



M M H

# TEAM 6

**REMOTE SENSING APPLICATION FOR  
MINERAL EXPLORATION**

FINAL PRESENTATION  
CS&IE, 111110544 LIHEWEI 111110543 TUMEINI

2025.05.28

.....

# TABLE OF CONTENTS

01

Project shift over  
time

03

MMH reborn,  
Mongolian Mining Hub

02

Remote sensing in  
practical

04

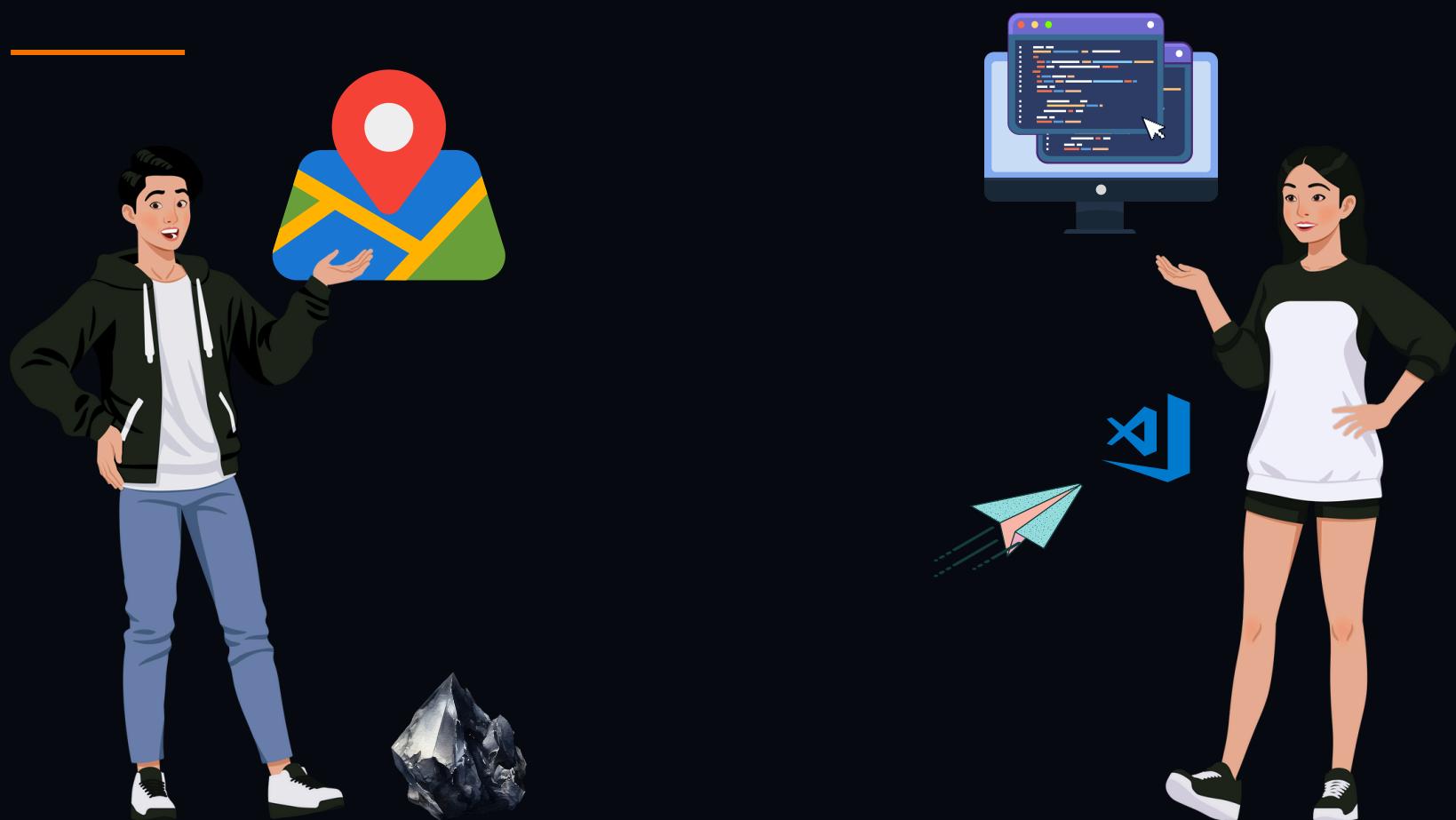
Gantt chart,  
Summary

.....

Our content today is  
divided into four parts.  
Each part will be described  
with examples.

