts, Crosby's 14 steps for quality improvement were used in the study. To contribute to the Quality improvement, empirical approaches such as questionnaires and self-made surveys were used as a second methodology.

The Driver Training Course market in Mongolia is very competitive, and there are many driver training courses without any differentiation in the market. The research study presented Implementation of Crosby's Fourteen steps in service industry, especially a driver training course can be really effective. According to the results of the research, consumers and employees would be the most valuable resource for improving the quality management in the organization

SARNAI AMARBAYASGALAN – АМАРБАЯСГАЛАНГИЙН САРНАЙ

Graduated study program –Төгссөн мэргэжил

Environmental Engineering - Хүрээлэн буй орчны инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

HSE coordinator at MCS property - М-Си-Эс Проперти ХХК-д ХАБЭА-ын зохицуулагч

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship, 2016, 2020 - 2016, 2020 онд МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD scholarship, 2017- 2019 - 2017- 2019 онд Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Energy Resource LLC - Энержи Ресурс ХХК
- Nisekh Wastewater treatment plant - Нисэхийн бохир ус цэвэрлэх байгууламж

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

4th National student research symposium of "Environmental Engineering", 3rd place, 2021 – 2021 онд Хүрээлэн буй орчны инженерчлэл үндэсний оюутны эрдэм шинжилгээ, онол, практикийн IV бага хуралд амжилттай оролцож 3-р байр эзэлсэн.

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Soil pollution risks associated to ash disposal and deposition in the ger districts of Ulaanbaatar - Улаанбаатар хотын гэр хорооллын үнсний хаягдал, тортогоос үүсч буй хөрсний бохирдлын эрсдэл

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The research is aimed to assess soil pollution risks due to ash disposal and deposition in ger districts of Ulaanbaatar. The study continued from November 2020 to May 2021. Ash samples were taken from Nalaikh raw coal ash and Tavan-tolgoi briquette ash, in total 12 samples were assessed. Soil samples were taken from the top soil of Ulaanbaatar, in total 10 samples were evaluated. Main soil pollution analysis indices, ecological impacts and human health impacts were examined in this study. Fly ash of Nalaikh raw coal was strongly contaminated by As and Pb in comparison with fly ash of Tavan-tolgoi briquette. As and Cd concentration on top soil of ger districts of Ulaanbaatar exceeded the permissible limit, however other elements were not listed in MNS 5850:2019. Total carcinogenic risk (TCR) and non-carcinogenic risks to children was beyond WHO recommended limit under ingestion and dermal contact pathways. For ecological risk assessment, Zn and As in fly ash of both coals showed very strong contamination indexes. Cd, As, and Pb are considered as higher ecological toxicity than other heavy metals in fly ashes.

Disposal and deposition of Nalaikh raw coal ash have more adverse consequences than Tavan-tolgoi briquette ash

UELUN MUNKHJARGAL – МӨНХЖАРГАЛЫН ӨЭЛҮН

Graduated study program –Төгссөн мэргэжил

Environmental Engineering
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

- Process Engineer at Khaanzaa Service LLC – Хаанзаа сервис ХХК-д Процессын инженер
- Master of Science in Resources and Technology at GMIT - МГТИС-ийн Байгалийн нөөц ба технологийн чиглэлээр шинжлэх ухааны магистрын оюутан

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Oyutolgoi LLC - Оюу Толгой ХХК
- Loro Piana Mongolia LLC - Лоро Пиана Монголиа ХХК

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT Excellent Student Scholarship, 2017-2018 - 2017-2018 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлэг
- Summer school scholarships in both Germany and China, 2018, 2019 - 2018, 2019 онд Герман болон БНХАУ дахь Зуны сургалтын тэтгэлэг
- DAAD Sur Place Scholarship, 2018-2021 - 2018-2021 онд Германы эрдмийн солилцооны албаны Sur Place тэтгэлэг

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. Founded "Morning Club" at MGTIS and worked as a club moderator for 4 years - МГТИС-д "Өглөөний клуб"-ийг үүсгэн байгуулж, клубийн удирдагчаар 4 ажил ажилласан.
2. Won gold and silver medals in basketball competition gold, silver and bronze medals in volleyball competition and silver medal in table tennis competition - МГТИС-ийн сагсан бөмбөгийн тэмцээнд багаар алт, мөнгөн медал, гар бөмбөгийн тэмцээнд багаар алт, мөнгө, хүрэл медаль, ширээний теннисний тэмцээнд мөнгөн медаль хүртэж байсан
3. Won 2nd place as a team in the first aid relay competition organized by the Red Cross among the districts of the eastern region - Улаан загалмайн нийгэмлэгээс зүүн бүсийн дүүргүүдийн дунд зохион байгуулсан анхны тусламжийн буухиа тэмцээнд багаар 2-р байр эзэлсэн
4. Lantuun Dohio" volunteered 200+ hours and won first place as a team in the New Signal-2 project competition - Лантуун Дохио ТББ-д 200+ цагийн сайн дурын ажил хийж, Шинэ дохио-2 төслийн уралдаанд багаар тэргүүн байр эзэлсэн

Bachelor thesis topic –Бакалаврын дипломын сэдэв

Study of Dissolved Air Flotation in wool scouring industrial
wastewater treatment – Ноос угаах үйлдвэрийн хаягдал усыг хөвүүлэн баяжуулах аргаар цэвэрлэх боломжийн судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

The most common type of textile industry in Mongolia is the wool scouring industry. Wool scouring wastewater discharge without treatment can cause irreparable environmental damages. The primary purpose of this thesis study is to study the treatment of wool scouring industrial wastewater using a combined coagulation and flocculation as well as Dissolved Air Flotation (DAF) processes.

In this thesis study, the DAF and coagulation and flocculation techniques were conducted on the lab scale. The wastewater sample is collected from Tuya LLC, the wool scouring industry in Ulaanbaatar, and used in this study. The Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and Total Suspended Solids (TSS) are determined in the sample to assess the wastewater treatment efficiency.

Batch experiments are conducted on different conditions of Poly Aluminum Chloride (PAC) and pH to determine the optimal condition, which is needed to identify the highest removal efficiency of parameters. According to the experimental result on the influent wastewater of Tuya LLC, the concentration of COD, BOD, and TSS should decrease at least by 71.49%, 6.98%, and 85.19%, respectively, to meet the requirements of MNS 2015:6561 standards. As a result of the DAF experiment, the COD and TSS concentrations on the effluent are 175.6 mg/L and 52.5 mg/L, which have the corresponding removal efficiency of 93.7% and 98.1 %.

Based on the study result, DAF is suitable for wool scouring wastewater treatment. The design parameters of the DAF tank are calculated successfully. To find out the optimal conditions of PAC and pH, a further number of experiments is required.

YELAMAN BYAMBAEV –
ЕЛАМАН БЯМБАЕВ

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering -
Механик инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Production Readiness Project Engineer at Oyu Tolgoi LLC -
Оюу Толгой ХХК-д Үйлдвэрлэлийн бэлэн байдлын төслийн инженер

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

ISDB Scholarship - Исламын хөгжлийн банкны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Barloworld Mongolia LLC - Барловорлд Монголиа ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. Basketball Championship of GMIT, 1st place, 2018 – 2018 онд МГТИС-ийн сагсан бөмбөгийн аварга шалгаруулах тэмцээний 1-р байр.
2. 3rd place of GMIT Symposium of Mongolia, 2017 - 2017 онд МГТИС-ийн оюутны бага хурал, 3-р байр

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Vibration Analysis for fault Detection of Automobile Engineer
Автомашины хөдөлгүүрийн гэмтлийг илрүүлэх чичиргээт шинжилгээ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This bachelor work reviews the analysis and diagnosis of automobile engines with the use of vibration. In recent years, it has been proven that vibration analysis is not only applicable for the fault detection of bearings and gears but also automobile engines. The aim of this research work is to monitor, diagnose and detect faults in an automobile engine by conducting vibration analysis. A professional car diagnostic tool was used in order to lower the costs of operation.

Moreover, vibration analysis was conducted to decrease the risk of catastrophic damage on automobile engines. Analysis was based on the measurement of the vibration data acquisition device. Spectrum analysis and Fourier Transform techniques were used to observe patterns in data. The research outcome is about automobile engine health and faults.

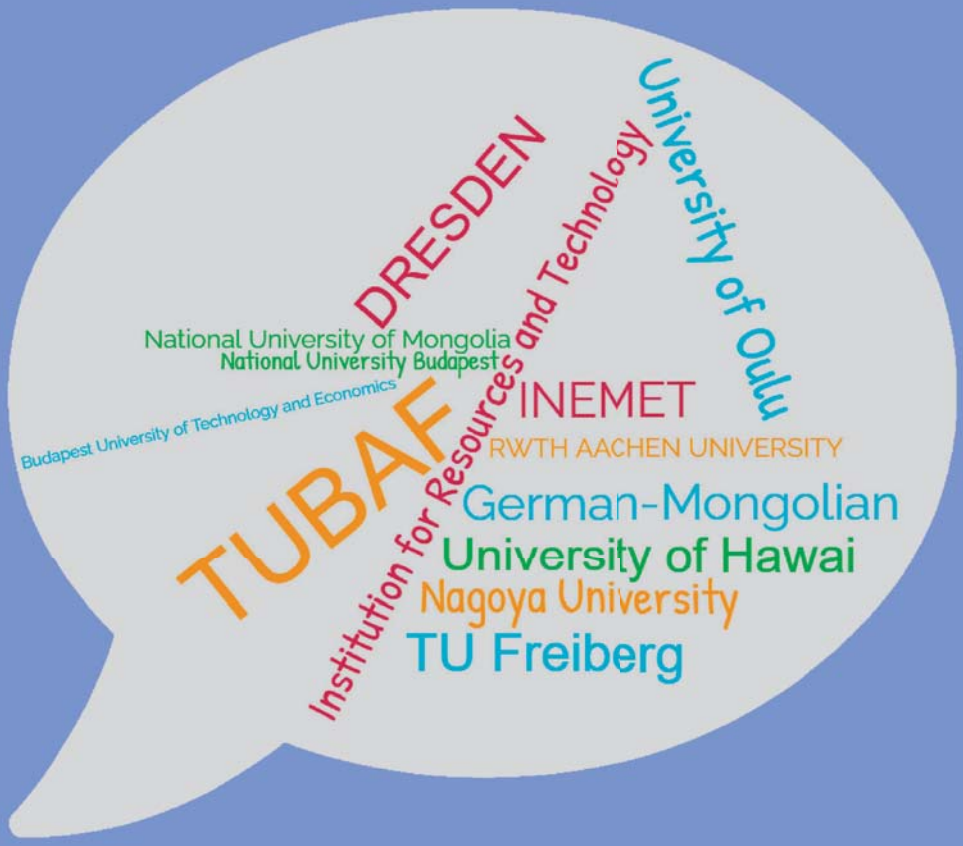
Vibration is a useful tool for identifying and diagnosing some early machine and equipment faults. It's possible that it's one of the languages through which the machine communicates its illnesses. In the frequency spectrum, each piece of mechanical equipment has an own signature. Vibration measurements are used to forecast issues by observing how they vary at different points along with the units. The experiment is conducted on the Toyota Rush and Toyota Highlander automobile engine. First experiment was tested successfully and reached the willing result. However, second experiment on the Toyota Highlander hybrid engine is go wrong due to the disengage of accelerometer wire. The vibration sensor is fixed on the most heat generated zone to collect the vibration data, because friction and mechanical wear are common causes of overheating, it is fair to pinpoint the overheated location. The sensor data is saved in the DreweSoftX2 application. These data are afterwards exported to Microsoft Excel.

The obtained data was visually rendered in Excel, displaying the vibration analyses' time domain. After that, The Fourier transformation was used to move the time domain into the frequency domain by rendering Excel data into MATLAB.

According to the results of the Toyota Rush engine testing thus far, the frequency-domain graph shows how much of the signal is distributed throughout each frequency band. From that around 22 hz have very high

amplitude on the graph. So, between the engine block and the engine piston, there was a lot of friction. The piston walls have a lot of wear on them. This issue might be the root of the odd engine vibrations. Engine blocks are often manufactured of tougher

Universities studying GMIT graduates for graduate studies – МҮТИС-ийн Магистрын хөтөлбөрт хамрагдаж буй их сургуулиуд



The Future We Create: Class of 2022

Ирээдүйг бид бүтээнэ

Graduated study program –Төгссөн мэргэжил
Raw Material Process Engineering - Эрдэс баялаг боловсруулалтын инженер
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Planner engineer - Төлөвлөлтийн инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT scholarship – МГТИС-ийн нэрэмжит тэтгэлэг
Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани
GCR LLC – Жи Си Ар ХХК
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Vibration Analysis for fault Detection of Automobile Engineer Автомашины хөдөлгүүрийн гэмтлийг илрүүлэх чичиргээт шинжилгээ

ANAND OYUNBAT – ОЮУНБАТЫН АНАНД

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Throughout the world, the reserves of metal ore deposits are dwindling, research into the extraction of metals from low grade deposits are becoming increasingly important. Low concentrations of Cu, Fe were analyzed in the Oyu Tolgoi Southwest deposit's Phase 4B ore, which is unsuitable to be extracted through flotation method. Bacterial cells have been shown to be capable of converting metals form solid to liquid phase in the bioleaching process. Particle size, pH, and pulp density are the most significant characteristics in bioleaching; thus, we focused our research on improving the solid-liquid phase ratio. The microorganisms Acidithiobacillus thiooxidans, both acidophilic and mesophilic, were used in this study. AAS analysis was used to determine the metal recovery in the leachate, while the residual metal concentrations in the insoluble form were determined through calculations. The solid-liquid phase ratios of 1:2, 1:4, 1:6 was investigated. The maximum Cu (0.5%) was observed at solid liquid phase ratio of 1:6, according to atomic absorption spectrometry (AAS) data.

