

## **Dr. Vageesha S. Mathada**

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### *Executive Summary:*

**Dr. Vageesha** is an enthusiastic and experienced Civil Engineer with **Masters Degree in Geotechnical Engineering from NIT, Surathkal and Ph.D. in interdisciplinary program of Reliability Engineering from IIT Bombay**. Even though he has worked in the interdisciplinary area, he has applied the reliability techniques for the safety assessment of slopes **(Civil Engg. Area, Geotechnical Engineering)**. He possesses good analytic skills and his research work involves modeling of uncertainties and evaluation of risk. He has modeled material uncertainty during his research work for the assessment of risk. He has good understanding of simulation methods like Monte-Carlo, Importance Sampling and other variance reduction techniques. He has used first order (FORM) and second order reliability methods (SORM) extensively for his research. He has around **29 years experience** (around 24 years of teaching experience in India and abroad **(Ethiopia under UNDP Scheme)** and, almost 4½ years of research). **Presently, he is working as a Professor in Civil Engineering department at Bheemanna Khandre Institute of Technology, Bhalki, Karnataka (Formerly, Rural Engg. College, Bhalki) since Feb. 2018. He has worked as Principal of College of Engineering & Research, Fabtech Technical Campus, Sangola, Maharashtra, Moodlakatte Institute of Technology, Kundapur, Karnataka and Principal of Lingaraj Appa College of Engineering, Bidar, Karnataka. He has successfully led the Moodlakatte Institute for almost one and a half years. During his stewardship, he has achieved 100% results from Visveswaraya Technological University at MIT, Kundapur. The attrition rate of the faculty was brought down drastically by him. In addition, he had been to Jimma University, Jimma, Ethiopia, Africa for a period of 5 years as a faculty member under UNDP scheme. He has good leadership and interpersonal skills and led the department at Jimma University as head of the department for 2 years in between. He has taught various courses to diploma, undergraduate and post graduate students in India and abroad. In addition, he is also guiding students for their Ph. D. degree.**

### Academic Qualifications:

Ph.D. (Reliability Engg.)	M.Tech. (Geotech. Engg.)	B.E. (Civil Engg.)
IIT Bombay, Mumbai, August 2007 CGPA (9.45 / 10.00) during course work	N. I. T., Surathkal, Karnataka, 1991 (First Class with Distinction, 79.82%)	Govt. B.D.T. College of Engg. Davangere, Karnataka, 1987 (First Class with Distinction, 71.44%)

### Ph.D. Topic at IIT Bombay, Mumbai:

#### **Fuzzy, Fuzzy-Random and Hybrid Reliability Analysis of Earth Slopes, and RBD of Earth Walls**

*Abstract:* Safety evaluation of earth slopes is a daunting task to any geotechnical engineer as it involves many uncertainties. Even proper characterization of these uncertainties is yet another complexity which we come across due to scarcity of data in geotechnical engineering. Force fitting a distribution when the data available is scarce / fuzzy may lead to an un-conservative estimation of risk. Here an attempt is made to assess the safety of earth slopes with proper modeling of uncertainties viz. probabilistic, fuzzy and fuzzy-random variables. New methodologies have been proposed for the assessment of possibility of failure when uncertain quantities are modeled as fuzzy numbers, fuzzy random and, when some are random and others are fuzzy. Eigen transformation technique is introduced for the evaluation of possibility when the fuzzy sets are correlated. The results obtained are in agreement with the Possibility-Probability Consistency Principle (PPCP) proposed by Zadeh. System reliability assessment is also carried out in fuzzy environment. Reliability based design charts have been proposed for the design of reinforced earth walls.

### M.Tech. Project at NIT, Surathkal, Karnataka:

#### **Evaluation of Bearing Capacity of Soils by Finite Element Analysis (A Nonlinear Approach)**

*Abstract:* In this project the bearing capacity of soils was computed using nonlinear finite element analysis. The stress-strain data obtained from laboratory tests on undisturbed field samples is used to model the nonlinear behavior in the system. A simple algorithm of piecewise linearization is carried out to achieve this purpose. The results were compared and validated with field PLT results.