# ABOUT US

WE ARE TEAM 6.  
TWO MONGOLIAN STUDENTS TEAM WHO  
ARE WORKING ON MAPS AND CODES.



```
File.expand_path("../..").join('mongoid').buffer
#ent database truncation if the environment is test or development
"The Rails environment is running in production mode.
're spec_helper'
're rspec/rails'

ire 'capybara/rspec'
uire 'capybara/rails'

capybara.javascript_driver = with
category.delete_all; Category.create(
shoulda:Matchers.configure do |config|
config.integrate do |with|
with.test_framework :rspec
with.library :rails
end
end

# Add additional requires below this line if you need them

# Requires supporting files (e.g., helpers and根基)
# run as spec files by default. You can change this using
# in _spec.rb will both be required. The syntax is:
# run twice. It is recommended that you do not name
# end with _spec.rb. You can configure this with the
# option on the command line -c or in config/environments/
# mongoid
# buffer
```

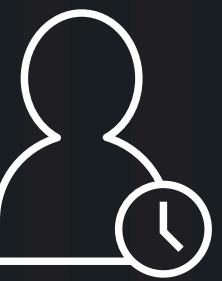
# TIMELINE

our project progress over time.

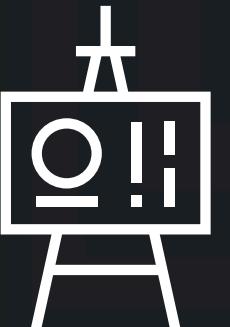
---

Pre-production stage  
plays an important  
role in concept and  
project direction

---



First Midterm



First Final term

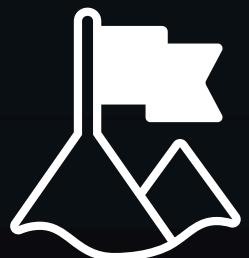
---

Project should end with results.

Good project continue even after the projected timeline. And benefit others and progress to the last end.



Second Midterm



Final Final term (Today)

# FIRST MIDTERM

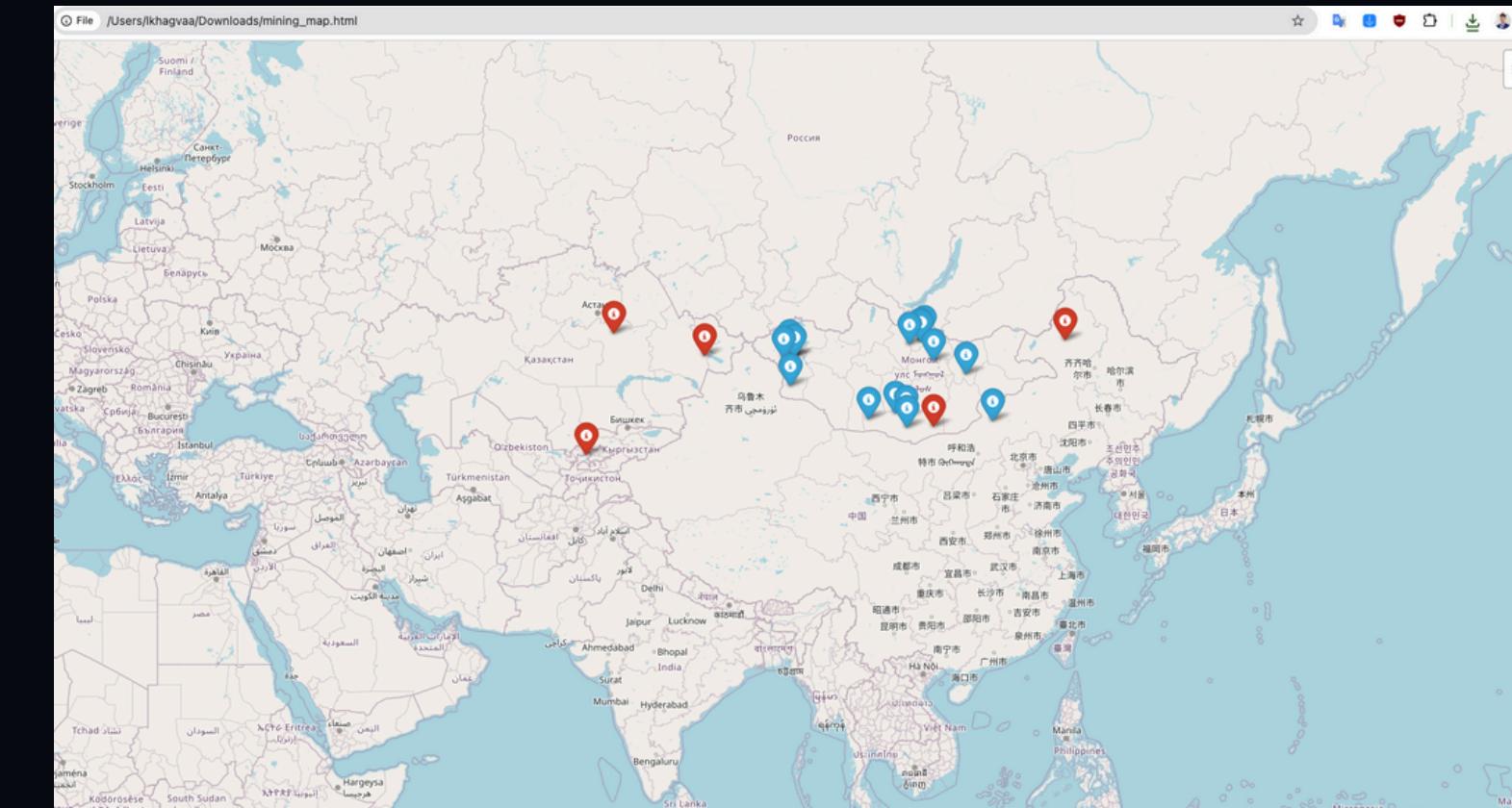
---



Link

[First tool in  
Google Colab](#)

