Dr. Mahesh Kumar Shriwas
Assistant Professor
Department of Mining Engineering
National Institute of Technology Rourkela - 769008
Email: shriwasmk@nitrkl.ac.in
Contact: (+91) 7008951710

Educational Details

- **Ph.D.** 2014, Department of Mining Engineering, University of Utah, USA

  Thesis: Application of Genetic Algorithms to Determine the Best Combination of Main and Booster Fans
- **M.S.** 2010, Department of Mining Engineering, Indian Institute of Technology, Kharagpur, India.

  Thesis: Flow Behavior and Velocity Pressure Recovery in an Axial Flow Fan Duct System
- **B.E.** 1996, Department of Mining Engineering, Guru Ghasi Das University, Bilaspur, India.

  Thesis: Ventilation Problems and Solutions

Research interests: Heat and Humidity Control, Optimization of Ventilation Network, Ventilation Monitoring and Control, CFD Modeling of Mine Ventilation.

Teaching interests: Mine Ventilation, Mine Fire, Geostatistics, Computer Applications in Mining Industry,

Professional Skills

- Feasibility and Engineering Analysis of Underground Mine Environment, Ventilation Survey, Design of Cooling System, Ventilation Planning and Design through VnetPC and Ventsim, Ventilation Monitoring and Control using Sensors, Spontaneous Heating and Fire Control.
- Mine Ventilation Optimization, Ventilation Monitoring and Control, Recirculation Detection and Remedy Measures
- Hazard Identification and Risk Analysis

Software Skill: C++, Python, VnetPC, Ventsim, CLIMSIM, Mine Fire, Minitab, Evolver and TORA, CFD

Teaching and Research Experience

Dec 14, 2020 – Present: Assistant Professor, Department of Mining Engineering N.I.T. Rourkela.

- Teaching Advanced Mine Ventilation
- Developing research proposals in area of mine ventilation

Aug 09, 2020 – Dec 12, 2020: Post-Doctoral Fellow, Department of Mining and Geological Engineering University of Alaska, USA

- Taught an undergraduate course "Quantitative Methods in Mining Engineering"
- Developed research proposal for funding agency- EPA, NIOSH, Mining Industry.

June 10, 2019 – June 06, 2020: Post-Doctoral Fellow – Mineral Industry Research Laboratory, University of Alaska, Fairbanks, USA

- Developed research proposals for funding agency- EPA, NIOSH
- Worked on a bioreactor for acid mine water treatment

July 10, 2018 – June 04, 2019: Professor – Acharya Institute of Technology, Bangalore, India

- Taught Courses- Environmental Impacts of Mining, Occupational Health & General safety, Mine Machinery

- Conducted National Conference on “Recent Advances in Mining Technology-2019” as a Convenor
- Worked as a Department Research Coordinator and GATE Coordinator
- Worked as a member in Department Academic Committee

Feb 02, 2018 – May 12, 2018: Term Instructor Mining Engineering – University of Alaska Fairbanks, USA

- Taught courses: Underground Mine Environment, Operations Research and Computer Application in Mining Industry

March 20, 2015- Aug 18, 2017: Regular Fellow – National Institute for Occupational Safety and Health, Spokane, WA, USA

- Conducted literature review on ventilation monitoring and control devices and their application in mines.
- Worked on Ventsim modelling of a mine
- Worked on coding a multi-fan selection program in C++
- Developed a safety plan for a laboratory ventilation model

Sep 01, 2014- March 15, 2015: **Research/Teaching Assistant – University of Utah, Salt Lake City, USA**

- Supervised ventilation experiment conducted by undergraduate and graduate students
- Graded mine ventilation laboratory report and homework submitted by undergraduate and graduate students
- Assisted in Ventsim and VnetPC modelling of ventilation system of mines
- Worked on pressure balancing model between gob and airways to control spontaneous heating

Aug 22, 2011- July 31, 2014: **Graduate Research Assistant – University of Utah, Salt Lake City, USA**

- Worked on VnetPC and Vnetsim modelling of mines
- Developed a fan selection program for a multiple fan underground ventilation mine network
- Developed a recirculation detection and quantification program
- Conducted ventilation survey in mines and prepared report
- Identified hazard and assessing risk associated with booster fan utilization in coal mines

Oct 29, 2003- July 31, 2011: **Junior Technical Superintendent – Indian Institute of Tech. Kharagpur, India**

- Designed physical evasee model to recover the kinetic energy to pressure energy
- Designed experimental setup for friction losses in axial flow fan-duct ventilation system
- Worked on a chemo-bio reactor to treat the acid mine water.