ANKHCHIMEG GANZORIG – ГАНЗОРИГИЙН АНХЧИМЭГ

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Oyu Tolgoi LLC - Оюу Толгой ХХК

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship, 2018 – 2021 – 2018 – 2021 онд МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD Sur-Place Scholarship, 2021-2022 – 2021-2021 онд Германы Эрдмийн Солилцооны Sur-Place Тэтгэлэг
- "Leaders of Tomorrow" APU company Scholarship, 2021-2022 – 2021- 2022 онд АПУ компани нэрэмжит Маргаашийн Манлайлагчид Тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Nalaikh Vocational Training Center - Налайх МСҮТ
- Central Geological Laboratory - Геологийн төв лаборатори
- Soyolon International LLC - Соёолон Интерншинл ХХК
- Oyu Tolgoi LLC - Оюу Толгой ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Research Grant of Ministry of Education and Science and Erdenes Tavan Tolgoi LLC - БСШУЯ болон Эрдэнэс Таван Толгой ХХК нэрэмжит Судалгааны Тэтгэлэг
2. "Research of upgrading coal quality from Tavan Tolgoi Mining through a dry method" speech and paper at "Coal Enrichment 2021" Theory and Practice Conference and "Enrichment" Journal - "Нүүрс Баяжуулалт 2021" онол практикийн бага хурал "Таван Толгой ордын нүүрсийн чанарыг хуурай аргаар сайжруулах судалгаа" илтгэл болон "Баяжуулагч" сэтгүүлд нийтлэл хэвлүүлсэн
3. Project assistance of ADRIANA project-Reprocessing of copper from the Erdenet mine tailing - "ADRIANA" Эрдэнэт уурхайн Хаягдлын Даланг Дахин Боловсруулах төслийн туслах

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Reprocessing of tailing from Erdenet copper ores: Optimization of the chemical reagents for the flotation - Эрдэнэт үйлдвэрийн хаягдлын далангаас зэс дахин боловсруулах боломж: Флотацийн химийн урвалжийн оновчлол.

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

In the Erdenet copper-molybdenum mine, effluents from the flotation of copper have been stored tailings storage facility. After the flotation process, the gangue minerals are present in tailings and the exposed metals of interest. Tailings may have copper at amounts that are recoverable in some instances.
The thesis is being piloted as part of the ADRIANA project to study the possibility of flotation processing of copper sulfide in the 18 $km2$ tailings dam of Erdenet copper-molybdenum concentrator which has been operating since 1978. The main and interaction effects of chemical reagent (collector and frother) dosages on the copper flotation performance were examined and optimized dosages of reagents were specified.

The effect of dosages was studied by flotation tests with two stages (rougher and scavenger flotation) using two types of frothers (OTZ-100 and MIBC), three types of primary collectors (MONFLOTH-03, AEROPHINE-3422, AEROMX-5252) with different dosages, and other fixed parameters. After that additional flotation tests were performed at pH 9.5, 10, and 10.5 to find the appropriate pH condition. To decrease oxidized copper content in the tailing of flotation tests, the final flotation with an activator or sulfidizer (Na2S) was added to the scavenger stage. This resulted in a copper grade of 1.41% with a recovery of 32.27%. The experiment lasted a total of six months.

In conclusion, the research study can be significantly valuable for choosing efficient processing methods and developing reprocessing plant design for Erdenet mine tailing. The reprocessing of tailings from the Erdenet mine through flotation is one of the approaches enabling the mineral processing sector to reduce its environmental impact, it may also help to conserve resources by recovering metals from metallurgical waste. However, based on the performance of the final optimal flotation, reprocessing the sulfide mineral from tailing is not the best optimal choice.

ANUJIN MUNKHNASAN – МӨНХНАСАНГИЙН АНУЖИН

Graduated study program –Төгссөн мэргэжил

Raw Material Process Engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Graduate Chemical engineer at the Concentrator Technical services department of Oyu Tolgoi LLC - Оюу Толгой компани - Баяжуулах үйлдвэрийн техникийн үйлчилгээний хэлтэст "Шинэ төгсөгч Химийн инженер"

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship 50% - 2 times, 2018 – 2018 онд МГТИС-ийн нэрэмжит тэтгэлэг 50% - 2 удаа
- DAAD Sur Place Scholarship - 4 times - Германы эрдмийн солилцооны албаны Sur Place тэтгэлэг - 4 удаа.

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Central geological Laboratory - Геологийн төв лаборатори
- Khan lab - "Хан Лаб" ХХК
- Soyolon International LLC - "Соёолон Интернэйшнл" ХХК
- МГТИС-ийн боловсруулалтын лаборатори
- GMIT mineral processing laboratory - МГТИС-ийн боловсруулалтын лаборатори;
- Oyu Tolgoi LLC - Оюу Толгой ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Representing Mongolia in the 2021 Study of the U.S. Institutes (SUSI) for Student Leaders on Women's Leadership exchange program - 2021 онд АНУ-ын Манлайлагч оюутны хүрээлэнгээс Эмэгтэйчүүдийн манлайлал солилцооны хөтөлбөрт Монгол Улсыг төлөөлөн оролцсон
2. Research grant of "the project to improve the quality of coal at the "Erdenes Tavan Tolgoi" LLC by dry processing method" from the "Erdenes Tavan Tolgoi" LLC project competition as a team - Эрдэнэс Тавантолгой ХХК-ийн төслийн уралдаанаас багаараа "Эрдэнэс Тавантолгой" ХХК-ийн нүүрсний чанарыг хуурай аргаар баяжуулах төсөл"-ийн судалгааны тэтгэлэг
3. 4th place in the National Students Physics II and III Olympiad - 2 times – Физикийн улсын II, III олимпиад 4-р байр 2 удаа
4. Founder/moderator of the Lava Volunteer club of the GMIT (2017-22) – Лава сайн дурын клубын үүсгэн байгуулагч

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Primary grind and Rougher recovery relationship of southwest deposit of Oyu Tolgoi ore: Phase 4B high-grade gold - Монголын аж үйлдвэр дэх "Тогтвортой нийлүүлэлтийн гинжин хэлхээний удирдлагын систем" -ийн төлөв байдал болон боломжууд

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

The objective of this study was to investigate the effect of different primary grind sizes for the Cu (copper) and Fe (iron) recovery of the Phase 4B high-grade gold ore, which is from the southwestern deposit of the Oyu Tolgoi deposit. A series of nine rougher flotation tests have been completed to assess the primary grind size at the Mineral Processing laboratory of German-Mongolian Institute for Resources and Technology. Three sizes, which are a P80 of 54μm, 106 μm and 212 μm were chosen for testing the relationship between P80 particle size and rougher recovery under the same condition. In this Bachelor thesis, the relationship between primary grind and rougher recovery of ore from the southwestern deposit of Oyu Tolgoi ore was investigated, which is the high-grade gold ore of Phase 4B. The Southwest deposit is in the gold-rich porphyry category and is an ore body approximately 250 meters in diameter and more than 700

meters in vertical extent. Main ore minerals are chalcopyrite and bornite. The Oyu Tolgoi concentrator plant's strategy for processing the ore is to operate at lower pH to maximize gold recovery in the froth flotation. Furthermore, the copper grade in the final concentrate depends on the P80 particle size. Hence, it is important whether the current P80 particle size of the phase 4B high-grade gold ore is optimal. With the exception of Au, the various p80 effects for the Cu and Fe recovery of the high-quality ore of the phase 4B high-grade gold ore are only determined. Because the gold (Au) mineral has a detection limit of around 100 ppm on the Thermo Scientific Niton XL2 XRF Analyzer, which was employed in the study's X-ray fluorescence quantitative elemental analysis. Furthermore, the phase 4B high-grade gold ore has 0.44 ppm of Au according to the Oyu Tolgoi test work of "Head assay" experiments of the Oyu Tolgoi deposit at the Mineral Processing laboratory of GMIT in August, 2021, where I worked as an intern. So, the effects of different primary grind sizes on Fe recovery of the Phase 4B high-grade gold ore are also being investigated due to the detection limit of Au, gold on the Thermo Scientific Niton XL2 XRF analyzer.

In conclusion, increasing the primary grind size causes the Cu tailing grades to increase.

Graduated study program –Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT Excellent student 25%, 2020 – 2020 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлдэг 25%
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Determination of heavy metal concentration of surface water in Nalaikh area and the study of its reduction methods - Налайхын гадаргын усны хүнд металлын агуулгыг тодорхойлох болон түүнийг бууруулах аргын судалгаа

ANUUJIN BAYANSAN
БАЯНСАНГИЙН АНУУЖИН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

This study aims to assess heavy metal pollution in surface water in Nalaikh, Mongolia. Sampling locations are taken from Bus Lake, polishing pond in Gorod WWTP, runoff, and shallow lagoon. Bus lake was used for traditional treatment and some types of birds such as gulls etc inhabit and drink. The runoff and shallow lagoon were only taken for observing the content of arsenic and chromium.

The research work continued from November 2021 to April 2022. In this thesis study, the determination of arsenic concentration was examined in laboratories by using spectrophotometric methods and ICP-MS equipment. The first arsenic concentration examination was determined in the laboratory with ICP-MS equipment in November and February (SGS laboratory). Overall of arsenic concentration determined with licensed laboratory is 0.32875 ppm, 0.018ppm, 1.1 ppm and 0.0083 ppm, respectively. Overall of arsenic concentration determined with spectrophotometric method is 0.32 ppm, 0.4095 ppm, NA, and 0.2135ppm, respectively. The most polluted location is Gorod's polishing pond. It is because the wastewater from WWTP adds up to the pond. The second polluted location is Bus lake. Thus, in order to reduce arsenic concentration, the first used method is adsorption and the adsorbent material is spent coffee ground. The reason why using the spent coffee ground for adsorbent is environmentally friendly and is a secondary raw material. Unfortunately, this method is not appropriate for arsenic concentration and also it increases the other content of samples. Thus, the electrocoagulation method was more efficient for arsenic concentration moreover for heavy metals. The test for reducing the content of as (V) by electrocoagulation is successfully carried out in solution. The As (V) value's 99.1% to 99.5% precipitated.

Graduated study program –Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
GMIT "Leadership" scholarship, 2021 – 2021 онд МГТИС-ийн нэрэмжит "Манлайлагч оюутан" тэтгэлэг
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Experimental analysis on backfilling rehabilitation with Coal Combustion By-Products (CCBs) for abandoned Small Scale Coal Mines - Орхигдсон бичил уурхайн нөхөн сэргээлтэд нүүрсний үнсээр дүүргэлт хийх турштлтын шинжилгээ

BAIGALI LKHAGVAJAV – ЛХАГВАЖАВЫН БАЙГАЛ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

This thesis focused on experimental analysis of the rehabilitated area in the abandoned small-scale coal mine in the Nalaikh mining area. The soil analysis is conducted at several spots in the rehabilitated shafts since the impacts of the rehabilitation by backfilling method could be more detectable in soil than in the water and air environment. Additionally, backfilling method of coal fly ash and mining reclamation were researched and mentioned, including a review of Mongolian examples of the backfilling method and the BASMIC project.

The rehabilitated area of Nalaikh mining has a neutral pH environment and loamy sand soil texture that is not suitable for growing plants. The mean value of the pH environment is 7.5 in the rehabilitated area. The concentration of heavy metals was determined to evaluate the pollution level. In most cases, the content of elements did not exceed maximum permissible values. It was contaminated by copper, zinc, and arsenic. Zinc concentration (610 mg/kg) of spot A01 is 4 times higher than the topsoil of reference soil sample and almost 2 times higher than Mongolian standard. The area which contains the maximum (430 mg/kg) value of Cu is A06, around the landfill area of the Nalaikh district. Comparing to the reference soil, arsenic pollution is 2 times high at spot A01 due to the fly ash of the power plant. As for the lead pollution, maximum concentration is 120 mg/kg at spot A05. Compared to the reference topsoil, it is 12 times higher. Spot A05 is located just next to the mine hole, collapsed construction and the road. Those are the main reasons of pollution including residue of coal mine, construction materials, car emissions so on.

BAIGALMAA PUREVDORJ – ПҮРЭВДОРЖИЙН БАЙГАЛМАА

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering -
Механик инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Oyu Tolgoi LLC – Оюу Толгой ХХК

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- Excellent Student Scholarship, 2018 – 2018 онд МГТИС-ийн нэрэмжит Шилдэг оюутан
- DAAD Surplace Scholarship, 2018, 2021 – 2018, 2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг
- Summerschool scholarship, 2019 – 2019 онд Зуны сургалтын тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Sankou Tech Mongolia LLC - Санкоу Тек ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. GMIT Volleyball Competition - 1st snd 2nd place in 2019, 2020 – 2019, 2020 онд МГТИС-ийн гар бөмбөгийн тэмцээнд 1 ба 2-р байр.
2. Unleash hackathon - 3rd place in 2021 - 2021 онд Unleash hackathon – 3-р байр

Bachelor thesis topic –Бакалаврын дипломын сэдэв

The optimal sensor placements for vibration-based damage detection of wind turbine tower - Салхин сэнсний цамхгийн чичиргээнд суурилсан гэмтэл илрүүлэх мэдрэгчийн оновчтой байрлалыг олох нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Objective of this thesis is to find optimal sensor placements regarding vibration-based damage by utilizing modal parameters of a structure. The location of sensors is crucial for correct identification of the mode shapes of complicated mechanical structures. In this study, a specific model of a 100m wind tower was analyzed to determine the optimal sensor placement algorithm for vibration-based damage detection. The vibration-based damage detection was conducted to the system and damage was localized using a mode shape-based damage identification technique. The optimal sensor placements were obtained by minimization of weighted off-diagonal elements, QR decomposition, the genetic algorithm with maximum error and the genetic algorithm with weighted off-diagonal criteria. Among these three algorithms, the genetic algorithm with weighted off-diagonal criteria yielded the most effective sensor placements for the highest damage detection accuracy.

