BIO-DATA/ CURRICULAM VITAE

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Professional Synopsis

Currently, I have gained a total working experience of about 34 years with a teaching experience of 27 years since acquiring my first postgraduate degree (M.Tech in Mining Engineering) in 1987. Since then, I have worked in various capacities as Lecturer, Senior Lecturer & Selection Grade Lecturer/ Associate Professor for 14 years in National Institute of Technology (NITK), Mangalore, INDIA. I was with PLANNING COMMISSION, New Delhi, INDIA as Senior Research Officer (S.R.O.) for 07 years in the POWER & ENERGY Division with overall responsibility for Co-ordination among the various Energy sub-sectors (Coal , Petroleum & Natural Gas , Power and New & Renewable Energy). My responsibilities also covered the EDUCATION and ENVIRONMENT Sectors as relevant to the occasion and situation for addressing the cross-linkages between these and the Energy Sector. Since my return to NITK, I have worked as REGISTRAR of the Institute for 05 years. I have worked as Head of the Department of Mining Engineering, during 2015-17. Currently working as Professor in the department of Mining Engineering, NITK Surathkal, Mangalore, Karnataka, INDIA.

Work Experience Profile

- Lecturer in National Institute of Technology Karnataka (NITK), Surathkal, Mangalore, INDIA from 1987 to 1993.
- Senior Lecturer in National Institute of Technology Karnataka (NITK), Surathkal, Mangalore, INDIA from 1993 to 1998.
- Selection Grade Lecturer/Associate Professor in National Institute of Technology Karnataka (NITK), Surathkal, Mangalore, INDIA from 1998 to 2001.
- Senior Research Officer (S.R.O) in Planning Commission, New Delhi, INDIA from 2001 to 2007.
- Registrar in National Institute of Technology Karnataka (NITK), Surathkal, Mangalore, INDIA from 2007 to 2012.
- Head of the Department (H.O.D) in National Institute of Technology Karnataka (NITK), Surathkal, Mangalore, INDIA from 2015 to 2017.
- Professor in National Institute of Technology Karnataka (NITK), Surathkal, Mangalore, INDIA from 2010 onwards.

Academic Qualifications

Post Ph.D. Qualifications:

Course	Specialization	University /Board	Distinctions	Year of Completion
Master of Business Administration (M.B.A)	Financial Management	ANNAMALAI UNIVERSITY	Passed in First Division with Distinction	2015
Master of Arts (M.A)	Environmental Economics	ANNAMALAI UNIVERSITY	Passed in First Division with Distinction	2006

Regular Academic Qualifications:

Course	Specialization	University /Board	Distinctions	Year of Completion
Ph.D (Research Degree)	Production Optimization in Open Pit Mines through Simulation Models	MANGALORE UNIVERSITY		2003
M. Tech (Post Graduate Degree)	Mine Planning Engineering	I.I.T (B.H.U)	Passed in First Division with Distinction	1987
B. Tech (Graduate Degree)	Mining Engineering	OSMANIA UNIVERSITY (K.S.M)	Passed in First Division with Distinction	1985
Intermediate	M.P.C	Board of Intermediate Education (A.P)	Passed in First Division with Distinction	1981
SSC	State Govt. Syllabus	Board of Secondary Education (A.P)	Passed in First Division with Distinction	1979

Area(s) of Interest in Teaching/Research

- Mineral Processing Technology
- Mine Planning and Design
- Environmental Management in Mines
- Drilling Engineering
- Underground Metal Mining

Research Guidance

- Ph.D (Completed) : 03
- Ph.D (Ongoing) : 07

Innovations and Technology Transfer

- Mining Engineering Department, N.I.T.K and J.S.W, Ballari have entered into an MOU for undertaking collaborative research. Two numbers of our research scholars are working for their Ph.D on live projects. Two patents have been filed jointly by J.S.W and N.I.T.K

PATENTS

Patents Applied/Granted:

1. Title: Material handling system for screening or feeding materials with high screening efficiency and energy efficiency (Joint Patent with JSW Steels, Ballari)

Inventors:Mr. Shanmugam Bharath Kumar, Dr. Maruthiram Kaza, Dr. Harsha Vardhan, **Dr. Govinda Raj Mandela**, Dr. Rameshwar Sah, Dr. Arindam Roy Choudary, Mr. Naveena Omkarappa, Mr. Nagaraju Venkategouda

Patent application number- TEMP/E-1/53448/2018-MUM – PUBLISHED

2. TITLE: System for material beneficiation involving hydro-squeeze classifier assisted grinding ball mill (Joint Patent with JSW Steels, Ballari)