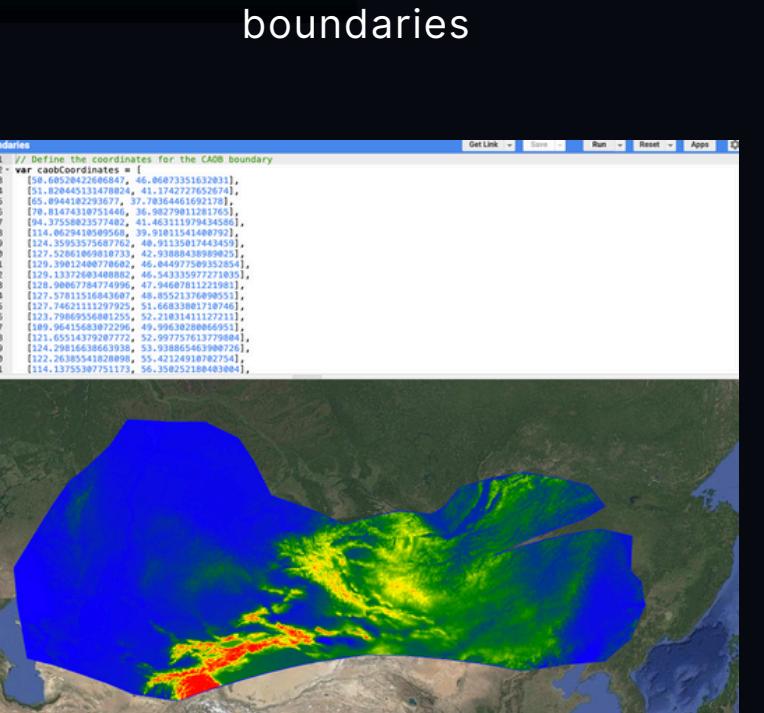
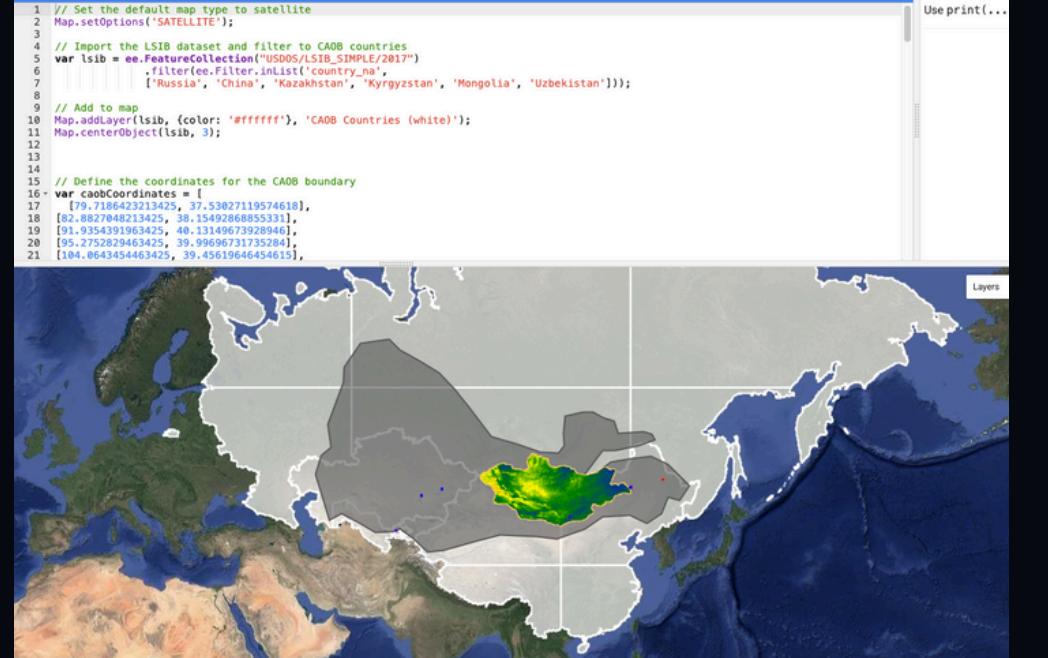
In the midterm, we introduced our project's focus on Mongolia's geology and mineral resources, emphasizing remote sensing as a tool for exploration. We discussed key techniques and case studies, laying the groundwork for future GIS and machine learning applications.