BILEGSAIKHAN SAINBILEG – САЙНБИЛЭГИЙН БИЛЭГСАЙХАН

Graduated study program –Төгссөн мэргэжил

Industrial engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Monnis Service Support LLC – Моннис Сервис Саппорт ХХК

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship, 2017 – 2017 онд МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD scholarship, 2018, 2019 - 2018, 2019 онд Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

Monnis LLC - Моннис ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

Mongolian Engineering Olympiad team competition 1st place, 2018 – 2018 онд Монголын инженерийн олимпиад 1-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Defining main prioritized remedial actions of maintenance using root cause analysis on mining equipment - Уул уурхайн тоног төхөөрөмжийн эвдрэл гэмтлүүдэд суурь шалтгааны анализ хийж, суурь шалтгааныг ач холбогдлоор нь эрэмблэн арилгах арга замыг тодорхойох

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

Maintenance accounts for the largest portion of mining's controllable operating cost. In this thesis, a methodology to define prioritized remedial actions for failures using FMEA, as root cause analysis, is proposed, covering 4 main phases: Problem area identification, Downtime priority determination, Candidate equipment selection, Determination, and analysis (FMEA) of failure modes for selected equipment. The data used in the thesis was real-time data of Monnis Mining LLC, one of the Mongolian coal mining companies. Multiple failure analysis techniques can be found in the literature. In this thesis, the logarithmic scatter plot of mean time to repair vs failure frequency was employed to categorize failures into acute and chronic failures. Through the use of a logarithmic scatter plot, the identification of problems affecting fleet availability, reliability, and maintainability was determined. To determine maintenance priority, the economic consequences of failure were considered. Due to the fact that, at the time of writing, the coking coal price was at a five-year high, production was prioritized over maintenance cost, hence availability and reliability over maintainability. The maintenance priority was then used to define a prioritized list of component failures and these failures were considered to be critical component failures. The most critical components were steering and final drive, having the highest downtime contribution. The critical component failures were used as a base for selecting candidate equipment for FMEA and TR3105 was chosen for the purpose as it was contributing one-third of total downtime caused by braking system failure for the whole fleet and had the highest number of critical component failure frequency. From the analysis, the notable thing was that most of the critical failures were occurring on specific equipment. Therefore, it can be concluded that these failures were not common characteristics for the whole fleet and it could be desirable to mitigate the effects of critical failures equipment by equipment for the case study, instead of taking an action for the whole fleet. After the equipment was chosen for the analysis, the FMEA worksheet was used for the analysis. In the worksheet, the failure modes of candidate equipment were determined and for each of them, the risk priority number (RPN) was calculated to prioritize these failure modes. But the remedial actions for these failure modes were not identified since the goal of the thesis was to only propose a methodology to define prioritized remedial action, moreover, the FMEA is a team-based project and needs a variety of perspectives and experience, especially on mechanical engineering in which the writer lacks knowledge. But having a prioritized list of failure modes means having a prioritized list of remedial actions. Thus, the thesis work did not go further as it reached the goal.

BILGUUNDALAI BATKHUYAG – БАТХУЯГИЙН БИЛГҮҮНДАЛАЙ

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Environmental consultant, specialist - Байгаль орчны зөвлөх, мэргэжилтэн

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT excellent student Scholarship 100%, 2019 – 2019 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлэг 100%,
- GMIT Summer School scholarship at TU Bergakademie Freiber, Germany, 2019 – 2019 онд Фрайберг их сургуулийн Зуны сургалтын тэтгэлэг
- DAAD Surplace Scholarship, 2021 -– 2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Central geological laboratory - Геологийн төв лаборатори
- Clean Energy Asia LLC - Клин Энержи Ази ХХК
- Bayalag ECO LLC - Баялаг Эко ХХК

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Assessment of soil erosion and geomorphological mapping in and around Baganuur using satellite-based data - Багануур орчмын хөрсний элэгдлийн тархац болон геоморфологийн зураглалыг сансрын мэдээ ашиглан тодорхойлсон судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Satellite photography and remote sensing in general are becoming more important not only in the environmental sciences, but also in other fields such as economics, engineering, politics, archeology, and so on. As a result, this thesis will use satellite imagery and remote sensing to investigate erosion and geomorphology in the remote area of Baganuur, which houses one of Mongolia's largest open cast coal mines. The mine supplies a significant amount of coal to Ulaanbaatar's main thermal power plants, and while past examinations have revealed a link between the mine and pollution, most of the studies were conducted within the mine and not outside of it.

The RUSLE equation used to calculate soil erosion in the Baganuur area in July and October of 2018 showed that the Baganuur region was under low risk of erosion hazard from rainfall and runoff. In addition, the method was also able to identify the difference of erosional rate between different seasons. The second goal of creating a geomorphological map was completed using a morphometric technique. There are 10 different landform classes and five different sub-basins in the Baganuur area.

Furthermore, the CORONA satellite picture, which had been georeferenced to aid in the geomorphological study, was discovered to be ineffective and could only be used in a limited way at this time

BOLORCHIMEG TURKHUU – ТӨРХҮҮГИЙН БОЛОРЧИМЭГ

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

- BGM Distribution LLC – "Би Жи Эм" Дистрбюшн ХХК
- Studying in the master's program "Hydroscience" at NUM Монгол улсын их сургуулийн "Ус судлал"-н Магистрийн оюутан

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

GMIT scholarship, 2018 – 2018 онд МГТИС-ийн нэрэмжит тэтгэлэг
DAAD scholarship, 2021 – 2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- KhanLab LLC - Хан Лаб" ХХК,
- BGM Distribution LLC - Би Жи М Дисртибюшн ХХК
- APU LLC - АПУ" ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. "Easter video competition"-4th place, 2020 - 2020 онд "Улаан өндөгний баярын видео тэмцээн"-4-р байр,
2. 5th Annual Conference of Mongolian Society of Environmental Engineers & Professionals, 2022 - 2022 онд, 2nd place, - Монголын байгаль орчны инженер, мэргэжилтнүүдийн нийгэмлэгийн V чуулган - 2-р байр

Bachelor thesis topic –Бакалаврын дипломын сэдэв

Assessment of Land Use effects on Tuul River surface water Quantity and Quality - Туул голын гадаргын усны урсац болон чанарт үзүүлж буй газар ашиглалтын нөлөөллийн үнэлгээний судалгаа

ABSTRACT OF BACHELOR THESIS:

The Tuul river basin is a unique region in that it covers only 3.2% of Mongolian territory, but 48% of Mongolian total population lives in Ulaanbaatar. Also, 66.5% of the Mongolian total GDP was produced within this river basin in 2020. Land-use changes due to the expansion of urbanization can pose a threat to downstream ecosystems of the Tuul river, particularly soil and water quality, leading to an increase in surface runoff and nutrient loads. The main purpose of this study is to evaluate the impacts of land-use and land cover changes in discharge and water quality in the upper part of the Tuul river basin between 2010 and 2019. Land use/land cover changes, digital elevation model, soil, and meteorological data were used as an input data for the Soil and Water Assessment Tool (SWAT) to simulate streamflow and water quality.

The model's performance was determined by statistical parameters including Nash-Sutcliffe efficiency coefficient (NSE), correlation coefficient (r), and percentage bias (PBIAS). Furthermore, prediction uncertainty was measured using the p-factor and r-factor. The values of NSE (0.56 and 0.66) and r (0.77 and 0.82) for calibration and validation periods at a daily time scale showed that the SWAT model could be used to simulate the discharge. The results of calibrated model showed the increase in surface runoff, and loads of nitrate and phosphorus due to rapid urbanization in the Tuul river basin. The outcomes of the study can be useful in understanding water management strategies and making more appropriate land management decisions and practices.

Бакалаврын ажлын хураангуй:
Туул голын сав газар нь Монгол улсын төв хэсэгт оршдог бөгөөд нийт газар нутгийн дөнгөж 3.2 %-ийг

эзлэх хэдий ч тус сав газарт 2020 оны байдлаар Монгол орны нийт хүн амын 48 % нь Улаанбаатар хотод төвлөрөн суурьшиж байна. Мөн 2020 оны байдлаар тус сав газрын хэмжээнд дотоодын нийт бүтээгдэхүүний 66.5 %-ийг үйлдвэрлэсэн. Дээрхи үзүүлэлтээс үзэхэд тус сав газар нь Монгол улсын эдийн засгийн хувьд үр ашигтай, хүн амын хувьд төвлөрөл ихтэй цаашид ач холбогдол нь улам нэмэгдэх хандлагатай бүс нутаг юм. Нөгөөтэйгүүр хүн амын хурдацтай өсөлт болон хотжилт нь Туул голын сав газрын урсацын хэмжээ, усны чанар болон экосистемд сөргөөр нөлөөлж байна. Уг судалгааны ажлын гол зорилго нь ArcSWAT гадаргын усны загварчлалын тусламжтайгаар газар ашиглалтын өөрчлөлт Туул голын сав газрын усны чанар болон урсацад хэрхэн нөлөөлж буйг үнэлэх юм. Судалгааны ажлын хүрээнд 2010, 2015, 2019 оны газар ашиглалтын ангиллын мэдээг сургалттай ангиллын аргаар, сав газрын өндрийн тоон мэдээ, хөрсний ангилал болон 2004-2019 оны цаг уурын (хур тунадас, нарны цацраг, агаарын температур, харьцангуй чийгшил, салхины хурд) өдөр тутмын хэмжилтийн мэдээг тус тус загварчлалын оролтын форматаар бэлтгэж загварыг ажиллуулсан. Нийт 17 параметрийг судалгааны талбайд сонгон авч холбогдох зүгшрүүлэлт, мэдрэмтгий байдлын дүн шинжилгээ болон баталгаажуулалтыг хийж Туул голын гадаргын усны нөөцийн тооцооллыг хийсэн болно. Загварын гүйцэтгэлийг НашСутклиффийн коэффициент (NSE), корреляцийн коэффициент (r), хувийн хазайлт (PBIAS) зэрэг статистик үзүүлэлтээр тодорхойлсон. Мөн, таамаглалын тодорхойгүй байдлыг p-фактор ба r-фактор ашиглан хэмжсэн. Шалгалт болон баталгаажуулалтын хугацаанд Туул-Улаанбаатар ус судлалын харуул дээр хэмжсэн болон тооцоолсон утгуудыг харьцуулахад NSE (0.56 ба 0.66) ба r (0.77 ба 0.82) утгууд тус тус гарсан нь ArcSWAT гадаргын усны загварчлалаар тооцоолсон гадаргын урсац болон хэмжсэн урсцын хоорондын хамаарал сайн буйг илэрхийлж байна. Энэхүү үр дүн нь тус загварчлалаар цаашид Туул голын гадаргын усны нөөц болон горимд үзүүлэх газар ашиглалтын өөрчлөлтийн нөлөөллийн үнэлгээг хийх боломжтойг харуулж байна. Загварчлалын үр дүнгээс харахад газар ашиглалтын хурдацтай өөрчлөлтийн улмаас гадаргын шууд урсац нэмэгдэн, түүгээр зөөгдөх бохирдуулагчийн хэмжээ мөн адил нэмэгдэж байна. Судалгааны үр дүн нь усны менежментийн стратегийг ойлгох, газар ашиглалтын менежментийн илүү оновчтой шийдвэр, практикийг гаргахад тус болох юм.

BUYANBILIG NAMNANSUREN – НАМНАНСҮРЭНГИЙН БУЯНБИЛИГ

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Mongolian National Chamber of Commerce and Industry -
МҮХАҮТ- Монголын Үндэсний Худалдаа Аж Үйлдвэрийн Танхим

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT Excellent Student Scholarship - МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- DAAD Surplace scholarship, 2021 – 2021 онд Германы эрдмийн солилцооны албаны Surplace тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

The Water Services Regulatory Commission /WSRC/ - Хот, суурины ус хангамж, ариутгах татуургын ашиглалт үйлчилгээг зохицуулах зөвлөл

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. "Material Science 2019" first material science symposium and won 1st place - 2019 онд Материал судлалын анхдугаар бага хурал 1-р байр
2. Awarded research grants from Erdenes Tavan Tolgoi LLC of 5 million tugriks- Bio leaching project - Эрдэнэс Тавантолгой ХХК-аас - Био уусгах төсөл дээр 5 сая төгрөгийн судалгааны тэтгэлэг авсан
3. "Long-term greenhouse gas trends, future predictions, and impacts on warming in the Gobi region of Mongolia" article in 'Environmental Engineers- 2022' scientific research and won 1st place - "Монгол орны говийн бүсийн хүлэмжийн хийн цаашдын чиг хандлага, ирээдүйн таамаглал, дулааралд үзүүлэх нөлөө" нийтлэлийг "Байгаль орчны инженерүүд-2022" эрдэм шинжилгээний судалгаанд оруулж, 1-р байр эзэлсэн.
4. GMIT Basketball competition- 3gold, 2bronze medals, and 2 times MVP of basketball – МГТИС-ийн сагсан бөмбөгийн тэмцээнд- 3 алт, 2 хүрэл медаль, сагсан бөмбөгийн 2 удаагийн Улирлын шилдэг тоглогчоор шалгарсан
5. GMIT Volleyball competition- 2 gold medals and MVP of volleyball – МГТИС-ийн волейболын тэмцээнд- 2 алтан медаль, волейболын Улирлын шилдэг тоглогчоор шалгарсан
6. NMIT& GMIT Basketbal Competition- 2 gold medals – Шинэ Монгол Технологийн дээд сургууль болон МГТИС-ийн хооронд болсон тэмцээнд 2 алтан медаль

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Long-term trends of greenhouse gases in an arid and semi-arid area of Mongolia and its relationship with temperature - Монгол орны хуурай, хагас хуурай бүс нутгийн хүлэмжийн хийн урт хугацааны чиг хандлага, түүний температурын хамаарал

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Over the past few decades, the Earth's climate has been dramatically changing due to anthropogenically-induced greenhouse gases. CO2, CH4, N2O, and SF6 concentrations have been continuously increasing. In this study, 29-year measurement data was used to conduct basic research covering several aspects including general characteristics of greenhouse gases, their climate radiative forcing, and relevance to temperature. A particular investigation was done on a variety of analyzes such as time series, seasonal changes, future forecasts, and temperature correlation. Using the statistical model, By 2033, the concentrations of greenhouse gases in Mongolia are predicted to increase by 3-12.1% compared to the current level. In Mongolia, 73.4% of the climate radiative forcing is CO2, 19.6% is CH4, 6.64% is N2O, and 0.35% is SF6.

Furthermore, the relationship between greenhouse gas and temperature showed that CO2 and CH4 have the highest correlation (0.42 and 0.41) during the study period.

CHINSANAA BATKHUYAG – БАТХУЯГИЙН ЧИНСАНАА

Graduated study program –Төгссөн мэргэжил

Raw Materials and Process Engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Technical Assistant at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Техникийн туслах ажилтан

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

GMIT Excellent student scholarship, 2021, 2022 – 2021, 2022 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- RC Inspection Asia Assayers LLC – Ар Си Инспекшн ХХК
- Soyolon International LLC - Соёолон ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Club council founder - Клубын зөвлөл байгуулан ажилласан
2. Research grant of "the project to improve the quality of coal at the "Erdenes Tavan Tolgoi" LLC by dry processing method" from the "Erdenes Tavan Tolgoi" LLC project competition as a team - Эрдэнэс Тавантолгой ХХК-ийн төслийн уралдаанаас багаараа "Эрдэнэс Тавантолгой" ХХК-ийн нүүрсний чанарыг хуурай аргаар баяжуулах төсөл"-ийн судалгааны тэтгэлэг
3. Awarded a place in school sports events every year - Сургуулийн спорт арга хэмжээнд жил бүр шагналт байр эзэлсэн

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Chemical and physical property of copper powder and its production possibility - Нунтаг зэсийн хими физик шинж чанар болон үйлдвэрлэлийн боломжууд

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Metal component applications are increasingly being produced via powder metallurgy in the industry nowadays. Powder metallurgy is extremely cost-effective in terms of manufacturing and material utilization. Low production costs, improved energy efficiency, and the ability to combine elements that are known to be incompatible are some of the advantages powder metallurgies has over conventional manufacturing techniques such as casting and forging. Powder metallurgy has become popular for treating both traditional and modern materials due to these advantages.