INVENTORS:Mr. Harish, Hanumanthappa, Dr. Maruthiram Kaza, Dr. Harsha Vardhan, **Dr. Govinda Raj Mandela**, Dr. Rameshwar Sah, Mr. Abhishek Kumar, Dr. Arindam Roy Choudary, Mr. Chaitanya Naik, Mr. Suhas Nayak

Patent application number:TEMP/E-1/51796/2018-MUM – PUBLISHED

3. TITLE: A system for mineral separation and process thereof combining froth floatation and gravity separation(Joint Patent with JSW Steels, Ballari)

INVENTORS:Mr. Mudhunuru Varma Raju, Dr. Harsha Vardhan, **Dr. Govinda Raj Mandela**, Mr. Harish Hanumanthappa, Mr. Bharath Kumar Shanmugam, Dr. Rameshwar Sah

Patent application number: TEMP/E-1/4060/2021-MUM– PUBLISHED

4. TITLE: Hydro-squeeze pressure filtering for the efficient beneficiation of coal material (NITK Surathkal)

INVENTORS:Mr. Harish Hanumanthappa, Dr. Harsha Vardhan, **Dr. Govinda Raj Mandela**, Mr. Bharath Kumar Shanmugam, Mr. Mudhunuru Varma Raju and Mr. Harish Kumar N S

Patent number: 396632; Application No: 202141026712; **patent granted in 11-05-2022** - ; https://patentscope.wipo.int/search/en/detail.jsf?docId=IN334769750&_cid=P21-L31E9N-19185-1

Conferences/Workshops Organized (Technical Event)

Sl. No.	Title of the workshop	Institute, Grant, Dates
1	National Conference on "Recent Developments in Art & Science of Mining",	KREC, Surathkal, January 1988.
2	National Conference on Granite Mining	KREC, Surathkal, 1996
3	National Conference on Information Technology for 21st century	KREC , Dec., 1996.
4	Global Challenges, Policy Frame work and Sustainable Development for Mining of Mineral and Fossil Energy Resources (GCPF)	National Institute of Technology Karnataka, April, 2015
5	Recent Advances in Reliability Engineering and Maintenance Management (RAREMM)	National Institute of Technology Karnataka, Under TEQIP-III, 01-03 Nov, 2018
6	Concepts of Operations Analysis and Geo-mechanics for Improved Production and Safety (COAGIPS)	National Institute of Technology Karnataka, Under Institute Fund, 11-13, Feb, 2019

Membership of Professional Bodies

- **Life member of** Indian Society for Technical Education **(I.S.T.E)**
- **Life member of** Mining Engineers Association of India **(M.E.A.I)**
- **Life member of** Indian Institute of Mineral Engineers **(I.I.M.E)**

List of Publications

Journal Publications

- Vardhan, H. & **Govindaraj, M.** (**2008**); "An experimental investigation of the sound level produced by bulldozers with various maintenance schedules"; International Journal of Vehicle Noise and Vibration; Vol. 4(2); (pp. 107 -122).

- Vardhan, H., **Govindaraj, M**. & Adhikari, G. R. (**2008**); "Experimental investigation for estimating rock properties using sound levels produced during drilling – an approach"; International Journal of Rock Mechanics and Mining Sciences.

- Vardhan, H., Adhikari, G. R and **Govinda Raj, M.** (**2009**); "Estimating rock properties using sound levels produced during drilling"; International Journal of Rock Mechanics and Mining Sciences; Elsevier; Vol.46(3); pp. 604-612.

- **Govindaraj. M,** Vardhan, H and Rao. Y. V (**2009**); "Production optimization using simulation models in mines – a critical review"; International Journal of Operations Research;Vol. 6(3-4)**.**

- **Govindaraj, M**., Vardhan, H. & Rao, Y. V. (**2009**); "Development of probabilistic simulation model for production optimization in open pit mines"; Journal of Characterization and Development of Novel Materials; Vol. 1(1); pp. 49-70.

- Rajesh Kumar, B., Vardhan, H. and **Govindaraj, M**. (**2010**); "Estimating rock properties using sound level during drilling: Field investigation"; International Journal of Mining and Mineral Engineering; Vol.2 (3); pp. 169-184.

- Rajesh Kumar, B., Vardhan, H. and **Govindaraj, M. (2011): "**Prediction of uniaxial compressive strength, tensile strength and porosity of sedimentary rocks using sound level produced during rotary drilling." Rock Mechanics and Rock Engineering; 2011; Springer; Vol.44 (5); pp.613-620. **(Impact Factor: 0.990; H Index: 22).**

- Rajesh Kumar, B., Vardhan, H. and **Govindaraj, M**. (**2011**): "A new approach for estimation of properties of metamorphic rocks." International Journal of Mining and Mineral Engineering; 2011; Inder science; Vol.3 (2); pp. 109-123.