2024 OCTOBER

# GOOGLE EARTH ENGINE START

boundary with countries with deposits locations



## Literature Review Summary

The literature review explored Mongolia's rich geology within the Central Asian Orogenic Belt and its abundant mineral resources like copper, gold, and rare earth elements. It emphasized the use of remote sensing technologies—such as satellite imagery and spectral analysis—for efficient mineral exploration. Case studies showed successful applications, and the review highlighted future prospects like GIS integration and machine learning.

THE FIRST  
**FINAL**

2024 DECEMBER

# FOCUS OF FINAL

FOCUSED  
ON MAIN  
SITE

FOCUSED ON  
REMOTE  
SENSING  
TOOL

CONTINUES  
IN  
MONGOLIA

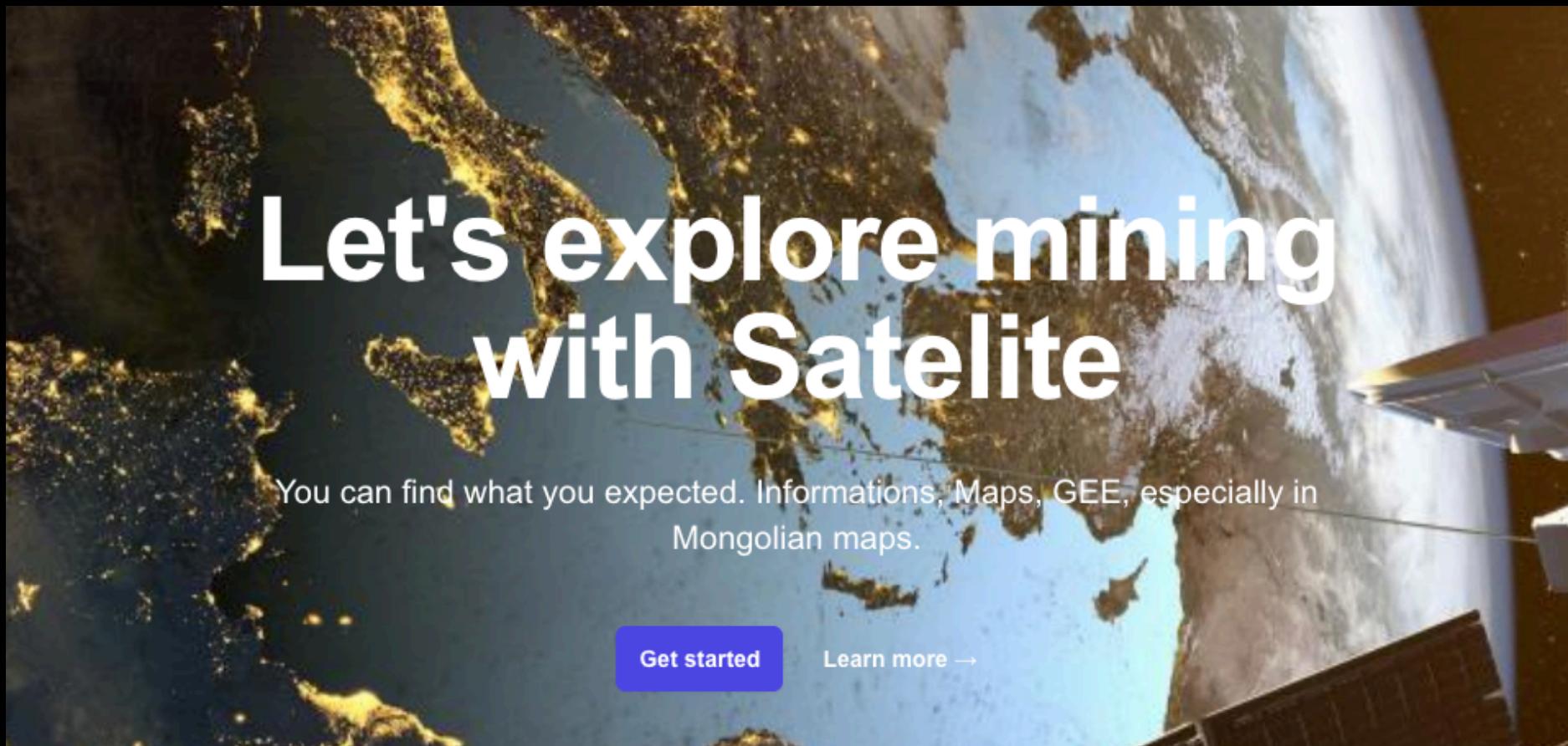
USER INTERFACE  
BEGINNING

STARTING WITH MTMF  
AND SAM.  
TESTING WITH ORDINARY  
MINERAL CLASSIFICATION

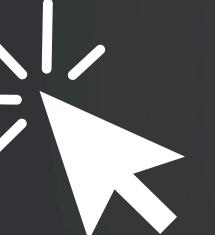
INTERNSHIP

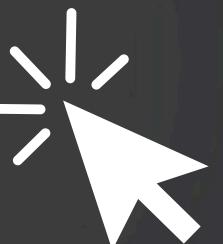
