IAMG-IITB Student Chapter

organizes

BHOOMATHON

National level mathematical geoscience hackathon

at

Department of Earth Sciences
Indian Institute of Technology Bombay
Powai, Mumbai, Maharashtra-400076

Theme:

"AI-driven coal quality estimation using geophysical data"

TEAM SIZE
2-4 MEMEBERS

REGISTRATION DEADLINE
APRIL 4, 2026

First Prize
10,000 INR
Second Prize
7,000 INR
Third Prize
5,000 INR

Round 1
First week of May

Round 2
Second week of May

https://forms.gle/d4D8ooNyehejX6dK7

SCAN TO REGISTER

For joining/renewing your IAMG membership the following link can be used:
https://iamg.org/become-a-member/

For queries and more information feel free to contact:
Mridul Yadav (President, IAMG-IITB Student Chapter; mridulyadav@iitb.ac.in)

Problem Statement

Background:

As per Indian Standard Practice (ISP) norms 2022, based on Gross Calorific Value (GCV), derived from coal analysis laboratory, coal quality is estimated and categorized into various graded (G1 to G17 for non-cocking coals). Laboratory derived method of coal quality estimation is the only direct method which has limitations such as limited availability of resources for analysis, time and cost intensive. Moreover, the quality information obtained is from borehole samples which is a point information and the interpolation between boreholes is the only options to derive lateral changes in the coal quality.

B.K. Mazumdar formula to derive Gross Calorific Value (GCV) = 85.6[100-(1.1A+M)-60M Kcal/Kg

Where A stands for Ash & M stands for Moisture.

Issues:

1. Reduction of interpolation of coal quality data
2. Estimation coal quality form indirect methods other than laboratory analysis.
3. GCV depends mainly on chemical composition and not just physical properties measurable by logs (density, resistivity, sonic velocity, gamma ray).
4. GCV (Gross Calorific Value) cannot be derived solely from geophysical logs or seismic data, because GCV depends on organic carbon content and proximate analysis parameters (moisture, volatile matter, ash, fixed carbon) which require laboratory testing of coal samples. However — it can be estimated indirectly using a workflow that links geophysical responses to coal quality, and then quality → GCV.

Probable approaches:

1. If laboratory coal quality data is correlated with geophysical logs, development of predictive models deep learning techniques for estimation of coal quality may be possible.
2. Seismic data is continuous information that required limited or less interpolation in comparison with borehole data. Integration of geophysical logging and seismic data for application of deep learning techniques for estimation of coal quality is another best method.

Mandatory rules:

- Team lead must be a **student member of IAMG**
- Each team should consist of 2 to 4 members amongst which **at least one of the team members must be IAMG student member**
- It is desirable to have students from different domains of geosciences (for example: geology, geophysics, etc.) but not mandatory