



# Maitreya Mohan Sahoo

*Assistant Professor*

*Department of Mining Engineering*

*Indian Institute of Technology (Indian School of Mines), Dhanbad*

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## Research Areas

*Remote Sensing, Geographical Information System, Geological Spectroscopy, Digital Image Processing, Hyperspectral Mixing and Unmixing, Machine Learning*

## Education and Experience

**July 2025 and continuing:** Assistant Professor at the Department of Mining Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, India

1. Faculty member of the Surveying, Geomatics and Mine automation, AI/ML research groups
2. Assistant editor of the Mining Edge Newsletter

**Oct 2023 to July 2025:** Postdoctoral Researcher at The Hebrew University of Jerusalem, Israel

PI: Dr. Ittai Herrmann, research:

1. Multimodal remotely sensed data integration for crop trait estimation and identifying combined nitrogen and irrigation stress for field-grown sesame.
2. Time series analysis of remotely acquired spectral data for developing crop growth and yield prediction models in sesame.
3. Spectral phenotyping of wheat cultivated at varying soil and nitrogen fertilization.
4. Spectral determination of herbicide resistance in Amaranthus.

**Apr 2021 to May 2022:** Visiting Research Fellow at The Hebrew University of Jerusalem, Israel

Supervisor: Dr. Ittai Herrmann, research:

1. Estimation of carnosic acid content in *in vivo* Rosemary plants using spectral measurement techniques.
2. Modelling spectral phenotyping techniques for trait estimation at leaf and canopy levels in field-grown sesame.

**July 2018 to Dec 2023:** Ph.D. in *Geoinformatics and Natural Resources Engineering (GNR)* at Indian Institute of Technology, Bombay

Supervisor: Prof. Alok Porwal

Ph.D. Topic: *Modelling Spectral Unmixing for Geological Mixtures*

**Aug 2016 to July 2018:** Assistant Manager at Coal India Limited

Job Role: Coal production, machinery supervision, manpower and materials management.

**July 2012 to June 2016:** Bachelor of Technology in *Mining Engineering*, from National Institute of Technology, Rourkela

Supervisor: Prof. B.K. Pal

B.Tech. Project: *Opencast Mine Modeling, Grade Optimization using Surpac, and Haul Road Optimization*

## Research Highlights and Skills

- Development of **spectral unmixing** techniques for **rocks and geological mixtures** using various state-of-the-art techniques
- Development of **Hapke's model-based spectral unmixing techniques** and their implementation on rock samples
- **Instrumentation** of imaging spectroradiometer-based measurements using precise translation stage (Designed at Udaipur Solar Observatory, A research unit of Physical Research Laboratory, India)
- Proficient in the operation of **lab and field based spectroradiometers** and **hyperspectral cameras** for spectral measurements (ASD models, Hypex models, PolyPen, FLIR thermal camera)
- Exposure to **UAV-based data acquisition** (Maverick, DJI and Phantom) and multimodal image processing (Pika L cameras)
- Proficient in **image processing and GIS softwares** (ENVI, ERDAS, ArcGIS, SNAP, Pix4D Mapper, Resonon)
- Proficient in **programming and numerical simulation softwares** (Python, MATLAB, R, IDL) and **geoprocessing packages** (Osgeo, GDAL, RasterIO)
- Preliminary experience with **CRISM** and **HiRISE** datasets for **Martian surface mapping** and **Moon mineralogical mapper** dataset of Chandrayaan for lunar regolith study
- Preliminary exposure in programming and operating Arduino microcontroller board and stepper motor driver controller for automation techniques

## Awards and Certifications

- Sustainable Intensification Innovation Lab (SIIL) Travel Stipend for attending the 16th International Conference on Precision Agriculture (ICPA) at Manhattan, Kansas, USA (2024)