This thesis work is limited to an experimental work with inducted coupled plasma spectroscopy (ICP) and X-ray diffraction analysis (XRD) in order to determine flow rate, particle size, density and oxygen content with following copper content on copper powder sample. Inducted coupled plasma spectroscopy is a sophisticated chemical analysis approach that can identify tiny levels as well as significant concentrations of practically all components in sample, in material science, XRD's purpose is to determine the material's crystallographic structure. XRD technique involves irradiating the material with incoming X-rays afterwards determining the intensity and scattered the angles of the X-rays that exit the substance.

Based on the chemical and physical properties of powdered copper, the purpose of this thesis work is to find a way to produce domestically produced, value-added products in Mongolia and to increase exports to expand gross domestic product.

Graduated study program – Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Study of Spatial Variations of Air Pollutants in Ulaanbaatar - Улаанбаатар хотын агаар бохирдуулагч бодисын орон зайн өөрчлөлтийн судалгаа

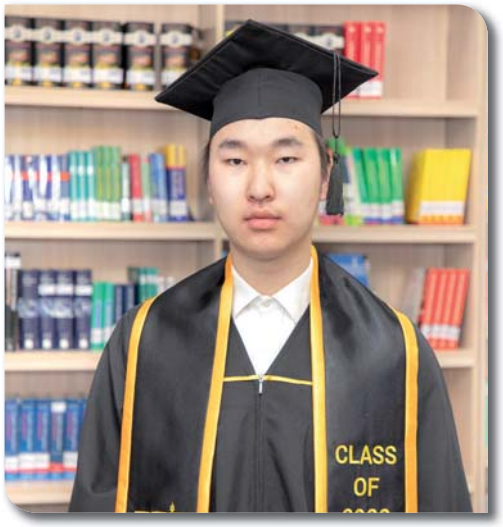
DAGIISUREN BADAMKHATAN – БАДАМХАТАНЫ ДАГИЙСҮРЭН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Long-term air pollution data with spatial resolutions are needed to aid in the research of Ulaanbaatar's air quality and to discover which residential areas have higher pollutant levels. However, until recently, similar study was rare in Mongolia. This study examines the spatial variations of PM2.5, PM10, CO, SO2, NO2 and O3 in 13 monitoring stations in Ulaanbaatar between January 2014 and December 2020. For the overall averaged pollutant values in all stations, they exceeded the Mongolian National Standard for PM10, PM2.5, SO2, and NO2, while O3 and CO were provided that standard (MNS 4585:2016) and their highest occurrences were 94.7%, 95.6%, 50.6%, 42.4%, 90.5%, and 34.75%, respectively, higher than the daily average MNAQS.

According to the characteristics of pollutants at different site, the highest concentrations of PM10, PM2.5, SO2, and CO were mostly researched in Ger areas. Whereas the concentrations of O3 and NO2 were highly occurred in traffic areas. The seasonal analysis was investigated that the hazardous levels are reached in winter and then the concentrations were decreased for until autumn, not including with ozone. Because there hasn't been a solid link between ozone levels and seasonal changes. Even though pollutant concentrations were decreased in the summer, some contaminants in categorized groups remained high and did not meet the allowed threshold, especially in PM10.

According to the distribution analysis, 66 percent of air pollutants from the ger area come from there. However, in residential areas, the highest figure in the measurement of NO2 pollution was observed in all of the stations from the evaluation. Despite the fact that the most harmful pollutants, the highest evaluation PM10 and SO2, were studied in ger areas, the pollutants' distribution at all places generally identical.



DUGAR DAVAAJARGAL – ДАВААЖАРГАЛЫН ДУГАР

Graduated study program –Төгссөн мэргэжил

Raw materials and process engineering -
Эрдэс баялаг боловсруулалтын инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Process engineer at Energy Resources LLC -
Энержи Ресурс ХХК-д Боловсруулалтын инженер

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT Exellent Student scholarship, 2018-2021 - 2018-2021 онд МГТИС-ийн нэрэмжит Шилдэг оюутан тэтгэлэг
- Grant research of ETT LLC – Эрдэнэс Таван Толгой ХХК, Судалгааны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Khanlab LLC - Хан Лаб ХХК
- Soyolon LLC - Соёолон ХХК
- Process laboratory of GMIT - МГТИС-ийн Боловсруулалтын лаборатори

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

Christmas charity competition-volunteer project - Зул сарын буяны уралдаан-сайн дурын төсөл

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Study of reprocessing copper tailings from Erdenet mine based on optimization of P80 grind size for the flotation -
P80 нунтагласан ширхэглэгийн хэмжээг флотацид онвчилсны үндсэн дээр Эрдэнэтийн зэсийн хаягдлын даланг дахин боловсруулах судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

This thesis paper is carried out as an extended part of the “Adriana” project. The study of the possibility of reprocessing the tailings from Erdenet copper and molybdenum mining company by the mechanical flotation process is investigated. Regarding the historical data of the EMC LLC, the copper content in the tailing was above 0.1% due to operational activity and lack of technology in previous years. Within this thesis work, grinding times for the P80 grind sizes of 75, 54 and 38 μm are determined. Also, flotation tests on these various sizes with an initial F80 feed size of 122 μm are carried out. From the experimental work, the optimal P80 grind size for flotation is identified as 54 μm with a recovery of 36.97% and a grade of 1.18%. Sustainable development could be achieved in a self-financing way by reprocessing tailings. For further research work on reprocessing the tailings from EMC LLC, this study work will be helpful to a certain extent, and more studies on operational and technological advancement are needed

DULAANJARGAL MENDBAYAR – МЭНДБАЯРЫН ДУЛААНЖАРГАЛ

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

HSE Advisor - ХАБЭА-н мэргэжилтэн

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

DAAD TNB scholarship, 2021 – 2021 онд Германы эрдмийн солилцооны албаны TNB тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Khanbogd Cashmere LLC - Ханбогд Кашмер ХХК
- Eco National LLC - Эко Нэйшнл ХХК

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Study on drought characteristics in Nalaikh and Terelj area using GIS with SPI and NDVI for 1990-2018 - 1990-2018 оны Налайх, Тэрэлж орчмын гангийн нөхцлийг зайнаас тандан судлалын SPI, NDVI мэдээнд үндэслэн судалсан нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

As the effects of climate change is continuing to pose large problems that affect ecosystems and communities around the world, arid and semi-arid places where there is a big imbalance between annual precipitation and evapotranspiration are exposed to more frequent and intense droughts due to temperature increases. Therefore, understanding different drought types concerning their severity, duration, and spatial extent is crucial to mitigate drought risks which can prevent huge environmental and economic losses. In this study, an analysis of long-term drought conditions in Nalaikh, Terelj region was done using the Standardized Precipitation Index (SPI) and Normalized Difference Vegetation Index (NDVI) between the years 1990 to 2018. Precipitation records of the study period were analyzed to define drought characteristics using the SPI and to identify drought events at 1-, 3-, 6-, 9- and 12-month timescales. The results showed that there were several moderate to extreme drought events from 1990 to 2018 with ranging durations. Significant drought events with SPI values higher than −2.0 were recognized at all time scales, although the frequency of each episode was decreasing as time scales increased. Moderate and severe drought events were observed the most at SPI 1- and 3-month timescales respectively with 54 and 21 events. Vegetation data from the Landsat 4,5 and 7 were collected and utilized to generate maps at a two-year interval from 1990 to 2018 using NDVI. Even though dry periods led to less vegetation, an indication of severe drought events could not be seen from the NDVI values as the value did not fall below −0.7 at SPI values with different intensities. The NDVI values were able to show variability and spatial distribution of drought events, excluding several years with weak correlation.

DULAMJARGAL ALTANKHUYAG – АЛТАНХУЯГИЙН ДУЛАМЖАРГАЛ

Graduated study program –Төгссөн мэргэжил

Mechanical engineering -
Механик инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Mechanic Concentrator Maintenance Department at Oyu Tolgoi LLC - Оюу Толгой ХХК-д Баяжуулах үйлдвэрийн засварын хэлтэст Механикч

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT Scholarship – 5 times, 2018-2021 - 2018-2021 онд МГТИС-ийн нэрэмжит тэтгэлэг 5 удаа
- 2019 Germany Summer School program – 2019 онд Германы явах Зуны сургалтын хөтөлбөрийн тэтгэлэг
- 2021 DAAD scholarship – 2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Hera Equipment LLC – Хера Экуйпмент ХХК

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Design of vehicle fuel flowmeter - Тээврийн хэрэгслийн шатахуун зарцуулалтыг хэмжих багаж загварчлах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

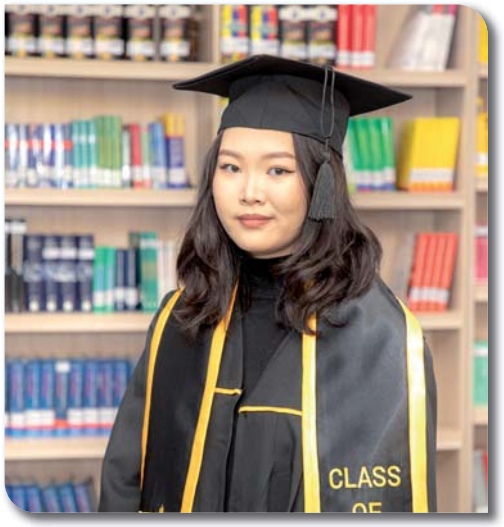
According to order No.390 of the Minister of Road and Transport Development of 2019, the vehicle fuel consumption is normed by its model in winter and summer usage. The organizations use this norm to calculate fuel costs for each vehicle. But differ from actual consumption, it creates many problems between economists and drivers of an organization. There is an urgent need for a device that measures exact fuel consumption not to create this kind of conflicts. It is important to design and use low-cost and reliable fuel consumption measuring devices that are suitable for Mongolian extreme conditions.
The design was proposed to be available for the fuel consumption of the Mitsubishi Fuso Rosa Bus of GMIT. The main component used in the fuel flow measurement device is a load cell which locates under the fuel tank with a volume of 110 liters to estimate its mass. The sensor directly transfers the data to the reporting system. Reporting application uses a digital screen to show measurement results including; millage, outside temperature, and consumed fuel amount. It would state in the vehicle cabin.
Зам, Тээврийн Хөгжлийн Яамны сайдын 2019 оны 390 дүгээр тушаалын дагуу автомашины шатахуун зарцуулалтыг өвөл, зуны хэрэглээнд тухайн тээврийн хэрэгслийн загвараар нь тогтоож өгсөн. Албан байгууллагууд уг нормд үндэслэн автомашин бүрийн шатахууны зардлыг тооцдог. Гэвч цаг агаар, замын нөхцөл байдал, жолоочийн ур чадвар, техникийн үзүүлэлт зэргээс хамааран шатахуун зарцуулалт бодит хэрэглээ заасан нормоос ялгаатай гардаг ба энэ нь тухайн байгууллагын эдийн засагч, жолооч хоорондын асуудал үүсгэдэг. Уг зөрчлийг гаргахгүйн тулд шатахуун зарцуулалтыг нарийн хэмжих төхөөрөмж хэрэгтэй байна. Монголын эрс тэс нөхцөлд тохирсон хямд өртөгтэй, найдвартай шатахуун зарцуулалтыг хэмжих төхөөрөмжийг зохион бүтээж ашиглах нь чухал.
GMIT-ийн Mitsubishi Fuso Rosa автобусны түлшний хэрэглээнд үндэслэн энэүү судалгааны ажил хийгдсэн болно. Түлшний зарцуулалтыг хэмжих төхөөрөмжид ашиглах гол бүрэлдэхүүн хэсэг нь 110 литр эзэлхүүнтэй түлшний савны доор байрлах ачааллын элемент бөгөөд түлшний савны бодит массыг тооцоолох зарчмаар ажиллана. Уг мэдрэгч нь тухайн хуагцааны өгөгдлийг систем рүү шууд дамжуулах ба тайлан мэдээлэх програм нь хэмжилтийн үр дүнг жолоочийн кабинд шууд харуулна. Дэлгэцэнд явсан зай, гаднах температур, зарцуулсан түлшний хэмжээ тооцоологдон харагдана.

Graduated study program –Төгссөн мэргэжил
Industrial engineering - Үйлдвэрлэлийн инженер
Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг
DAAD scholarship, 2021 – 2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Contribution of Key Performance Indicator (KPI) for achieving Sustainable Supply Chain Management: case study on beverage companies - Монголын аж үйлдвэр дэх “Тогтвортой нийлүүлэлтийн гинжин хэлхээний удирдлагын сисмем”-ийн төлөв байдал болон түүний боломжууд

ENKHJIN ENKHBAATAR – ЭНХБААТАРЫН ЭНХЖИН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Over the last few decades, one of the most pressing concerns facing the beverage sector has been sustainability. In fact, many producers have incorporated environmental, social, and economic aspects of sustainability into their manufacturing process at various levels. Aong with sustainability, the interest in supply chain (SC) dynamics has driven companies to invest in research and development (R&D), especially in tools to. measure, in particular making key performance indicators (KPI) more accurate and implementing a "sustainable" supply chain management (SSCM). Yet sustainability dimensions and goals q are often not linked to company and SC strategies. For which difficulties jn measuring sustainable practices and achieving sustainable supply chains with the appropriate set of key performance indicators (KPIs) are met. Hence, the aim of this study is as follows: (i) to conduct a literature review that identifies that state of sustainable practices in the carbonated soft drink industry and (ii) to reveal the application of the sustainable practices in the SC through an analytical hierarchy process (AHP) based on the interview with experts. The study revealed how sustainability was seen as a big concept and divided into different stages and stakeholders, the contribution of levels of KPIs to SC influenced them separately, which made the integration of the measurement complex.