Dec 22, 2001-Oct 28, 2003: Lecturer – Chouksey Engineering College, Bilaspur, India

- Taught Courses: Surveying, Industrial Management

Aug, 2000-April 2002: **Part Time Lecturer – Govt. Engineering College, Bilaspur, India**

- Taught Courses: Mine Ventilation, Mine Environment

Sep 09, 1996- July 18, 2000: **Lecturer– Govt. Polytechnic, Khirsadoh, Chhindwara, India**

- Taught Courses: Mine Ventilation, Mine Environment

Mining Internship

- 1993: Rajnagar Mine, 1994: Gevera Project, 1995: Kolar Gold Field, India

Mine Visits in United States

- **2012: Twentymile Coal Mine** – Conducted ventilation survey and worked on ventilation modelling and prepared report
- **2012 Experimental Mine (Missouri Science &Technology University)** – Conducted ventilation survey and worked on ventilation modelling and prepared report
- **2013 Skyline Mine** – Conducted ventilation survey and worked on ventilation modelling and prepared report
- **2013: San Juan Coal Mine** – Conducted ventilation survey and worked on Ventilation modelling and prepared report
- **2014 Leeville Mine** – Researched with mine engineer about potential application of booster fans in underground metal mine
- **2014: Prairie's Power Generating Company Mine** – Conducted ventilation survey and worked on ventilation modelling and prepared report

Courses (Ph.D. and M.S. program)

- Advanced Mine Ventilation, Mine Ventilation and Air Conditioning, Fire Safety, Industrial Hygiene and Safety, Data Structure and Algorithm, Advance Algorithms, Health and Safety Management System, Risk Management, System Safety, Mine Risk Optimization, Operation Research, Process Engineering Statistics, Industrial Water Management and Control

Professional Association

- Member, North American/US Underground Ventilation Committee of SME
- Member, Society of Mining and Metallurgical Engineering since 2011
- Reviewer of *Journal of Sustainable Mining*
- Reviewer of *Acta Montanistica Slovaca* (http://actamont.tuke.sk/eb.html)

Honors and Awards

- 1987: Merit scholarship certificate in high school examination, India

International Conferences

- 2008 Indo-Korean Joint International Symposium on Geo-sci. & Technology, Kharagpur India
- 2009 9^{th} International Mine Ventilation Congress, New Delhi India
- 2012, 2013, 2014, 2015, 2016 and 2017 SME Annual Conference
- 2012 Mine Expo, Las Vegas, Nevada
- 2015 APCOM Conference, Fairbanks, Alaska

Publications List

International Journal

1. **Shriwas, M.**, Pritchard, C., 2020, "*Workplace Risk Assessment and Control of Fires and Explosions in Underground Coal Mines*" International Journal of Mining and Mineral Engineering, Vol. 11, No. 3, pp. 228-239.
2. **Shriwas, M**., Pritchard, C. 2020, "*Ventilation Monitoring and Control in Mines*" Mining, Metallurgy and Exploration, Vol. 37, pp. 1015-1021.
3. **Shriwas, M**., and Calizaya, F., 2018, "*Automation in Detection of Recirculation in a Booster Fan Ventilation Network"* International Journal of Mining Science and Technology, Vol. 28, Issue 3, May 2018, Pages 513-517.
4. Calizaya, F., Nelson, M.G., and **Shriwas M.**, 2013, "*Risk Assessment for the Use of Booster Fans in Underground Coal Mines*", Mining Engineering, Vol. 66, No. 3, pp. 52-57.

International Conferences

1. **Shriwas, M**., and Calizaya, F., 2016, "*Effect of Controlled Recirculation on Buildup of Methane Concentration in a Sample Booster Fan Network*", Proceedings of Society of Mining, Metallurgy & Exploration Annual Conference, Phoenix, Arizona, **Pre-print No 16-101**.
2. **Shriwas, M**., and Calizaya, F., 2015, "*Optimal Combination of Main and Booster Fans Pressure - Application of Genetic Algorithms"*, Proceedings of 15th North American Mine Ventilation Symposium, Blacksburg, Virginia pp. 69-78.
3. **Shriwas, M**., and Calizaya, F., 2015, "*Application of Genetic Algorithm for Solving Multiple Fan Ventilation Networks*" Proceedings of the 37th International Symposium Application of Computers and Operations Research in the Mineral Industry, Fairbanks, Alaska, pp. 488-498.
4. **Shriwas, M**., and Nelson, M.G., 2013, "*Fault Tree Analysis of Hazards Associated with the Use of Booster Fans in Underground Coal Mines*", Proceedings of 35th International Conference of Safety and Mine Research Institute, London, pp. 503-512.
5. **Shriwas, M**., Sastry, B. S., Samanta, B., 2009, "*Experimental Studies on Evasee Design Modification to Optimize its Dimensions"* 9th International Mine Ventilation Congress Dec 09-13, 2009, New Delhi, India.
6. **Shriwas, M.**, Sastry B.S., 2008, "*Experimental Studies on Performance of an Evasee with respect to Inlet Flow Conditions*" Indo-Korean Joint International Symposium on Geoscience & Technology, Feb 12-14, pp.77-85.
7. Bhattacharya, J., Das B., **Shriwas, M**., Chewong, W., 2008, "*Development of A Chemo Bioreactor for Acid Mine Drainage Treatment*" A Kigam – IIT Kharagpur Joint Research Initiative Indo-Korean Joint International Symposium on Geoscience & Technology, Feb 12-14, pp. 134-141.