# PRE-PRODUCTION PUBLISHMENT

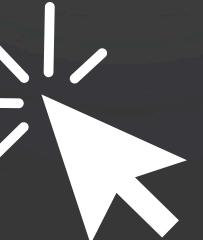
LINK



IMPROVEMENT  
EVERY TIME

MTMF 

SAM 

NORMAL 

## SECOND MIDTERM

Start of machine learning  
data collection

# ABOUT

---

MAIN WEBSITE  
IMPROVEMENT WITH  
NEXTAUTH

We started enhancing our project by integrating machine learning models for mineral deposit prediction and added secure login with NextAuth. The workflow included data collection, feature engineering, model training (e.g., Random Forest), and visualization using GIS tools. These advancements improved accuracy, reduced costs, and streamlined mineral exploration.

---

# THEORETICAL APPLICATION OF MACHINE LEARNING IN MINERAL EXPLORATION

---

Pattern Recognition

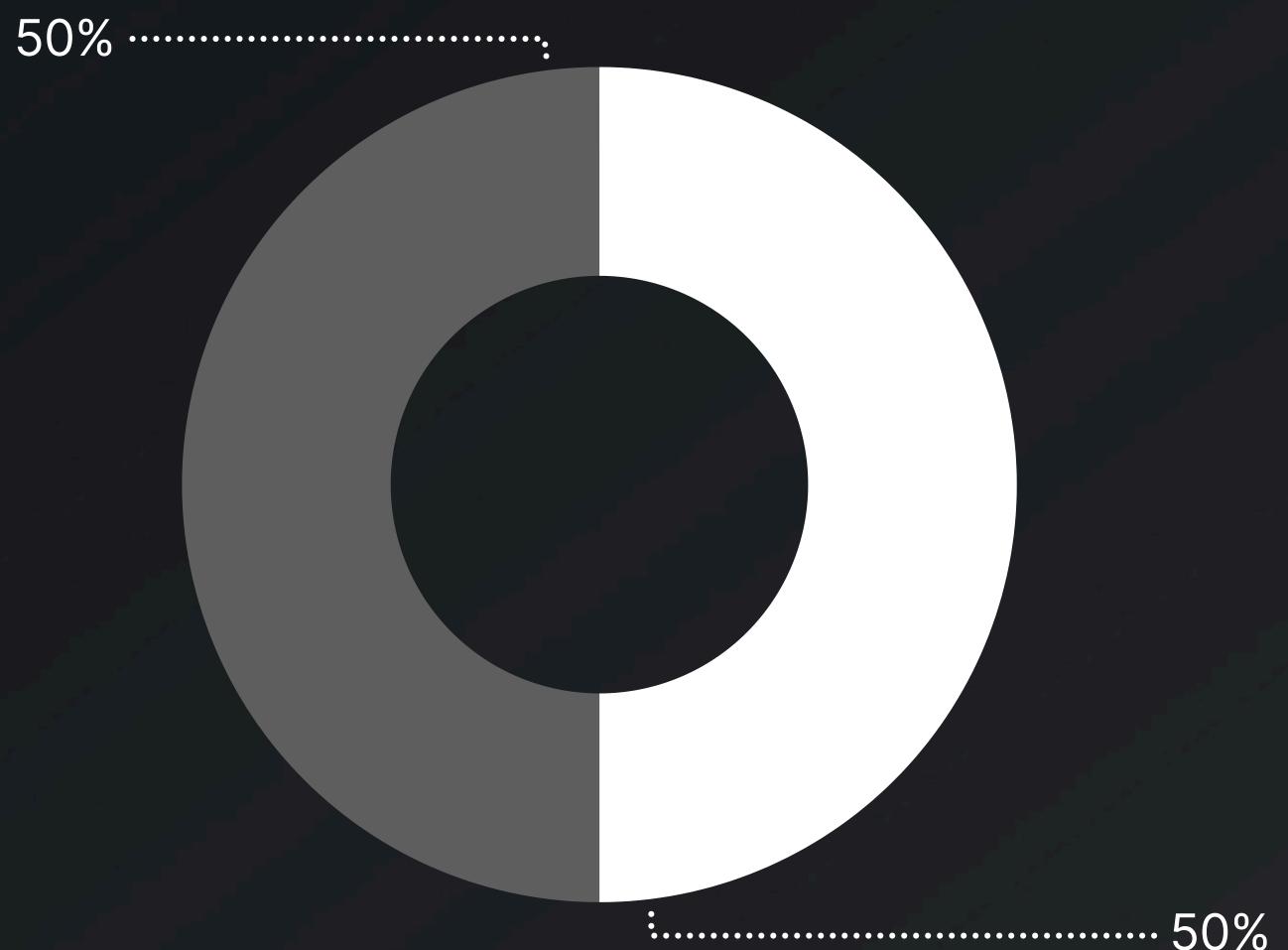
Feature-Target  
Relationships

Generalization

Reduction of Human  
Bias

Continuous Learning

Can it be applied in practical



# EXPECTATION

---

We had this kind of expectation at first.