- Rajesh Kumar, B., Vardhan, H. and **Govindaraj, M**. (**2011**): "Sound level produced during rock drilling vis-à-vis rock properties". Engineering Geology; 2011; Elsevier; Vol.123 (4); pp. 333-337. **(Five Year Impact Factor: 1.892; H Index: 48).**

- Rajesh Kumar, B., Vardhan, H. and **Govindaraj, M**. (**2012**): "Artificial neural network model for prediction of rock properties from sound level produced during drilling" Geo mechanics and Geo engineering: An International Journal; 2012; Taylor and Francis; **DOI:**10.1080/17486025.2012.661469 **(H Index: 6).**

- Balaraju Jakkula, **M Govinda Raj**, Ch. S. N Murthy (**2017**)" Effect of Process Parameters on Surface Finish and Material Removal Rate in Radial Drilling Process", Concurrent Advances in Mechanical Engineering, Vol. 3(1) 2017, pp. 7-22. DJ Publications. https://dx.doi.org/10.18831/came/2017011001.

- Balaraju J, **Govinda Raj M**, Ch.S.N.Murthy, (2020), "Application ANN Tool for Validation of LHD Machine Performance Characteristics", Journal of The Institution of Engineers (India): Series D. 101, 27–38 (2020). https://doi.org/10.1007/s40033-019-00203-3. Springer, (SCOPUS).

- Balaraju J, **Govinda Raj M**, Ch.S.N.Murthy, (2020), "Performance Evaluation of Underground Mining Machinery: A Case Study", International Journal of Failure Analysis and Prevention, Vol. 20, 1726–1737 (2020). https://doi.org/10.1007/s11668-020-00980-0. Springer, (SCOPUS).

- Balaraju J, **Govinda Raj M**, Ch.S.N.Murthy, (2020), "Prediction of Load-Haul-Dumper(LHD) Machine Performance Characteristics Using Feed-Forward-Back-Propagation Ann Model ", International Journal of Mechanical and Production Engineering (IJMPE), pp.58-66, Vol.8,No.3.

- Balaraju J, **Govinda Raj M**, Ch.S.N.Murthy, (2021), "Reliability, availability and maintainability (RAM) investigation of Load Haul Dumpers (LHDs): a case study". International Journal of System Assurance Engineering and Management, Vol.13, No.4, https://doi.org/10.1007/s13198-021-01154-3. Springer, (SCOPUS).

- Balaraju J, **Govinda Raj M**, Ch.S.N.Murthy, (2021), "Reliability block diagram (RBD) and fault tree analysis (FTA) approaches for estimation of system reliability and availability – a case study", International Journal of Quality & Reliability Management, Vol. 38 No. 3, pp. 682-703. https://doi.org/10.1108/IJQRM-05-2019-0176 Emerald, (SCOPUS).

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa; Comparison of the predictive model performance of Taguchi's L27 and Box Behnken design optimization method for separating coal in vibrating screen, International Journal of Coal Preparation and Utilization, Taylor & Francis; 2022; https://doi.org/10.1080/19392699.2022.2051700. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa; Comparison of the prediction performance of separating coal in separation equipment using machine learning based cubic regression modelling and cascade neural network modelling, International Journal of Coal Preparation and Utilization, Taylor & Francis; 2022; https://doi.org/10.1080/19392699.2022.2040492. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa, ANN modeling and residual analysis on screening efficiency of coal in vibrating screen, International Journal of Coal Preparation and Utilization, Taylor & Francis; 2021.DOI: 10.1080/19392699.2021.1910505. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa, Investigation on the operational parameters of screening coal in