Graduated study program –Төгссөн мэргэжил
Environmental engineering - Хүрээлэн буй орчны инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Temporal characteristics of air quality in Ulaanbaatar and its relationship with weather parameters - Улаанбаатар хотын агаарын чанарын цаг хугацааны шинж чанар, цаг агаарын үзүүлэлтээс хамаарах нь

ENKHJIN GANTULGA – ГАНТУЛГЫН ЭНХЖИН

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Over the previous few decades, Mongolia has faced a significant increase in population growth, urbanization, and industrialization, as well as a significant increase in mining and automobile use. As a result, the types and number of air pollution emission sources have increased significantly, particularly in cities. During the winter season, Ulaanbaatar, the capital of Mongolia, has the greatest amount of air pollution in the world. However, due to a lack of air quality control, the city's air quality is deteriorating. In this study, the temporal characteristics of air quality during the recent seven years, from January 2014 to December 2020, and its relationship with weather parameters were studied by assessing and processing the hourly data. The average concentrations of CO, NO_2, PM10, PM2.5, SO_2, and O_3 pollutants have illustrated different variations during the study period. The Air Quality Index is calculated by using the Air Quality Assessment and Regulation of Mongolia. The mean AQI clearly showed a decreasing trend from 2017 to 2020. Although air quality has steadily improved over the last four years, further steps must be taken in order to protect the health of inhabitants and future generations.

Graduated study program –Төгссөн мэргэжил
Mechanical engineering - Механик инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Study on further application of molybdenum disulfide extracted from Erdenet minings as a lubricant - Эрдэнэт үйлдвэрийн молбдений баяжмалыг тосолгооны материал болгон ашиглах боломжийн судалгаа

ENKHMAA ERDENEBAT – ЭРДЭНЭБАТЫН ЭНХМАА

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Purpose of the study is to investigate molybdenum disulfide extracted from the Erdenet Cu-Mo deposit as a solid lubricant and its further application.
This paper consists of a literature review of molybdenum disulfide's applications, physical and chemical properties, crystal structure and behavior under different conditions, and the lubricating mechanism. The scope of the research was molybdenum disulfide-free powder rather than other forms of molybdenum disulfide-based lubricants. Also, a lubricating condition in a regular atmosphere is considered rather than in a vacuum environment.
The main methods of the investigation are molybdenite concentrate analysis and observation of scanning electron micrographs of molybdenum disulfide particles. An experiment with a laboratory benchtop ring mill machine was done to observe the lubricating behavior.
As a result, molybdenum disulfide produced at the Erdenet Mining has the potential to be used as a solid lubricant even though the application of molybdenum disulfide as a free powder for lubrication is limited. Further purification and refining procedures are crucial to produce molybdenum disulfide with higher quality and to make it applicable for tribological tests. The powder with fine grade and better quality will be able to exported at a higher price

ENKHMANLAI KHUYAGBAATAR – ХУЯГБААТАРЫН ЭНХМАНЛАЙ

Graduated study program –Төгссөн мэргэжил

Mechanical engineering -
Механик инженер

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

DAAD scholarship, 2021 – 2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Barloworld Mongolia LLC - Барловорлд Монголиа ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. Basketball Championship of GMIT, 1st place, 2018 – 2018 онд МГТИС-ийн сагсан бөмбөгийн аварга шалгаруулах тэмцээний 1-р байр.
2. 3rd place of GMIT Symposium of Mongolia, 2017 - 2017 онд МГТИС-ийн оюутны бага хурал, 3-р байр

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Automation of coal briquette-fuel-fired stove for gers - Монгол гэрийн зуухны автоматжуулалт

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Over the past few decades, there has been a consistent growth in the use of stoves for heating in a traditional Mongolian house, so called Ger.

The main objective of this research is to implement automation of the existing stove in technical and environmental perspectives and to minimize human manual activities when they use the coal briquette fuel stove.

The new design of automation was made to the "Ulzii" stove produced by Turkey. Applying new design method on the existing stove the construction and operating costs were found lower than the original design.

All the drawings and three-dimensional virtual models of the components have been implemented using computer-aided design program so that the prototype of the new design can be manufactured

ENKHTUUL GANTUMUR – ГАНТӨМӨРИЙН ЭНХТУУЛ

Graduated study program –Төгссөн мэргэжил

Raw material and Process engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Process Engineer - Баяжуулалтын инженер

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship – МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD scholarship, 2021 – 2021 онд Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- The Central Laboratory of Geology - Геологийн Төв Лаборатори
- Soyolon International LLC - Соёолон ХХК
- GMIT-Processing Laboratory - МГТИС-Баяжуулалтын Лаборитори

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

Project competition organized by Erdenes Tavan Tolgoi LLC – Best 10 Projects - Эрдэнэс Таван Толгой ХХК-аас зохион байгуулсан төслийн тэмцээнд шилдэг төслөөр шалгарсан.

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Beneficiation and Flowsheet Development of a Tumurtei iron ore: A Case Study - Төмөртэйн төмрийн хүдрийн баяжуулалт ба Технологийн схемийг боловсруулах: Кейс судалгаа

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

This case study is performed to investigate the optimum process route to produce iron ore fine with the content of more than 62% Fe and dry concentrate with the content of more than 58% Fe from the iron ore from the Tumurtei mine, using "Wet low-intensity magnetic separation" and Dry Low-Intensity Magnetic separation, respectively.

The aim of this case study is to develop the flowsheet of the Tumurtei iron ore processing plant's wet processing and wash system by applying the wet and dry magnetic separation. The Fe content of the iron concentrate from the wash system is around 56%. However, the quality requirement for commercial iron ore concentrate is 62% in order to supply an upward treatment plant. Therefore, it is required to increase the Fe grade and reduce the impurities of the iron ore in order to make more value-added products at a higher price.

For this purpose, three samples coded "Feed", "Screen-1 OS" and "Screen-2 OS" were taken from 3 different processing stages of the wet processing and wash system at the Tumurtei iron ore mine.

The experiment consists of several parts: sample characterization including chemical and size distribution analysis, sample preparation, grinding time determination, and wet and dry magnetic separation process.

The chemical content of the samples was determined at the "Quality control department" of Tumurtei mine's laboratory of material. According to the chemical analysis result, the initial Fe content of the material was from 42% to 46%. As a result of the wet magnetic beneficiation, the iron content of the concentrate reaches 66%, which means the purpose of the experiment was accomplished on the target, and the impurities in the sample were reduced to a sufficient amount.

Moreover, the Fe content of the dry concentrates of "Screen-1 OS" and "Screen-2 OS" reached 54% and 58% respectively. It can be said that the dry magnetic separation experiment on "Screen-2 OS" was successfully completed. However, the Fe content of sample "Screen-1 OS" couldn't achieve the target because of its course size. Consequently, it is recommended to crush the ore until the top size becomes less than 3mm for the magnetic separation process.

KHATANSAIKHAN SAINBILEG – САЙНБИЛЭГИЙН ХАТАНСАЙХАН

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering -
Механик инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Oyu Tolgoi LLC – Оюу Толгой ХХК

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- Mongolian Government scholarship - МУ-н ЗГ-н тэтгэлэг
- DAAD - Sur Place scholarship - Германы эрдмийн солилцооны албаны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

"Burdel Mining" LLC - "Бүрдэл Майнинг" ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

GMIT Sports tournament - Volleyball
(2 Gold, 2 silver) -
МГТИС-ийн нэрэмжит Спортын тэмцээнд
Гарбөмбөгийн төрлөөр 2 алт, 2 мөнгөн медаль

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Preventive and Predictive Maintenance for Heavy duty Machinery - Хүнд машин механизмын урьдчилан сэргийлэх болон урьдчилан таамаглах засвар үйлчилгээ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

The primary objective of any business is to generate profit, since without profit the company would cease to exist. Therefore, the company's structure is designed to effectively produce and sell the goods produced. So the most essential thing in producing goods effectively is choosing the right maintenance strategy for a smooth operation. The mining equipment is built to survive the most extreme conditions, yet even the most powerful m mining equipment needs regular maintenance. Mining equipment that is not properly maintained and serviced on a regular basis will not work as expected and will also pose a risk to everything on the mining site including environment and people. Because various mining equipment is utilized on different mining sites, each mining site should have its own unique maintenance plan. So choosing the right maintenance strategy is essential in any plant or mining operation and this thesis addresses finding ways to choose the right strategy. This unique maintenance schedule will ensure that every piece of equipment will be properly maintained depending on the working environment, capacity and type of equipment. The company mentioned on this paper is an open pit gold mining company in Bulgan province. The data used in this research was collected from the Komatsu Dump truck section. Historical maintenance data of two different types of Komatsu dump trucks with different capacity were analyzed for the procedure.

KHONGORZUL DAVAAJAV – ДАВААЖАВЫН ХОНГОРЗУЛ

Graduated study program –Төгссөн мэргэжил

Industrial Engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Infrastructure engineer - Дэд бүтцийн инженер

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT excellent student scholarship - МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- DAAD scholarships - Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- MSM LLC - МСМ ХХК
- Erxes LLC - Эрхэс ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Founder of Lava volunteering club - Лава клубын үүсгэн байгуулагч
2. Host of Litmus motivational talk - Литмус ярилцлагын клубын чиглүүлэгч

Bachelor thesis topic – Бакалаврын дипломын сэдэв

The product optimizations for inadequate digital product management processes of digital startups in Mongolian market - Монголын зах зээл дэх дижитал старт-апуудын бүтээгдэхүүний менежментийн тохиромжгүй үйл явц дээрх оновчлол

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Keeping pace with the promptly changing technological evaluation with the sub concept of its digitalization has been developing rapidly in Mongolian startup market for the last few years.

The country is in 5th in east Asia regional ranking and in 67th worldwide on IT startups with only 3.4 million population [1]. Managing digital products is more non-identical than having traditional product management. Its core difference from non-digital products is their data availability and data evaluation. Hence, they need separate product management processes and stages on their digital product and most early-stage startups in Mongolian market are lacking to properly install it on their digital PM activities.

The paper consists of 5 sections including introduction, literature review, methodology, result and conclusion. In the literature review chapter, there will be the related definition and explanation of the key terms (digital product management, startup, technology driven product, agile, product lifecycle/steps etc.) and their characteristics in nature of the concept itself. The purpose of this literature review is to the significance of the product management of startups overall. It mostly consisted of looking at fundamentals in the topic area and existing PM related articles, researches and reports in order to start growing expertise. The materials gathered from associated books, websites, blogs, reports, and investigative journals. Moreover, the problems and the consequences that are explained in the introduction part, will be considered more deeply in view of its optimization of development in the methodology chapter. Open qualitative interview questions were sent out to product management specialists of Mongolian digital-startups in order to conduct the research and get familiar with the methodologies. This was done with the goal of acquiring real evidence from startups' product managers and linked managers' experiences as well as putting the research's theories and concepts. Afterwards, the viewpoints of the interviews and experiences, as well as the comprehensive theories and approaches of different product management dealing with problems and consequences discussed in the introduction, were analyzed in the result part. This was then used to successfully lead the conclusion part.

KHONGORZUL BAYARSAIKHAN – БАЯРСАЙХАНЫ ХОНГОРЗУЛ

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering -
Механик инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Supply and logistics specialist at MERA LLC -
МЕРА ХХК-д Тээвэр зууч болон хангамжийн мэргэжилтэн

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT scholarship 50% - twice - МГТИС-ийн нэрэмжит тэтгэлэг 50% - 2 удаа
- GMIT scholarship 100% - once - МГТИС-ийн нэрэмжит тэтгэлэг 100% - 1 удаа
- Scholarship from Drakhan-Uul province - Дархан-Уул аймгийн тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Burdel Mining LLC - "Бүрдэл Майнинг" ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. Granted 2nd place in National Students' Physics Olympiad as a team, 2019 – 2019 онд Физикийн оюутны улсын олимпиадад багаараа 2-р байр эзэлсэн
2. 1st place in Volleyball competition of GMIT, 2020 – 2020 онд МГТИС-ийн волейболын тэмцээний 1-р байр
3. 3rd place in Basketball competition of GMIT, 2020 – 2020 онд МГТИС-ийн сагсан бөмбөгийн тэмцээний 3-р байр
4. Champion of friendly competition between NMIT and GMIT, 2022 – 2022 онд Шинэ Монгол Дээд Сургууль болон МГТИС хоорондын нөхөрсөг тэмцээний аварга
5. 2nd place in Basketball competition of GMIT, 2022 – 2022 онд МГТИС-ийн сагсан бөмбөгийн тэмцээний 2-р байр

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Supply Chain Finance in Mongolia /case study/ - Монгол дахь нийлүүлэлтийн гинжин хэлхээний санхүүжилт

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

The transfer of financial resources in supply chains is becoming increasingly prominent. Creating an effective supply chain is critical in today's highly competitive and fast-changing corporate climate, where the organization of all resources is critical. Earlier supply chain research has concentrated on harmonizing product/services and information flows while ignoring financial consideration. As businesses sought to maintain liquidity and their competitive edge, demand for supply chain financing surged. Alternative financing, especially trade credit from suppliers, became more difficult to come by. An extension trade credit, on the other hand, is subject to bargaining strength, with weaker suppliers being obliged to extend the payment period or forcibly delay repayment. This can put the supply chain at risk or cause interruption. SMEs and enterprises benefit from SCF's working capital efficiency and cash conversion cycle. Long-term agreements and cross-selling products are also possible. The ultimate goal is to better align financial flows with product and information movements within the supply chain, resulting in better cash flow management.

KHUSLEN BATZORIGT – БАТЗОРИГТЫН ХҮСЛЭН

Graduated study program –Төгссөн мэргэжил

Industrial Engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Hankyong National University (Korean language program) – Хангүг Их Сургуульд Солонгос хэлний бэлтгэлд сурч байна.