---

How ml data traing will work



# FACTORS

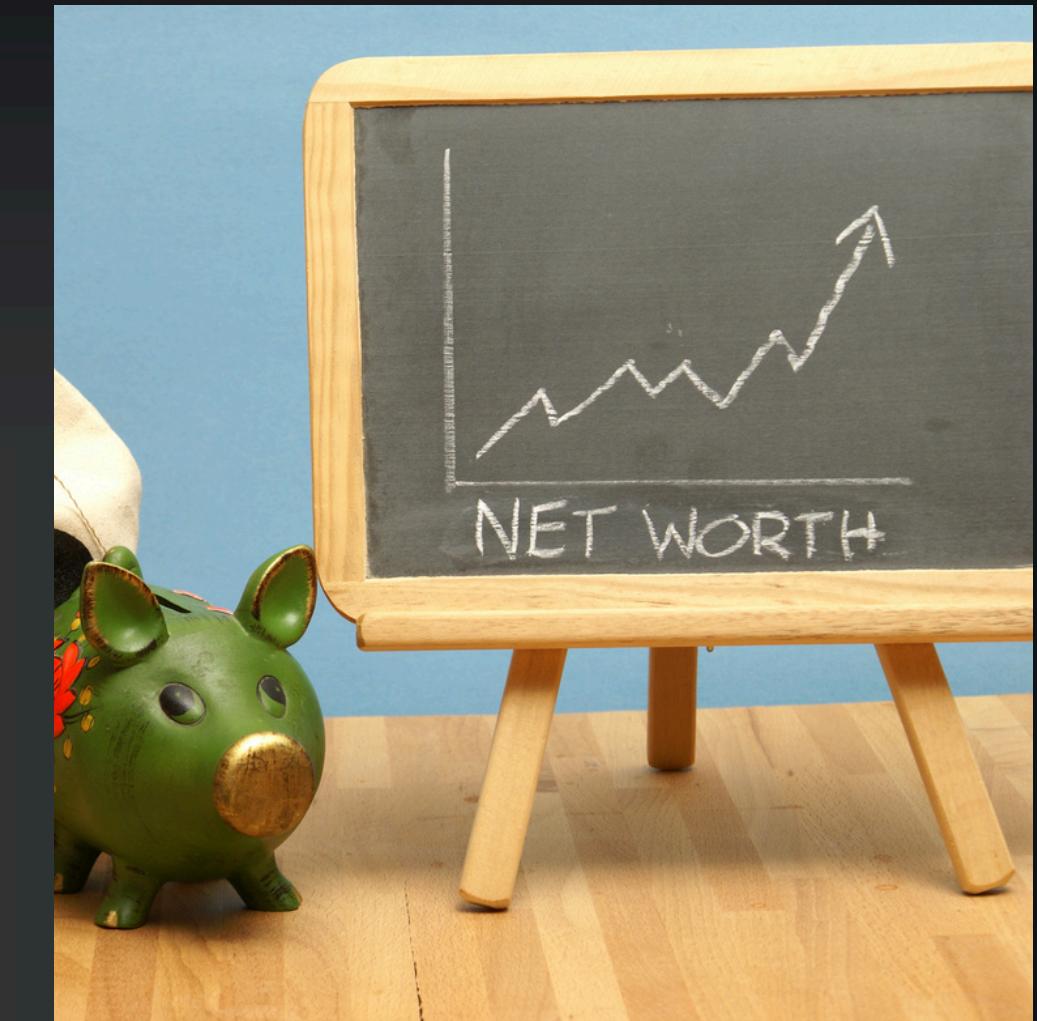


Data

Non public

Network

People in the field



Networth

Funds are lacking

# TESTING TIME

Currently in pre-production.  
Not yet finished



# REMOTE SENSING IN PRACTICAL

---

Alternatives and products  
in field

FLEET SPACE  
TECHNOLOGIES –  
EXOSPHERE  
PLATFORM

KOBOLD METALS –  
AI-DRIVEN MINERAL  
EXPLORATION

ESRI ARCGIS –  
HYPERSPECTRAL  
MINERAL MAPPING

TERRAEYE

1

Uses nanosatellites and AI-driven tomography to map underground geology up to 2.5 km deep, accelerating mineral discovery timelines.

2

Applies AI and big data to locate critical mineral deposits like copper and lithium, improving exploration efficiency and accuracy.

3

Enables hyperspectral analysis of satellite imagery to detect mineral signatures, even in complex or vegetated terrains.