the vibrating screen using Taguchi L27 technique, International Journal of Coal Preparation and Utilization, Taylor & Francis; 2021, DOI: 10.1080/19392699.2021.1957854. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa, Application of fractional factorial design for evaluating the separation performance of the screening machine, International Journal of Coal Preparation and Utilization, Taylor & Francis; ; 2021. DOI: 10.1080/19392699.2021.1962312. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa; Regression modeling and residual analysis of screening coal in screening machine, International Journal of Coal Preparation and Utilization; Taylor & Francis; 2021. https://doi.org/10.1080/19392699.2021.1923488. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa; Artificial neural network modeling for predicting the screening efficiency of coal with varying moisture content in the vibrating screen, International Journal of Coal Preparation and Utilization; Taylor & Francis; 2021. https://doi.org/10.1080/19392699.2021.1871610; (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish Hanumanthappa: Experimentation and statistical prediction of screening performance of coal with different moisture content in the vibrating screen; International Journal of Coal Preparation and Utilization; Taylor & Francis, 2020; https://doi.org/10.1080/19392699.2020.1767606. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish. H. Screening performance of coal of different size fractions with variation in design and operational flexibilities of the new screening machine, Energy Sources Part A: Recovery, Utilization & Environmental Effects, Taylor & Francis, 2019. https://doi.org/10.1080/15567036.2019.1670291. (Impact Factor: 3.447, Q2 Journal, FWCI: 1.24)

- Bharath Kumar Shanmugam, Harsha Vardhan, **M. Govinda Raj**, Marutiram Kaza, Rameshwar Sah & Harish. H. Evaluation of a new vibrating screen for dry screening fine coal with different moisture contents, International Journal of Coal Preparation and Utilization, Taylor & Francis, 2019. https://doi.org/10.1080/19392699.2019.1652170. (Impact Factor: 2.697, Q3 Journal, FWCI: 1.69)

- Harish Hanumanthappa; Harsha Vardhan; **Govinda Raj Mandela**; Marutiram Kaza; Rameshwar Sah; Bharath Kumar Shanmugam & Suribabu Pandiri: Investigation on Iron Ore Grinding based on Particle Size Distribution and Liberation; Transactions of Indian Institute of Metals; Springer; 2020; Vol. 73(7), pp. 1853-1866 https://doi.org/10.1007/s12666-020-01999-5. (Impact Factor: 1.499, Q2 Journal, FWCI: 1.89)

- Harish Hanumanthappa, Harsha Vardhan, **Govinda Raj M**., Marutiram Kaza, Rameshwar Sah & Bharath Kumar S: Estimation of Grinding Time for Desired Particle Size Distribution and for Hematite Liberation Based on Ore Retention Time in the Mill; Mining, Metallurgy & Exploration, Springer, 2020; Vol. 37, pp. 481-492 https://doi.org/10.1007/s42461-019-00167-8. (Impact Factor: 1.413, Q2 Journal, FWCI: 1.97)

- Harish H., Harsha Vardhan, **Govinda Raj M**., Marutiram Kaza, Rameshwar Sah & Bharath Kumar S. A comparative study on a newly designed ball mill and the conventional ball mill performance with respect to the particle size distribution and recirculating load at the discharge end; Minerals Engineering, Elsevier; Vol. 145, 2020. https://doi.org/10.1016/j.mineng.2019.106091. (Impact Factor: 4.765, Q1 Journal, FWCI: 2.25)

National and International Conferences

- **Govinda Raj. M** and K. Srinivas Rao, "Material handling with high angle conveyors", National Seminar on recent developments in Art & Science of Mining, Suranthkal, Jan., **1988**.
- **Govinda Raj. M**, K. S. Rao and D.V.Reddy, "Mining thick seams – Geological Considerations" National seminar on Recent developments in Art and Science of Mining, Jan., **1988**.
- **M. Govinda Raj**, B. K. Srivastava and B.B. Dhar, "Stability of Curved pit slopes – A FEM Approach" in Indian Geotechnical Conference, Allahabad **1988**.
- **M. Govinda Raj**, Sampurna Rao, K.S. Rao and P. Srinivas, "Human factors in Mining – A crucial aspect of Mechanisation", in 5th National Convention of Mining Engineers, Kudremukh Feb, 28, March **1990**.
- **M. Govinda Raj**, Sampurna Rao and P. Srinivas, "Effective Communication Network – A roadway for higher productivity and Safety", in 5th National Convention of Mining Engineers Kudremukh Feb., 28, March 1, **1990**.
- **M. Govinda Raj**, "Distance learning programmes for in service Mining Engineers" 23rd Annual Convention of ISTE, KREC., Surathkal, Dev. 26th-28th, **1993**.
- **M. Govinda Raj** and Y. V. Rao, "Trends in Measurement and Monitoring of Ground Movements in open cast Mining", in Indian conference on Mine Surveying, Ramagundam March 11-12, **1995.**
- **M. Govinda Raj**, K. S. Rao and Y.V. Rao, "Heat Transfer in jointed rock mass – A FEM model in 13th conference and second ASME – ISHMT heat and mass Dec. 28-30, **1995**.
- **M. Govinda Raj**, Y.V. Rao and K. Chandra sekharan, "Computer aided learning environment for underground metal mines" – First International Conference on Educational Computing EDUCOMP 96, 19-21 March **1996**.
- **M. Govinda Raj**, Y. V. Rao and S. Sridhar, "Exploration Technologies for commercial rock deposits" in National Conference on Granite Mining, KREC, Surathkal, **1996**, pp. 31-34.
- **M. Govinda Raj**, Y. V. Rao and K.S. Rao, "Recent trends in Granite Quarrying – An overview of methods & planning" – National Conference on Granite Mining KREC, Surathkal, **1996**. pp. 140 – 142.
- **M. Govinda Raj** and Y. V. Rao, "Granite Mining and its impact on the environment"-National Conference on Granite Mining, KREC, Surathkal, **1996**, pp. 143 – 145.
- Rajesh Kumar B., Vardhan, H., **Govindaraj, M**. and Badal Yadav (**2010**); "A field investigation on the study of relationship between universal compressive strength of the rock and the sound levels produced during drilling "; Proceedings of the International conference on "Frontiers in Mechanical Engineering" during 20th and 22nd May, 2010; pp. 228-233.
- Balaraju Jakkula, **M.Govinda Raj** and Ch.S.N.Murthy (**2017**) "Performance of Load Haul Dumper in Underground Mines- An overview" International Conference on Deep Excavation, Energy Resources and Production, IIT, Kharagpur, 24th-26th Janurary,2017.