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Achit Ikht LLC - Ачит-Ихт ХХК,
- Эрдэнэт Үйлдвэр ТӨҮГ - Erenet Mining Corporation

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. 3rd-time Golden Medal of Basketball competition of GMIT, 2017-2019 – 2017-2019 онд МГТИС-ийн сагсан бөмбөгийн тэмцээнд 3 удаа алтан медаль
2. Bronze medal of Basketball competition of GMIT, 2020, 2021 – 2020, 2021 онд МГТИС-ийн сагсан бөмбөгийн тэмцээнд хүрэл медаль
3. Golden medal of friendly competition between NMIT and GMIT, 2021 – 2022 онд Шинэ Монгол Дээд Сургууль болон МГТИС хоорондын нөхөрсөг тэмцээний алтан медаль
4. Golden medal and MVP of Volleyball competition of GMIT, 2020 – 2020 онд МГТИС-ийн волейболын тэмцээний алтан медаль болон Үнэ цэнэтэй тоглогч
5. Silver medal of Volleyball competition of GMIT, 2021 – 2021 онд МГТИС-ийн волейболын тэмцээний мөнгөн медаль

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Challenges, opportunities, and impacts on the MSMEs during COVID-19 pandemic in Erdenet Эрдэнэт хотын бичил болон ЖДҮ эрхлэгчдэд КОВИД-19 цар тахлын нөлөө, боломж болон асуудал

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

In Mongolia, there are 228’411 businesses entities registered with the government, 96’336 businesses are activated establishment, and 84’685 or 87.9% of them are microsized businesses in the 4th quarter of 2021. Also, 36’950 or 38.4% are operating in the sector of wholesale, retail, and trade, and 35’544 or 96.1% of them are micro-sized enterprises in the sector of wholesale, retail, and trade. In Erdenet, there are 5’339 businesses entities are registered, 1’911 businesses are active establishments, and 1’668 or 87.2% of them are micro-sized businesses. Also, 728 businesses are operating their businesses in the sector of wholesale and retail trade. To achieve the purposes, pre-prepared questionnaire was conducted with MSMEs in the wholesale, retail, and trade sectors. According to No5 article of the Mongolian Law on Support of Small and Medium-sized Enterprises and Services, MSME businesses and service providers are included in the business entities that meet the following conditions (1):

Table 1. Category of the MSMEs

	Category	Number of Employees	Annual sales revenue, MNT
1	Micro-business or service provider	1 – 10	Up to 300 million
2	Small business or service provider	10 – 50	300 million to 1 billion
3	Medium-sized or service provider	50 - 200	1 billion to 2.5 billion

During this thesis work, the mixed method of quantitative and qualitative survey was conducted and using the data from the Mongolian Statistical Information Service and Statistical Office of Orkhon province. The survey was conducted by micro, small and medium-sized enterprises, especially, in the wholesale and retail sector who are operating their businesses in Erdenet city, Mongolia. Covid-19 interruptions do not affect every business in the same way. Some are deemed necessary and remain open due to human requirements, while others, such as goods stores, restaurants, and other service-related enterprises, have been forced to close.

MUNKHBOLD BAYARCHULUUN – БАЯРЧУЛУУНЫ МӨНХБОЛД

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Oyu Tolgoi LLC - "Оюу Толгой" ХХК

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT excellent student scholarship, 2018, 2019 - 2018, 2019 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- DAAD Sur-Place Scholarship, 2019-2022 - 2019-2022 онд Германы эрдмийн солилцооны албаны Sur-Place тэтгэлэг
- Summer school scholarship in Freiberg – Фрайберг их сургуулийн Зуны сургалтын тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- Bayalag Eko LLC - "Баялаг Эко" ХХК
- Uuls Zaamar LLC - "Уулс Заамар" ХХК

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Impact of Dump and Heap leaching on the environment – Future trends in renaturation and reclamation measures
Овоолгон уусгалытын байгаль орчинд үзүүлэх нөлөө- Нөхөн сэргээлт, нөхөн сэргээлтийн арга хэмжээний цаашдын чиг хандлага

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Environmental quality standards may be violated around active and inactive leach dump or heap facilities by leachates discharges that can seep into the ground. This dissertation reviews the literatures of dump leaching and heap leaching which share many similarities with dump leaching procedures, with an emphasis on environmental monitoring, environmental impact assessment, and future closure actions.
The environmental impacts of the leaching process are generally modest with heap leaching because a geomembrane layer is provided in the base to prevent leakage. Dump leaching is more detrimental to the environment because there is often no base sealing system. The treatment of each leaching solution used for copper and gold leaching is investigated, as are rehabilitation and reclamation measures and treatment technologies.
Possibilities for dump or heap capping and utilizing it for rehabilitation have yielded promising results for implementation. New forthcoming techniques, like as vitrification, could be one alternative for sealing a dump base and covering the surface of a spent dump or heap. The possibility of calculating leakage flowrate from punctured geomembrane sheet and leaking from dump base with no geomembrane sheet using mathematical methods without any field inspection and measurement is investigated. As result, the leakage calculation equation of circular defects from a single-composite liner (geomembrane liner) was accessible for exploitation. For dumps with no geomembrane layer at bottom base, an equation based on liquid mass balance difference was created.

Graduated study program –Төгссөн мэргэжил
Mechanical engineering - Механик инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
The design of the representative sample taker machine in the existing grinding plant at the Technical University of Bergakademie Freiberg (TUBAF) - Фрайбергийн Техникийн Их Сургуулийн нунтаглах үйлдвэрт зориулж дээж авах машины загвар гаргах нь

MUNKHJARGAL SUMIYA – СУМЪЯАГИЙН МӨНХЖАРГАЛ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

The main goal of any mineral-related process is to extract the precious minerals from the ore cost-effectively and efficiently since these processes consume intense amounts of energy. Especially, milling circuits use a lot of energy than any other processes, so they are expensive to run. Thus, it is critical to optimize their operation to make them economically viable. These improvements can only be achieved by adopting new control strategies in existing milling plants. Same as other milling plants, the milling plant of "Institute for processing machines and recycling system technology" grind various ores and sieve them to perform certain tests. To have reliable test results, it is important to have correct and representative samples from the running circuit. But, the sampling method, which is used in the milling plant of TUBAF, is considered the wrong sampling method. As a result, it is hard to say that the samples can represent the whole running stream in the milling process. These ideas prompted the designing of the representative sample-taking machine from the running stream to have a reliable sample and control the process in the existing milling plant of TUBAF.

There are four different sampling points, which must be examined carefully to create the design of sampling machines. Because all the machines are already installed in the milling plants, it is impossible to move any machines and create the desired space for the sampling machines. Thus, each of the sampling machines has its different characteristics to fit into the milling plant's different points. In addition, in the design process, Pierre Gy's formulas and practical recommendations are used to create sampling machines' ideas that the samples have an equal probability of being selected. Based on the advantages and disadvantages of these ideas, the perfect ideas that can be implemented in the milling plant are chosen and constructed in SolidWorks, a computer-aided designing program.

MUNKHZORIG NYAMKHUU – НЯМХҮҮГИЙН МӨНХЗОРИГ

Graduated study program –Төгссөн мэргэжил

Environmental Engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

HSE Officer at Premium Concrete LLC - Премиум Конкрет ХХК-д ХАБЭАБО

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT Scholarship, 2018 – 2018 онд МГТИС-ийн нэрэмжит тэтгэлэг
- DAAD TNB Scholarship, 2021, 2022 - 2021, 2022 онд Германы эрдмийн солилцооны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Gatsuurt LLC - Гацуурт ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. Winner of speech contest of Global work camp in Japan 2018 - Япон дахь Global work camp 2018 илтгэлийн уралдааны ялагч
2. Worked on "Youth civic engagement project" 2019 - 2019 онд "Залуучуудын иргэний оролцоо төсөл" дээр ажилласан
3. Winner of German Unity Day 2021 contest in GMIT – МГТИС дээр болсон Германы тусгаар тогтнолын өдөр 2021 тэмцээний ялагч
4. Worked as a library assistant and barista at Coffee Corner at GMIT МГТИС-ийн номын сангын ажилтан болон Кофе корнерийн бариста
5. Worked as a host of the SPOTTED podcast - SPOTTED подкастын хөтлөгч

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Influence of pit latrines on private wells' water quality in the ger settlement area (Nalaikh district, Ulaanbaatar) - Гэр хорооллын гүний худгийн усны чанарт нүхэн жорлонгийн нөлөөлөл (Улаанбаатар хот Налайх дүүрэг)

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

This bachelor thesis focuses on the impacts of pit latrines on groundwater quality. Impacts of pit latrines on groundwater quality associated with microbiological and chemical contamination of groundwater are the main concerns. Apart from this, those contaminants could be transported by runoff to surface water because of the geographic condition of the land area of the 1st sub-district. Therefore, there is important to study for assessing the current situation.

Ger settlement area in Nalaikh district is not connected to the central water supply system. In that case, sanitation facilities and drinking water quality in ger area are important concerns. Most households in the ger area are using pit latrines for their sanitation besides there are some households and industries that have their own wells for drinking water. The main research area is 1st sub-district of the Nalaikh district where a number of households, organizations, and industries have more private wells than the other sub-district. Feces contamination from pit latrine could potentially leach into the ground and might be polluting soil through well water. In this study, water from three wells, including a private well, a flowing artesian well, and tap water from Khos-Uyanga secondary school, were collected from the 1st sub-district of Nalaikh district once a month between January and April. Moreover, a total of 14 soil samples were collected from the 1st sub-district ger settlement area. During this thesis work, the analysis of coliform bacteria in well water samples and heavy metal concentration in soil samples were conducted. The highest bacterial contamination was detected in the secondary school tap water, which was 200.5 MPN per 100ml of the total coliform concentration and 13.7 MPN per 100 ml of E. coli as well as Fecal coliform compared to MNS

4943:2015.

A total of 13 heavy metals concentrations were recorded and compared with the standard of MNS 5850:2008. The exceeded concentration of metals cobalt, copper, zinc, and arsenic was determined. However, at some sample points, the heavy metal concentration was found the limit detection by XRF. In order to more accurately determine soil contamination, calculations were made on the geo-accumulation index the contamination factor, and the pollution load index.

Overall, 5686 pit latrines were counted in Nalaikh district. From which 1141 pit latrines were counted in the 1st sub-district. The nearest pit latrines are located 30-110 meters away from flowing artesian well and Khos-Uyanga secondary school. Pit latrines and flush holes should be located as far away from gers and houses as possible, 15 meters from apartments and service areas, 20 meters from water kiosks, 150 to 250 meters from mines and drilled deep wells, and at least 200-250 meters from river banks, according to Mongolian technical requirements.

Besides, arsenic concentration of flowing artesian well and private well water samples, which was measured by Inductively coupled plasma-optical emission spectrometry (ICP), was 0.5 mg/l and 1.1 mg/l respectively. The permissible level of arsenic in drinking water is 0.01 mg / l, and the measured value in the water sample is much higher than this standard, indicating a high level of arsenic contamination.

In the future, it is necessary to create a database of deep wells in Nalaikh district, conduct regular water analysis monitoring and regular disinfection of pit latrines, and commence work to connect ger settlement area to the sanitation network.

In addition, there is an urgent need to take management measures to reduce soil pollution, such as restricting and banning the use of pit latrines in ger settlement areas, installing toilets that meet MNS 5924: 2015 standards.

NANDIN–ERDENE SARANBAATAR – САРАНБААТАРЫН НАНДИН–ЭРДЭНЭ

Graduated study program –Төгссөн мэргэжил

Environmental engineering -
Хүрээлэн буй орчны инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Pacific Training Group, Australia – Австрали улсын Номхон далайн сургалтын төвд суралцаж байна.

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

GMIT scholarship 25%, 2020, 2021 - 2020, 2021 онд МГТИС-н нэрэмжит 25% тэтгэлгийг 2 удаа

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Land Owner LLC - Ланд Овнер ХХК

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

2nd place, National Olympiad of "Fundamentals of Electrical Engineering 2021" – 2021 он Цахилгаан Техникийн Үндэс Улсын Оюутны Олимпиад 2-р байр

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

A gis-based methodology for green roof design in a densely built-up area in Ulaanbaatar, Mongolia - Гэр хорооллын гүний худгийн усны чанарт нүхэн жорлонгийн нөлөөлөл (Улаанбаатар хот Налайх дүүрэг)

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Ulaanbaatar has the highest population density in Mongolia. Consequently, for the past few decades, the massive movement of people to the city led to unplanned urbanization. Today, Ulaanbaatar is facing environmental problems in all seasons of the year. To resolve these issues, some measures have begun such as the "Green City Action Plan for the City of Ulaanbaatar", and "Green building guidelines", not to mention "A Billion Tree National Campaign". These massive projects have made a little to nothing difference in the fight against deforestation, climate change and desertification due to a lack of green space and funding. Thus, this work is to design green roofs on already existing buildings. The building footprint and potential rooftop areas for green roofs in 26th khoroo of Bayanzurkh district, Ulaanbaatar, Mongoliaare analyzed using GIS software and Google Maps. Out of residential 358 buildings, 40% or 0.784 km^2 of roof spaces are available for installing greenery in the study area. Considering the design criteria and local conditions, extensive green roofs are recommended. The selection of vegetation differs depending on building height due to the biomimicry of mountain landscape into buildings. The cost of installation is higher than traditional roofs but once the green roofs are installed, they would be simple and long-lasting urban ecosystem improver with proper care and maintenance.

NOMINTUYA BOLD – БОЛДЫН НОМИНТУЯА

Graduated study program –Төгссөн мэргэжил

Mechanical Engineering -
Механик инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Condition Monitoring Advisor at Barloworld Mongolia LLC -
Барловорлд Монголиа ХХК-д Техникийн Хяналтын Зөвлөх

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT excellent student scholarship, 2018,2019, 2021 -2018, 2019, 2021 онд МГТИС-ийн нэрэмжит "Шилдэг оюутан" тэтгэлэг
- DAAD scholarship, 2021-2022 - 2021-2022 онд Германы эрдмийн солилцооны албаны тэтгэлэг
- Leadership of tomorrow -100 scholarship from APU, 2021-2022 – 2021-2022 онд АПУ ХХК-ний "Маргаашийн манлайлал 100" тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

Burdel Mining LLC - "Бүрдэл Майнинг" ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

Basketball, Volleyball - 2nd and 3rd places - Гар бөмбөг болон Сагсан бөмбгийн тэмцээнд 2, 3-р байр

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Optimal Service Inspection and Maintenance for Highway Dump Truck - Автосамосвалын оновчтой техник үйлчилгээний мөчлөг болон засвар үйлчилгээ

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Periodic maintenance and optimal service inspection become important to prevent any failure of all mining machines. Among a lot of mining machines, I chose a highway dump truck. Highway dump trucks are large vehicles used in heavy cargo transportation. Due to the heavy loads carried by dump trucks, the maintenance of those vehicles should be performed periodically. Frequently the components of the engine and transmission fail along with damages. Therefore, periodic maintenance is important. The period of service inspection is scheduled for every 350 service hours in "Burdel Mining LLC". However, the standard service hours in which an inspection is needed is 250 hours. The selection of service hours should consider operating time, working environment, and service life of the machinery. It needs to be determined to guarantee not only the highest benefit with respect to the economy and lifetime of the dump truck but also the occupational health and safety related to the failure of the dump truck. Using the collected data in the field, the possibility of minimizing dump truck failure was studied in this research. Time-based maintenance, which has the same interval for all mining equipment, is not able to use due to mining environmental conditions and usage of the technique. Thus, condition-based maintenance is thought of as the most efficient method to do the service inspection based on the S.O.S analysis, fault codes, and service inspections. It increases the lifetime of heavy dump truck.

