

Focused Session- Intelligent Sensing System for Sustainable Mining and Minerology

Web description:

The global mining and mineral industry are undergoing rapid transformation driven by the clean energy transition and the growing demand for critical minerals. As mining extends into deeper and more complex environments, challenges related to worker safety, ground stability, equipment interactions, and environmental risks are increasing. This session invites contributions on advanced sensing technologies—including ultrasound, optical, geotechnical, gas detection, ventilation monitoring, communication systems, and autonomous inspection platforms—that enable real-time monitoring, enhanced situational awareness, and proactive risk management for safer and more sustainable mining operations.

A central focus is the integration of AI-powered sensing through sensor fusion, deep learning, and edge analytics to improve hazard detection, equipment health monitoring, and operational decision-making. The session will also address environmental challenges such as tailings risks and spontaneous coal combustion, highlighting emerging technologies including EM/RF, hyperspectral imaging, satellite-based deformation tracking, and photoacoustic monitoring for continuous environmental oversight. By bringing together researchers, innovators, and industry leaders, the session will showcase how intelligent sensing is enabling safer, greener, and future-ready mining systems.

Organizers List:

1. Dr. Abhijeet Gorey,
Scientist, TCS Research, India
Email: abhijeet.gorey@tcs.com
2. Prof. Devi Prasad Mishra
Dept. of Mining Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, India
Email: dpmishra@iitism.ac.in
3. Prof. Gang-Ding Peng
School of Electrical Engineering and Telecommunications, UNSW, Sydney, Australia
Email: g.peng@unsw.edu.au