

## BRIEF BIO-DATA

**1. Name:** Dr Ranjan Kumar

**2. Current Position and Address (Include Email ID and Contact Number):**

Senior Principal Scientist

Underground Mining Methods, CSIR-Central Institute of Mining and Fuel Research  
Dhanbad-826001, Jharkhand, India

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**3. Educational qualifications: (Graduation and above):**

Sl. No.	Degree	Year of Passing	University/ Institute	Subject
1.	B.Sc. (Engineering)	2000	BIT Sindri	Mining Engineering
2.	M.Tech.	2002	IIT Kharagpur	Reliability Engineering
3.	Ph.D.	2009	Kyoto University	Engineering

**4. Work experience:**

Designation	Institute/company	From	To	Nature of Work
Scientist-B	CMRI, Dhanbad	May 2002	May 2005	Research and Development in the mining sector
Scientist-C	CSIR-CMRI, Dhanbad	May 2005	May 2009	
Senior Scientist	CSIR-CIMFR, Dhanbad	May 2009	May 2013	
Post-doctoral Fellow	KTH Stockholm, Sweden	April 2013	April 2015	
Principal Scientist	CSIR-CIMFR, Dhanbad	May 2013	May 2020	
Sr. Principal Scientist	CSIR-CIMFR, Dhanbad	May 2020	Continuing	

**5. Work Area(s)/ Specialization:**

Underground mining covering mechanization, ground control, mine design simulation, geotechnical reliability, and structural safety.

**6. Major contributions: (Max. 100 words):**

- Designed the indigenous extraction methods for mechanized mines under varying geomining conditions.
- Standardized the induced caving design for hard roof management in coal mines.
- Designed the stable pillars in trunk roadway being developed by bolter miners.
- Designed the strata instrumentation and monitoring plans in the development/depillaring panels of different coal mines.
- Developed a real-time ground safety analysis system for underground mines (TRL-5).
- Designed a novel design of couplers of dual height rock-bolts (TRL-3).

**7. No. of Research Publications:**

- Papers in Journals: 17
- In conference proceedings: 23
- Invited lectures delivered: 3
- List of best 05 publications
  - ❖ Ranjan Kumar, Arka Jyoti Das, Prabhat Kumar Mandal, Rana Bhattacharjee, Subhashish Tewari. Probabilistic stability analysis of failed and stable cases of coal pillars. International Journal of Rock Mechanics and Mining Sciences, 144 (2021), 104810.

- ❖ Ranjan Kumar, Prabhat K. Mandal, Ashish Narayan, and Arka J. Das. Evaluation of load transfer mechanism under axial loads in a novel coupler of dual height rock bolts. *International Journal of Mining Science and Technology*, 31(2), pp.225-232.
- ❖ R. Kumar and A.K. Ghosh. The accident analysis of mobile mine machinery in Indian opencast coal mines. *International Journal of Injury Control and Safety Promotion*, 21(1), pp.54-60.
- ❖ R. Kumar, K. Izui, M. Yoshimura, and S. Nishiwaki. Multiobjective Hierarchical Genetic Algorithms for Multilevel Redundancy Allocation Optimization. *Reliability Engineering & System Safety*, vol. 94 (4), pp. 891-904.
- ❖ R. Kumar, K. Izui, M. Yoshimura, and S. Nishiwaki. Multilevel Redundancy Allocation Optimization using a Hierarchical Genetic Algorithm. *IEEE Transaction on Reliability*, vol. 57(4), pp. 650-661.

- **Books/Chapters authored/edited: 3**

### **8. List of 5 Major Contract R&D Projects:**

- a. GAP: "Design and stability of pillars/arrays of pillars for different mining methods in coal mine workings", funded by Ministry of Coal.
- b. GAP: "Design of Real-Time Prognosis System (RTPS) for Overall Cost Reduction and Safe Operation of Mobile Machinery: Show-cased Demonstration of Dumper Fleet", funded by CIL R&D board.
- c. FBR/NCP Project: "Roof rock reinforcement system (R3S) for mine roadways intersection under varying geomining conditions" funded by CSIR.
- d. FYP Network Project: "Methodology for extraction at greater depths (>300 m) for Indian geomining condition", funded by CSIR.
- e. FYP Network Project: "Selection, adoption and modification of suitable mining equipment and system for extraction of beach placer above the water table", funded by CSIR.

### **9. Name of Patents/Copyrights applied /granted/commercialized:**

- R. Kumar, G. Banerjee, and N. Kumar. Dual Height Partial Recoverable Bolt. patent filed on 08.09.2017 (IN201811040691).
- R. Kumar, D. Kumbhakar, S.K. Mandal, J.K. Singh. Real-Time Ground Safety Analysis System for Mines. patent filed on 07.07.2018 (IN201911046581).
- R. Kumar, A. Narayan, A. Hussain, N. Kumar. Self-Retractable Cover System for Dump Trucks, patent filed on 28.03.2019 (IN201911017477).

### **10. Honors/Awards/Recognitions/Fellowships/Scholarships/Professional Memberships received:**

- Deshpande Atkinson award, North America BIT Alumni Association, 2000.
- Monbusho Scholarship, Japanese Government, 2005.
- KTH Post-doctoral Award, Swedish Government, 2013.
- Life member, The Mining, Geological & Metallurgical Institute Of India, 2015.
- Fellow (Mining Engineering), Institution of Engineers, 2018.

### **11. Societal Contributions:**

- Contributed to mine safety research projects to make miner's life safer.
- Participated in CSIR-800 activities in a tribal village of Govindpur Block (2015-16).
- Worked with Jharia Rehabilitation and Development authority in socio-economic survey and assessments during 2010-2013.