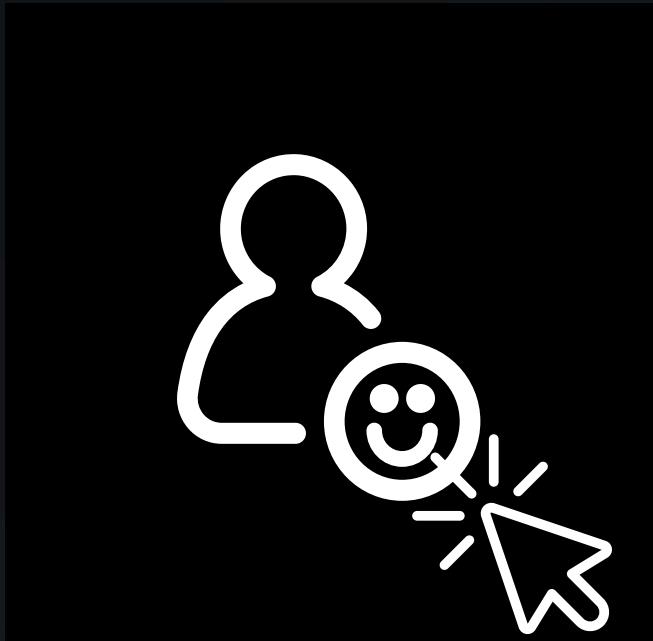
4

TerraEye is an AI-powered, cloud-based platform designed to enhance mineral exploration through advanced satellite data processing and remote sensing technologies.



## Next Phase: Transition to the Mongolian Mining Hub (MMH)

### Centralization



### What is Changing?

**From a tool to a hub:** We're evolving from a focused exploration tool into a multi-functional platform.

**From data to insight:** Instead of just providing maps and models, MMH will also share live stock data, mining news, and educational content.

**From one audience to many:** MMH will serve not only geologists but also investors, students, educators, and policymakers.

"

As we move forward, our project is evolving into a more ambitious and inclusive platform: Mongolian Mining Hub (MMH). This new phase aims to become a centralized portal for anyone interested in Mongolia's mining sector—from researchers and investors to students and professionals.

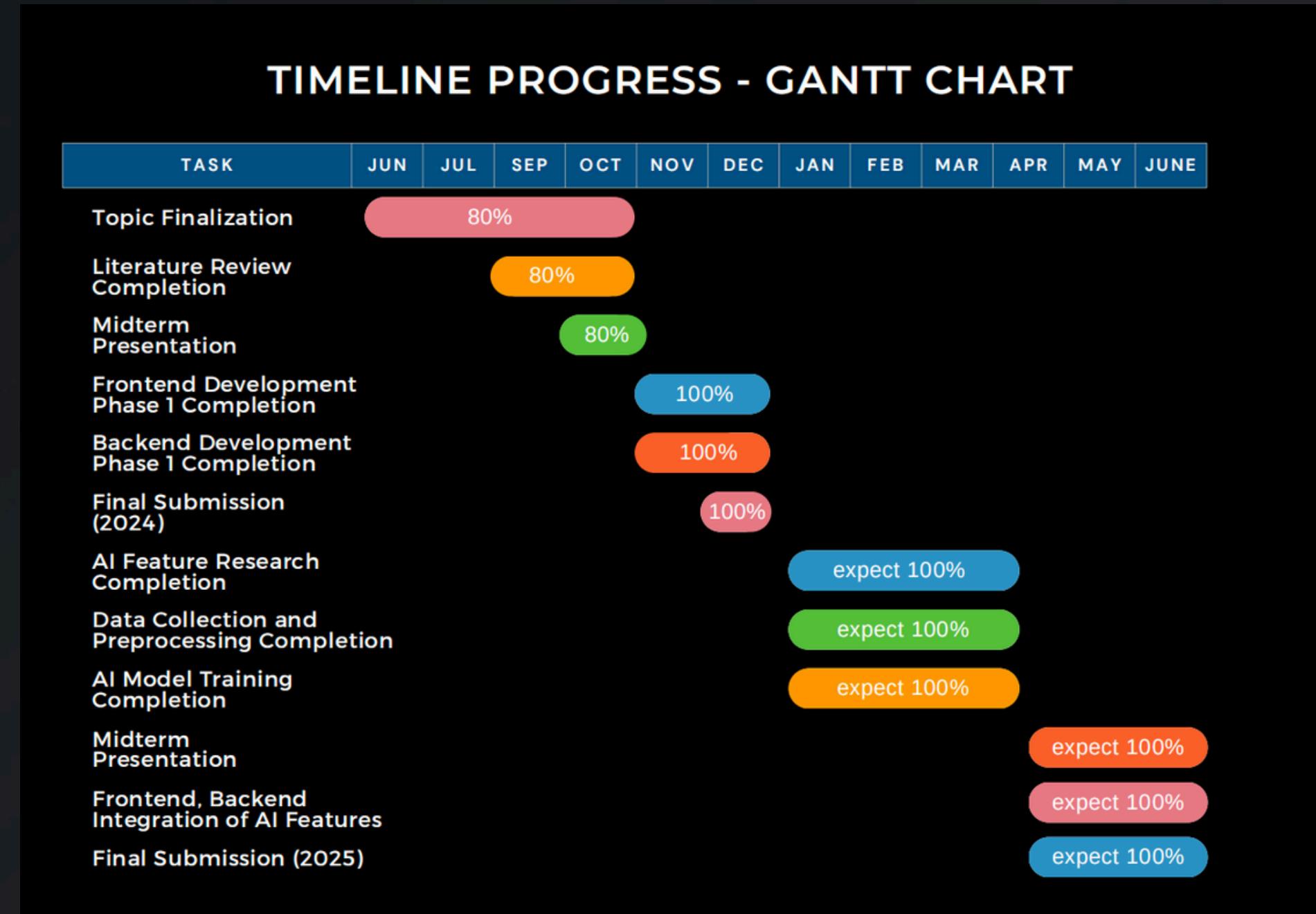
"