- The Hebrew University and Lady Davis fellowship (The Pikovsky – Valazzi fund) for conducting postdoctoral research in Israel (2023)
- IEEE Geoscience and Remote Sensing Society Travel Grant for attending the 2023 IEEE International Geoscience and Remote Sensing Symposium at Pasadena, California, USA (2023)
- Best poster presentation award at the Indian Planetary Science Conference-2023, held on 22-24 March 2023 at Ahmedabad, India (2023)
- Ph.D. Sandwich Scholarship awarded by The Council for Higher Education, State of Israel (2021)
- Awarded Prime Minister's Research Fellowship (PMRF) for Ph.D. research at Indian Institute of Technology Bombay, Ministry of Education, Government of India (2018)
- Awarded 'Medhabruti Scholarship for Meritorious Students' by Government of Odisha (2012)

### Professional Memberships

- American Geophysical Union (AGU)
- European Geosciences Union (EGU)
- Institute of Electrical and Electronics Engineers (IEEE)
- Geoscience and Remote Sensing Society (GRSS), IEEE
- International Plant Phenotyping Network (IPPN)
- International Weed Science Society (IWSS)

### Current courses / Courses taught

| Session      | Course code and name                                   | Institute                                           | Role       |
|--------------|--------------------------------------------------------|-----------------------------------------------------|------------|
| Monsoon 2025 | NMND502- Geospatial Technologies for Natural Resources | Department of Mining Engineering, IIT(ISM), Dhanbad | Instructor |
| Monsoon 2025 | NMND507- UAV Data Mapping and its Applications         | Department of Mining Engineering, IIT(ISM), Dhanbad | Instructor |
| Monsoon 2025 | NMNC514- Advanced Surveying Practical                  | Department of Mining Engineering, IIT(ISM), Dhanbad | Instructor |

### Education Outreach

| Year               | Programme                                                                                           | Organizer and Sponsor                                                                                                      | Role            |
|--------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------|
| 10 – 14 June, 2025 | ANRF Sponsored Workshop on Geospatial Intelligence: Applications and Challenges in the Big Data Era | Indian Institute of Information Technology, Sri City<br>Anusandhan National Research Foundation, Department of Science and | Resource person |

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|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                                  |                                                                                                                                                    | Technology, Government of India                                                                                                                                                                   |                    |
| 14 Jan – 14 Feb, 2024            | Skill Development Programme in Artificial Intelligence                                                                                             | Madhya Pradesh State Skill Development and Employment Generation Board<br>Foundation for Innovation and Technology Transfer (FIIT),<br>Indian Institute of Technology, Delhi                      | Instructor         |
| 25 – 31 July, 2023               | High-End Workshop (Karyashala) on Geospatial Intelligence and Applications                                                                         | Indian Institute of Information Technology, Sri City<br>Accelerate Vigyan Programme<br>Science and Engineering Research Board, Department of Science and Technology, Government of India          | Session instructor |
| 14 – 25 Mar, 2023                | ATAL-sponsored Faculty Development Programme on Supply Chain Management: Opportunities and Challenges for Academicians, Scientists & Technologists | Indian Institute of Information Technology, Sri City<br>AICTE Training and Learning Academy                                                                                                       | Speaker            |
| Sept – Dec, 2021                 | Online course on ‘Remote Sensing and Geographic Information System’                                                                                | Department of Mining Engineering, National Institute of Technology, Rourkela<br>Technical Education Quality Improvement Program phase III (TEQIP-III), Ministry of Education, Government of India | Presenter          |
| Spring 2022-23                   | GNR 602- Advanced Satellite Image Processing                                                                                                       | Centre of Studies in Resources Engineering, Indian Institute of Technology, Bombay                                                                                                                | Teaching Assistant |
| Autumn 2022-23<br>Autumn 2020-21 | GNR 627- Natural Resources Potential Modelling                                                                                                     | Centre of Studies in Resources Engineering, Indian Institute of Technology, Bombay                                                                                                                | Teaching Assistant |
| Spring 2019-20                   | GNR 633- Remote Sensing and GIS Applications to Mineral and Hydrocarbon Exploration                                                                | Centre of Studies in Resources Engineering, Indian Institute of Technology, Bombay                                                                                                                | Teaching Assistant |
| Autumn 2019-20                   | GNR 603- Principles of Remote Sensing                                                                                                              | Centre of Studies in Resources Engineering, Indian Institute of Technology, Bombay                                                                                                                | Teaching Assistant |