- Balaraju J, **Govinda Raj M**, Murthy Ch S N, (**2017**), "Measurement of Reliability Based Preventive Maintenance Time Intervels for LHD Machines" Proc. of First International Conference Mines of the Future, Institute of Mineral Resources Engineering, RWTH Aachen University, 23-24 May 2018, Aachen, Germany. Available in www.aims.rwth-aachen.de.
- Balaraju J, Govinda Raj M, Murthy Ch S N, "measurement of reliability based preventive maintenance time intervals for lhd machines" Proc. of First International Conference Mines of the Future, Institute of Mineral Resources Engineering, RWTH Aachen University, 23-24 May **2018**, Aachen, Germany. Available in www.aims.rwth-aachen.de.
- Balaraju J, Govinda Raj M and Murthy Ch S N, (2019), "Prediction and Assessment of LHD Machine Breakdowns Using Failure Mode Effect Analysis (FMEA)", Proc. of 4th International Conference on Reliability, Safety and Hazard (ICRESH-2019), Springer-SCOPUS, January 10-13, **2019**, IIT Madrass, Chennai.
- Balaraju J, Govinda Raj M and Murthy Ch S N, **(2019),** " Reduction of LHD Machine Subsystem Breakdowns Using Failure Mode Effect Analysis (FMEA)", Proc. of International Conference and Exhibition on Energy and Environment: Challenges and Opportunities (ENCO-2019), February 20-22, 2019, CSIR-CIMFR, Vigyan Bhawan, New Delhi, India.
- Bharath Kumar S., Harsha Vardhan., **Govinda Raj M**., Marutiram Kaza., Rameshwar Sah., Harish H., "The Shortcomings of the Vibrating Screen and the Corrective Measures: A Review", International Conference on Emerging Trends in Engineering" held at Osmania University, Hyderabad on 22-23 March 2019, Springer-SCOPUS.
- Balaraju J, Govinda Raj M and Murthy Ch S N, (2019), "Reliability Analysis of LHD Machine-A Case Study", Proc. of International Conference on Emerging Trends in Engineering, Springer-SCOPUS, 22-23, March, **2019**, Osmania University, Hyderabad.
- Jeripotula Sandeep Kumar, Mangalpady Aruna and Mandela Govinda Raj, (2019), "Evaluation of Whole Body Vibration of Heavy Earth Moving Machinery Operators", Proc. of International Conference on Emerging Trends in Engineering, Springer-SCOPUS, 22-23, March, **2019**, Osmania University, Hyderabad.
- Bharath Kumar S., Harsha Vardhan., **Govinda Raj M**., Marutiram Kaza., Rameshwar Sah., Harish H.,""Vibrating Screen: A Review", 4th International Conference on Innovations and Emerging in Mechanical Engineering held at Nagarjuna College of Engineering, Bangalore on 26-27 March **2019**.
- Harish H., Harsha Vardhan., **Govinda Raj M**., Marutiram Kaza., Rameshwar Sah., Abhishek Kumar., Bharath Kumar S., "Ball Mill Performance Study: A Review", 4th International Conference on Innovations and Emerging in Mechanical Engineering held at Nagarjuna College of Engineering, Bangalore on 26-27 March **2019**.