SENDER BAYANBAATAR – БАЯНБААТАРЫН СЭНДЭР

Graduated study program –Төгссөн мэргэжил

Industrial Engineering -
Үйлдвэрлэлийн инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Control engineer at Energy Resources LLC
- Энержи Ресурс ХХК-д Техник хяналтын инженер

**Scholarships during the study –
Суралцах хугацаанд авсан тэтгэлэг**

- GMIT 100% Scholarship – МГТИС-ийн нэрэмжит 100% тэтгэлэг
- DAAD scholarship, 2017-2018 - 2017-2018 онд Германы эрдмийн солилцооны албаны тэтгэлэг

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Baganuur LLC - Багануур ХХК

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

Use Scanner Data in the Consumer Price Index
- Зураасан кодыг хэрэглээний үнийн индексд ашиглах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Consumer Price Index measures the rate of changing price from period to period in households purchased basket of goods. It is a main indicator of macroeconomics which is responsible for controlling core inflation, setting interest rates, and calculating the minimum wage of the country. Therefore, even small accuracy of the CPI can affect those economic factors.

The study's main objective is to identify the challenges and opportunities to implement new data sources in Mongolian CPI based on Scanner Data of partnership retailers with ""SCOP Alliance LLC" in Mongolia. After considering historical data of the company, possible implementation of Scanner Data should be recommended on their CPI at the end of this paper. Also, to do calculation on price changes from March to April's yogurts on Ulaanbaatar's 16 retailer's partners of the "SCOP Alliance LLC" company using Tornqvist price index and Fischer price index and made analyses to identify how to change the categories of yogurts sold in different region. The price change index from March to April is around 1.05 that means price of yogurts of 16 retailers rose 5%. The result of analysis, the main categories of yogurts that purchased was "Amtlag"yogurt from SUU JSC, „Sain" yogurt from APU corporation, „Deej" yogurt from APU and „Goyo" yogurt from vitafit

TUGULDUR BAYARAA – БАЯРААГИЙН ТӨГӨЛДӨР

Graduated study program –Төгссөн мэргэжил

Raw material and Process engineering - Эрдэс баялаг боловсруулалтын инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Oyu Tolgoi LLC – Оюу Толгой ХХК

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT Excellent Student scholarship, 2018, 2021 – 2018, 2021 онд МГТИС-н Шилдэг оюутан тэтгэлэг
- DAAD scholarship 2018-2021 - 2018-2021 онд Германы Эрдмийн Солилцооны Албаны Тэтгэлэг
- Summer school in Germany, 2019 - 2019 он Германд Зуны сургалт
- DAAD Student Exchange scholarship, 2021 – 2021 Германы Эрдмийн Солилцооны Албаны Оюутан Солилцооны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Oyu Tolgoi LLC - Оюу Толгой ХХК
- Central Geological Laboratory - Геологийн Төв Лаборатори ТӨҮГ
- MERA LLC - МЕРА ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

1. Student Physics Olympiad prize-winner, 2019 - 2019 онд Оюутны Физикийн олимпиад шагналт байр -
2. Best Graduate in my Degree Program certificate 2022 - 2022 онд Шилдэг төгсөгч сертификат

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Planning, Monitoring, Closure, Renaturation, and Reclamation of Dump and Heap Leaching Operations under Special Consideration of Environmental Risks - Овоолгын болон нуруулдан уусгалтын технологийг хүрээлэн буй орчны эрсдлийг харгалзан төймлон судлах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Copper is a metal that has numerous applications in our surroundings and industrial sector due to its physical and chemical properties whereas potentially pertinent applications of gold are extended with forthcoming and outstanding nanotechnology where gold nanoparticles play role in biological sciences, chemical platforms, and materials science. Absence of high-grade deposits results in developing technologies which recover newly found or old stockpiled low grade, complex ores. Heap and dump leaching processes are designated for the low-grade ore since capital cost is relatively low than other percolation leaching processes.

In this thesis paper, concepts and current technologies of heap and dump leaching processes are studied within the outline of concept of the process, design of the construction, and the modern closure technologies with special consideration of environmental factors and risks. To set a baseline of the chemicals and pollutants, the relevant legal environment and standards were introduced in the literature review.

Percolation leaches mine operation and closure is the relatively new concept in Mongolia, in which the first tank leach processing plant has started the construction in 2002 and the commercial production in March 2004. Therefore, mine practices and cases of Mongolia and other foreign countries were selected based on the PESTLE analysis and investigated in advance to present the importance of closure management plan. Case studies are carefully chosen in prior of similar mine operation and closed mine accident. It was clarified from the studies that mine closure should be planned in advance of the operation, closure fund must be guaranteed, and the post closure risks have to be considered.

Graduated study program –Төгссөн мэргэжил
Mechanical engineering - Механик инженер
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Damage Simulation of Wind Turbine Tower and Effects on Modal Parameters - Салхин турбины эвдрэлийн симуляци бай модаль параметрт үзүүлэх нөлөө

TUVSHINTUGS MUNKHBAT – МӨНХБАТЫН ТҮВШИНТӨГС

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Renewable energy is valued worldwide, natural resources are finite and CO2 emissions are accelerating global warming. The wind energy farm is seen as a viable renewable energy source in Mongolia since the country's unique topography makes wind energy feasible. Mongolia has various wind energy farms, which follow the global trend. The wind turbine tower, which is typically slender, is regularly subjected to high wind loads and is vulnerable to a variety of hazards. Because the breakdown of a wind turbine tower causes the entire turbine to collapse, it is critical to identify any expected tower damages and their impacts on structural soundness in advance so that the structure's owner can take measurements to prevent additional damage. It is costly to do time scheduled maintenance all the time, and it will be too late when the structure fails. It is much more economically efficient to do condition-based maintenance, depending on the response of the modal parameters. Using these changes in wind turbine modal parameters, damage detection methods can be used to detect and estimate the severity of the damage inflicted upon the tower. Firstly, damage simulation was introduced to the structure by lowering the Young's modulus of targeted members of the structure. The effect of damage on modal parameters such as frequency and mode shapes of the tower was then investigated. Finally, frequency-based and mode shape-based damage detection methods were applied for damage localization. Both damage localization algorithms accurately detected the inflicted damage, but frequency-based damage detection method was only limited to finding one damage location. On the other hand, damage severity estimated by mode shape-based damage detection was consistantly lower than the simulated damage severity.

TUVSHINTULGA ERDENEBAATAR – ЭРДЭНЭБААТАРЫН ТҮВШИНТУЛГА

Graduated study program –Төгссөн мэргэжил

Industrial Engineer -
Үйлдвэрлэлийн инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

Controller Cost in Oyu Tolgoi Underground Project Controls Department - Оюу толгойн гүний төслийн хяналтын хэлтэст Зардлын хянагч

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

- FLSmidth Mongolia - ФЛСМИДТ Монголиа
- MSM Industrial - МСМ Индастриал
- CU Mongolia - Си Юү Монгол

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

1. GMIT Basketball МГТИС - Сагсан бөмбөгийн тэмцээн
2. Volleyball Competitions - МГТИС гар бөмбөгийн тэмцээн

**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

SCM improvements in Mongolia based on the example of the Pick Indicator System. A case study for improvement of the effectiveness of the order fulfillment output within the DC of a neighborhood store franchise in Mongolia - Pick үзүүлэлтийн системд суурилсан Монгол дахь нийлүүлэлтийн сүлжээг сайжруулах.

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ:

This bachelor thesis aims to study and describe how Central Express CVS LLC manages and operates its convenience store business mainly focusing on the distribution, DC order fulfillment, and warehouse management which supports the store chains' activities and further improvements in the supply chain is mentioned. Convenience store business is new to Mongolia and brands such as CU. Circle K, GS25 are competing to get the market share of the sector to themselves by improving their operation, service. size and more: Having products available in stores is the core of the business and the distribution of goods from the distribution center to store lacks efficiency and effectiveness due to the preparation of multi numbers of store replenishment orders- Qualitative method is applied to the research and data is collected from the interviews with parties that is involved with CU in Mongolia. Secondary data is retrieved from reports, publication sources, information system and internet. Data analysis is done by the literature chapter and based on the analysis, the conclusion is written.

URANBILEG ERDEMBILEG – ЭРДЭМБИЛЭГИЙН УРАНБИЛЭГ

Graduated study program –Төгссөн мэргэжил

Industrial Engineering - Үйлдвэрлэлийн инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

Aftermarket Commercial Solution Advisor at Barloworld Mongolia LLC - Барловорлд Монголиа ХХК-д Худалдан авалтын дараах асуудал хариуцсан мэргэжилтэн

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship- 100% - МГТИС-ийн нэрэмжит тэтгэлэг 3 удаа,
- 3 DAAD, TNB scholarship - Германы эрдмийн солилцооны албаны тэтгэлэг
- Scholarship for an Exchange Semester at TU Bergakademie Freiberg, Germany, 2021 – 2021 онд Фрайберг Их Сургуульд семестрийн солилцооны тэтгэлэг
- Erdenes Tavan Tolgoi JSC project scholarship – Эрдэнэс Таван Толгой ХХК-ийн төслийн тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

APU LLC - АПУ ХХК

Achievements during the study – Суралцах хугацаанд гаргасан амжилт

Best Graduate in my Degree Program certificate, 2022 - 2022 он Шилдэг төгсөгч сертификат

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Improving the Mongolian glass returning method based on the German experience - Шилэн лонх татан авч, дахин ашиглах механизмыг боловсронгуй болгох нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

Countries and companies worldwide strive to reuse their raw materials. At the same time, developed countries like Germany have achieved good results with glass bottle collection from the consumers. To learn from German experience, this paper provides a literature analysis of the development and success of German's glass bottle return rate. Mongolian situation analysis is done based on the APU JSC, which collects their shipped glass bottles of the products from market. APU's reverse vending machine implementation feasibility study is calculated using Net Present Value analysis and payback period method. In addition, using a comparison of glass bottle collection flow diagrams of Germany and Mongolia, and "WasteAware benchmark indicators", missing gaps and essential areas to improve in Ulaanbaatar are identified. With the help of German's experience and practices, suggestions are recommended to APU company.

USUKHBAYAR PUNTSAG – ПУНЦАГИЙН ӨСӨХБАЯР

Graduated study program –Төгссөн мэргэжил

Environmental Engineering - Хүрээлэн буй орчны инженер

Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

HSE at Premium Concrete - Премиум Конкрит ХХК-д ХАБЭАБО

Scholarships during the study – Суралцах хугацаанд авсан тэтгэлэг

- GMIT scholarship (50%) - МГТИС-ийн нэрэмжит тэтгэлэг 50%
- DAAD scholarship, 2020-2022 - 2020-2022 онд Германы эрдмийн солилцооны албаны тэтгэлэг

Professional internship place – Үйлдвэрлэлийн дадлага хийсэн компани

- Khanlab LLC - Хан Лаб ХХК
- BGM Distribution LLC – Би Жи Эм Дистрибюшн ХХК
- Millennium Challenge Account-Mongolia – Монгол дахь Мянганы сорилтын сан

Bachelor thesis topic – Бакалаврын дипломын сэдэв

Determination of deoxygenation rate of Selbe River and its purification study - Сэлбэ голын өөрийгөө цэвэршүүлэх горимыг хүчилтөрөгчийн ханамжийн хэмжээг тодорхойлох замаар судлах нь

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

The Selbe river is one of the major tributaries of Tuul river, which flows through Ulaanbaatar city. The total length of Selbe river is 36.6 km and it is located in Tuul river Basin, where around 46% of the Mongolian population is concentrated. However, in recent years Selbe River has lost its original state and appearance due to unplanned and unregulated urbanization near the river area.

The purification system of the Selbe river, the Streeter-Phelps model, is used to describe the self-purification distance, critical oxygen deficiency and critical time of the Selbe river. Therefore, the deoxygenation rate k1 and the reaeration rate k2 constant are determined during the thesis study.

The mean deoxygenation rate constant k1 is calculated using two models, namely the Thomas slope and first-order function methods. The results showed that the first order function model is more suitable for describing the deoxygenation rate k1, which is 0.1070 and 0.2465 correspondingly in 10 and natural logarithmic base, because of sampling standard deviation are 0.0236, 0.0543 respectively in natural and 10 logarithmic bases of statistical analysis.

The mean reaeration rate constant k2 is estimated using 22 different models for the reaeration rate calculation. Jha (2001) model results are valid, because it had lowest sampling standard deviation of 1.009 compared with other models. Accordingly, the mean reaeration rate k2 in Selbe river is 3.91.

As a result, using the hydrological measurements, deoxygenation rate k1 and reaeration rate constant k2, the critical oxygen deficiency distance in Selbe river is calculated 4.14 km with critical oxygen deficit 2.43 mg/L and 0.25 days of critical time applying Streeter Phelps oxygen sag model.