### Why the Shift?

While our original mission was to support Mongolia through geological research and cost-effective exploration tools, we realized that the mining sector—Mongolia's most vital industry—needed more than just technical tools. It needed centralized access to information, educational resources, and real-time updates for stakeholders across the board. Our goal remains the same: to support Mongolia, but our approach has grown.

# GANTT CHART, SUMMARY

Old Gantt chart:



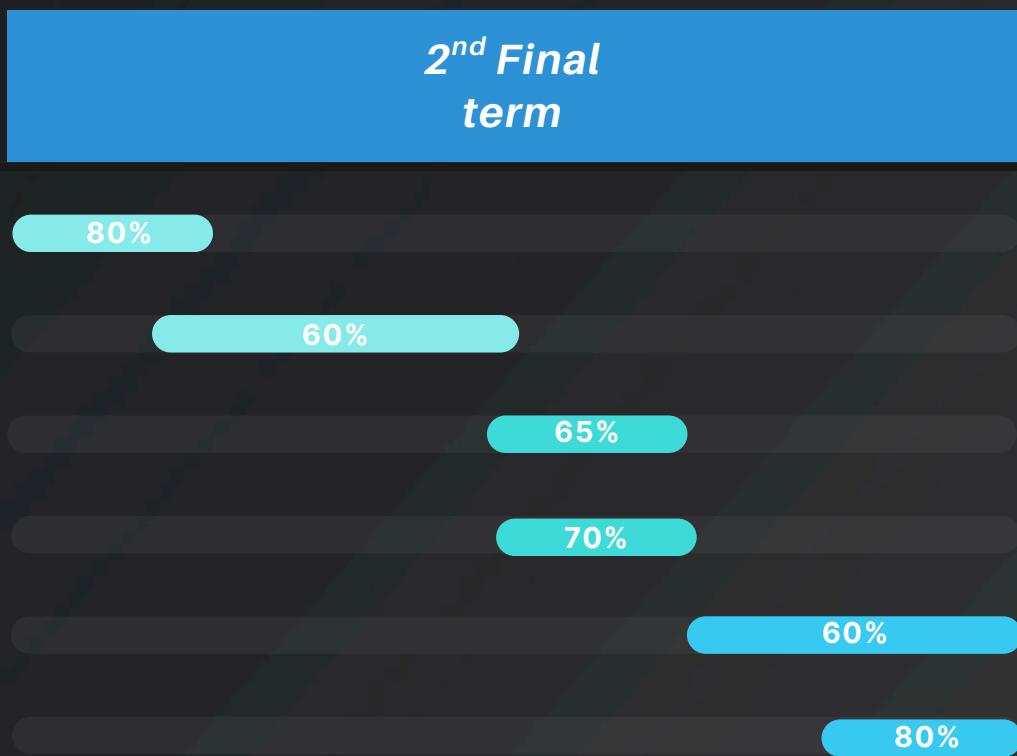
# GANTT CHART, SUMMARY

New Gantt chart:

## TO-DO'S

- AI Feature Research Completion
- Data Collection and Preprocessing Completion
- AI Model Training Completion
- Midterm Presentation
- Frontend, Backend integration of AI Features
- Final Submission (2025)

## Final Final's Gantt Chart



# SUMMARY

This year, we began with a research project on Mongolia's geology and remote sensing. We built satellite-based tools using Google Earth Engine, then advanced to machine learning for mineral prediction and secure access with NextAuth.

Now, we've evolved into the Mongolian Mining Hub (MMH)—a centralized platform offering real-time mining news, tools, education, and data. Our goal remains the same: to support Mongolia's mining sector through innovation and accessibility.

**WWW.AGULASOFT.COM**



PERFORMANCE

KNOWLEDGE

GRATEFULNESS

For our manpower,  
budget, knowledge.  
This project was big  
step for us.

---

# THANK YOU

---

WE WERE TEAM 6