ZANABAZAR ALTANGEREL – АЛТАНГЭРЭЛИЙН ЗАНАБАЗАР

Graduated study program –Төгссөн мэргэжил

Industrial Engineering -
Үйлдвэрлэлийн инженер

**Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль**

New Product Introduction Coordinator at Barloworld Mongolia LLC - Барловорлд Монголиа ХХК-д Шинэ бүтээгдэхүүн хариуцсан мэргэжилтэн

**Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани**

Ert Shonkhor drilling company - Эрт Шонхор өрөмдлөгийн компани

**Achievements during the study –
Суралцах хугацаанд гаргасан амжилт**

Sport Festival: Volleyball (gold-2, silver-2) basketball (silver-2, bronze-1 - МГТИС-ийн нэрэмжит сагсан бөмбгийн тэмцээнд 2 мөнгө, 1 хүрэл медаль, гар бөмбгийн тэмцээнд 2 алт, 2 мөнгөн медаль

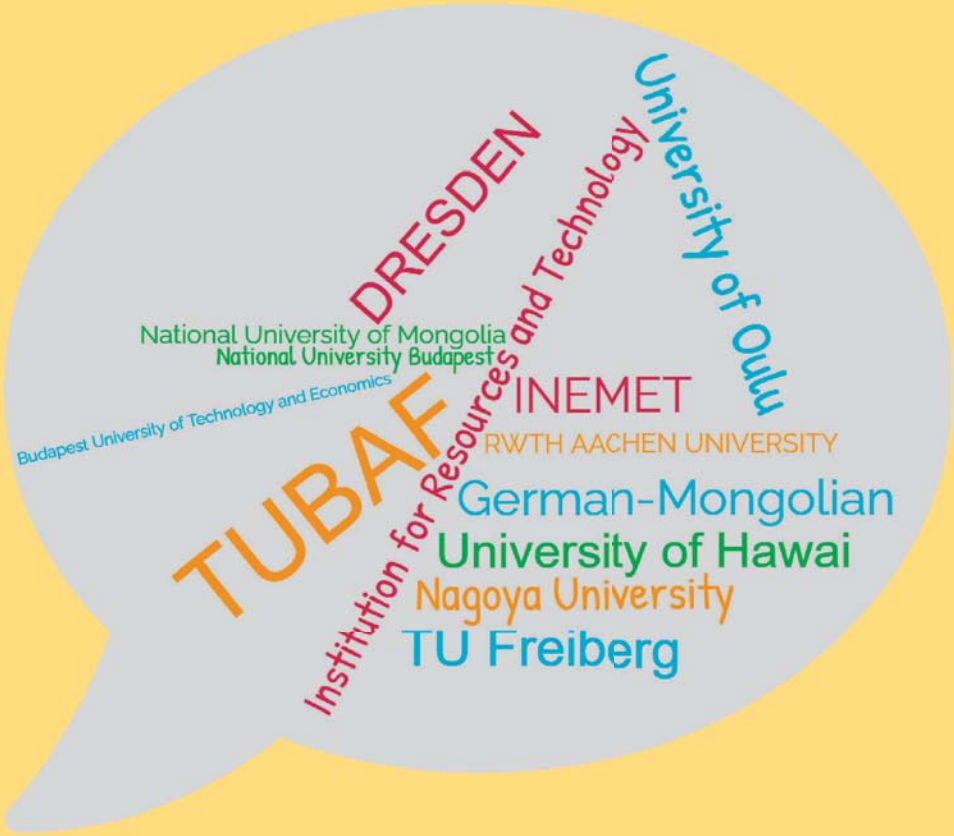
**Bachelor thesis topic –
Бакалаврын дипломын сэдэв**

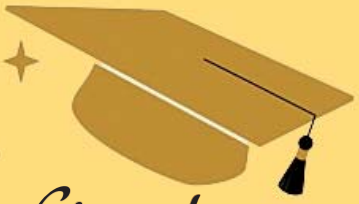
Reusing and collecting used glass bottles in Mongolia - Шилэн савалгааг дахин ашиглах зарим орны туршлага, түүнийг Монголд хэрэгжүүлэхэд тулгарч буй эцсийн хэрэглэгчдийн хандлага.

ABSTRACT OF BACHELOR THESIS – БАКАЛАВРЫН АЖЛЫН ХУРААНГУЙ

In 2018, The capital Ulaanbaatar of Mongolia generated 1.4 M t/a waste and from that 319'000 ton is glass waste. Glass bottles take 4000 to 1 million years to decompose in the environment. Glass bottles can be reused approximately 25 to 50 times depending on its quality. Imports 118 million glass made products and it costs approximately 33 million dollars. Furthermore, 30 million dollars of glass bottles are imported and thrown away like a paper cup. If glass is produced by using recycled glass, it reduces related water pollution 50% and air pollution by 20%. Mongolia has a demand for glass bottles using usage since Mongolian beverage companies exist. Mongolia rapidly needs a system of glass bottles reuse and collect them from consumers

Universities for graduate studies –
Магистрын хөтөлбөрт хамрагдаж буй их сургуулиуд

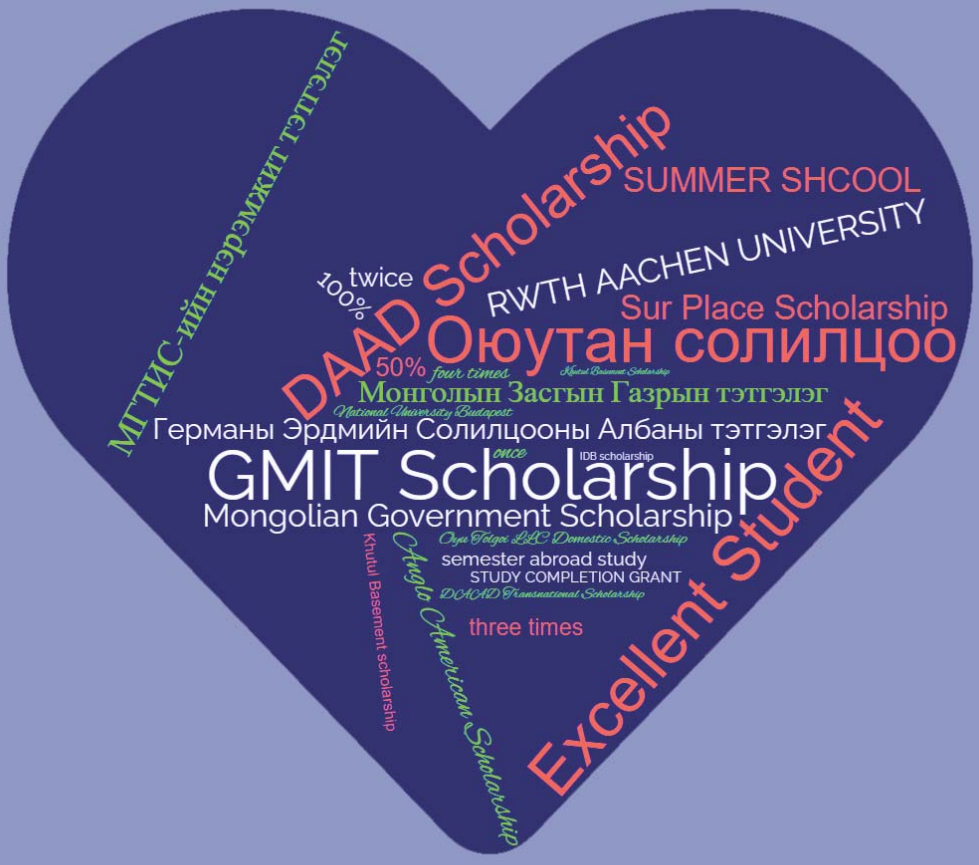


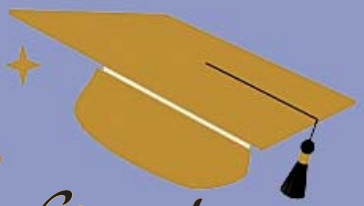


The Future We Create: Class of 2023

Ирээдүйг бид бүтээнэ

Universities for graduate studies –
Магистрын хөтөлбөрт хамрагдаж буй их сургуулиуд





The Future We Create: Class of 2022

Ирээдүй бид бүтээнэ

Graduated study program –Төгссөн мэргэжил
International Management of Resources and Environment Байгалийн нөөц, хүрээлэн буй орчны олон улсын менежмент
Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
Capital City Housing Policy Agency Нийслэлийн орон сууцны бодлогын газар
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Redevelopment of Ulaanbaatar Ger area Улаанбаатар хотын гэр хорооллын дахин төлөвлөлт

NOMIN GANBAATAR –
ГАНБААТАРЫН НОМИН

ABSTRACT OF BACHELOR THESIS:

Ulaanbaatar's ger areas are undergoing replanning and redevelopment, but due to compliance with procedures, laws and regulations, lack of funding, and the availability of engineering infrastructure and its capacity, the scope of ger areas has been expanding, air and environmental pollution has increased, and the rights of citizens protected by law to live healthy and in a safe environment continue to be seriously violated, and has reached this point while mitigating solutions are being sought out. Due to insufficient funding, the government wants to partner with the private sector to re-plan and redevelop the ger areas, but the cost of construction of infrastructure adding to the costs is high and there is a price deficit, so the private sector has limited financial and economic opportunities to recover the expenditure.

The private sector can carry out the construction of the infrastructure works in the PPP design-build-finance-operate-transfer type, but the cost of engineering infrastructure work is high, there are tariff due to losses in heating transmission, there is a long repayment period and they have insufficient financing sources. In case of partnering with a housing construction company, the cost of the external engineering infrastructure work causes the cost per square meter of the building to increase and the housing to be sold at a higher price than the market price of affordable housing. In such a situation, the legal entity implementing the project is interested in carrying out external engineering infrastructure works on a build-to-transfer basis in order to implement the proper management of its capital.

As a result of the financial and economic analysis, if the government solves the problem by investing in infrastructure, the government, the private sector and the beneficiaries can all benefit from the project of re-planning and redeveloping of the ger area. If the external engineering infrastructure is solved with state funds, the following type of PPP model can be successfully implemented. Such as:

1. The project implementers will acquire land from the government for the construction of high-quality and affordable housing and conduct replanning and redevelopment of the ger areas.
2. The government will give land to project implementers in the form of land subsidies, thus conducting re-planing and redevelopment of ger areas
3. Re-planning and redevelopment of privately-owned land is financially beneficial to the government, private sector, and beneficiaries.

SHINETSETSEG LKHAGVASUREN – ЛХАГВАСҮРЭНГИЙН ШИНЭЦЭЦЭГ

Graduated study program –Төгссөн мэргэжил

International Management of Resources and Environment
Байгалийн нөөц, хүрээлэн буй орчны олон улсын менежмент

Scholarships during the study
Суралцах хугацаанд авсан тэтгэлэг

Scholarship for a Semester at TU Freiberg, Germany
Fall Semester 2020
ХБНГУ-ын Фрэйберг их сургуулийн 2020 оны намрын семестрийн тэтгэлэг

Current affiliation or study –
Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль

CEO of Smart Lab LLC
Смарт Лаб ХХК-ийн гүйцэтгэх захирал

Professional internship place –
Үйлдвэрлэлийн дадлага хийсэн компани

Hydrogeological - Environmental geological research project Of Ulaanbaatar area by Ministry of Mining and Heavy industry
УУХҮЯамны захиалга Улаанбаатар хотын геоэкологи- Гидрогеологийн сэдэвчилсэн судалгааны төсөл

Bachelor thesis topic –
Бакалаврын дипломын сэдэв

Assessment of soil heavy metal distribution in Nalaikh district, Ulaanbaatar, Mongolia
Улаанбаатар хотын Налайх дүүргийн хөрсний хүнд металлын тархалтын үнэлгээ, судалгаа

ABSTRACT OF BACHELOR THESIS:

Soil ecosystem services, like all ecosystem services, are critical for meeting societal needs like food and energy provision, as well as overcoming societal challenges like climate change mitigation and adaptation. Large amounts of harmful pollutants are being discharged into the environment as a result of increased industrialization around the world. Mining, a complex industry, has a wide range of environmental consequences that affect nearly every element of life on Earth. Mining operations are regarded as a major source of metals that can be discharged into the environment, polluting rivers and accumulating in high concentrations in soils and sediments.

Soil aims to increase understanding of the significance of soil functions and related ecological processes, according to the investigation of Geo-environmental Mapping and Assessment. Therefore, heavy metals in soils are most interested do to a research on geo-environmental side of soil and related parameters.

The thesis investigation has based compartment between recent and previous similar investigation reports and chemical analysis of soil around UB Nalaikh area.

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Current affiliation or study – Одоогийн эрхэлж буй ажил эсвэл сурч буй сургууль
GMIT- Associate to graduate studies МГТИС – Ахисан түвшний сургалт хариуцсан мэргэжилтэн
Bachelor thesis topic – Бакалаврын дипломын сэдэв
Introduction of ISO 21001:2018-EOMS to Mongolian universities and colleges: opportunities and challenges ISO 21001:2018- Боловсролын байгууллагын мененжментийн тогтолцоог Монголын их дээд сургууль, коллежид нэвтрүүлэх нь: Давуу тал, боломж болон хүндрэл бэрхшээл.

URANGOO TURBAT –
ТӨРБАТЫН УРАНГОО

ABSTRACT OF BACHELOR THESIS:

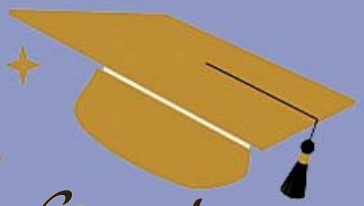
The ISO 21001:2018 – Educational organizations – Management systems for educational organizations, seeks to provide help to hundreds of millions of learners all over the world, and with millions of educational organizations to evaluate the degree to which they meet the requirements of learners and other stakeholders, and to improve their ability to do so [1]. The ISO 21001 standard follows the high-level structure, where clauses 4 to 10 (Context of the organization, Leadership, Planning, Support, Operation, Performance evaluation, and Improvement) present the requirements for a management system for EOMS [2].

For the Mongolian educational sector, specifically for higher educational organizations: universities and colleges, the ISO 21001:2018-EOMS is brand new approach for a successful Quality management. Initially, ISO 21001:2018-EOMS was introduced in 2019, later on, in October 2021 it was translated and officially issued as MNS ISO 21001:2021.

In Mongolia, some universities and colleges like the Internal Affairs University of Mongolia and the Mandakh Institute, private university, have already obtained the ISO 21001:2018-EOMS certificate, but the largest state universities such as the Mongolian University of Science and Technology (MUST) and the National University of Mongolia (NUM) are still in preparation.

The first transnational university in Mongolia, the German-Mongolian Institute for Resources and Technology (GMIT) – founded in 2013 to transfer the German engineering know-how to Mongolia – is committed to obtain the new ISO standard for Quality Management in educational organizations as well. Additionally, private colleges like the New Mongol Institute of Technology (NMIT) showed interest in the new ISO standard as well. The awareness of the importance of Quality Management in Higher Education Institutes (HEI) is driven by the Mongolian National Council for Education Accreditation (MNCEA) and is supported by the Mongolian Ministry of Education and Science (MEDS).

According to the International Organization of Standardization (ISO) - founded in 1947, headquarters in Geneva, Switzerland - the implementation of ISO 21001:2018 will contribute to internal organization improvement; communication; higher employee motivation; higher productivity; and less complaints from students and staff, also contribute to financial performance improvement, and the attraction of the university in the awareness of potential students.



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