### Selected Work Experience:

#### **Since Mar. 2018 (~ 2 Years at Bheemanna Khandre Institute of Technology, Bhalki, Karnataka)**

I am working as **Professor** in Civil Engg. Dept. In addition to my teaching I am also in-charge of M.Tech. (Geotechnical Engg.). Currently, I am handling different subjects to PG students and Geotechnical related subjects to Undergraduate students. I am also supporting the Head in running the department smoothly.

**Feb. 2017 - Jan. 2018 (~ 1 Year at N B Navale Sinhgad College of Engg., Solapur, Maharashtra)**

I was working as **Professor** in Civil Engineering Department. My responsibilities in the department were teaching (both graduate and Under-graduate students). Even though I was from Geotechnical area, I was teaching PG (Structures) students, the courses like FEM, Advances in Concrete Composites, Advanced Design of Foundations, etc.

**Dec. 2015 –Jan. 2017 (~ 2 yr. 2 months at Fabtech College of Engineering & Research, Fabtech Technical Campus, Sangola, Maharashtra)**

I was **Principal** of this college since Dec. 2014. In addition to routine work of administration, I taught Geotechnical Engineering related subjects to Civil engineering students. After my joining the first batch of the college has passed out. The placements from our college were the maximum in whole of the university (I could achieve this with the active support of the management and the active placement team, even in the era of economic slowdown in the country). The admissions were also the highest in the history of the college, this year. The attrition rate of faculty was brought down by personally talking to those who were leaving the campus.

**January 13 – Dec. 15 (~3 years at SVERI's College of Engineering, Pandharpur, Maharashtra)**

I was working as **Professor in Civil Engineering** at this college. In addition to my routine work of teaching, I was also heading the Post Graduate course of Civil Engg. (M.E.(Structures)) here. I was handling basic subjects like Geotechnical Engg., Foundation Engg., Engg. Mechanics, Structural Mechanics, etc. in various semesters. I returned to this organization as there was pressure from this organization to handle some of the civil engineering subjects (I used to come on holidays to teach some courses on holidays on request from this organization, while serving as Principal at Lingaraj Appa Engineering College, Bidar).

**May 2012 - Dec. 2012 (~ 9 months at Lingaraj Appa Engineering College, Bidar, Karnataka)**

I was working as **Principal** of the above college. Here, I was instrumental in bringing the attrition rate of faculty and maximum admissions. In addition to administrative duties, I used to teach some basic courses like Engineering Mechanics, Strength of Materials, etc. to 1<sup>st</sup> year students.

**January 2011 - May 2012 (~17 months at SVERI's College of Engineering, Pandharpur, Maharashtra)**

I was working as **Professor in Civil Engineering** at this college. In addition to my routine work of teaching, I was also heading the department there.

**October 2009 – Dec. 2010(~ 15 months at Rural Engineering College, Bhalki, Karnatka)**

I was working as **Professor in Civil Engineering** at Rural Engineering College, Bhalki. In addition to teaching, I have also been given the responsibility of overseeing AICTE / NBA / University reports for approval processes. I was also involved in third party work, consultancy for earning revenue to the college.

**Feb. 2008 – October 2009 (~20 months at Moodlakatte Institute of Technology, Kundapur)**

I was working as **Principal** of Moodlakatte Institute of Technology, Kundapur for almost 2 years. As head of the institution my responsibilities were unbound. My greater achievements during my tenure were (i) 100 % results in the outgoing batch of 2008, (ii) least attrition in the faculty (iii) Introduction of MBA, and (iv) Maximum admissions in the history of MITK since inception.

**August 2007 - February 2008 (~6 months at Bangalore College of Engg. & Tech., Bangalore)**

I was working as **Assistant Professor** in Civil Engineering department. I was involved in teaching various courses of Civil Engg. in this institute. I handled a part of Elements of Civil Engg., Geotechnical Engg., Numerical Methods in Civil Engg and Surveying Practice. In addition to teaching, I used to help my head of the department in other departmental works.

**July 2002- May 2006(~4 years at IIT Bombay)**

I was carrying out research at IIT Bombay as **Research Assistant**. In addition to research, I was involved in assisting professors in their M.Tech. teaching, consultancy etc. One of the important consultancy projects in which I was actively involved was, the safety assessment of a rock slope and reliability based design of anchors for its adequate safety. I have also assisted the professors in the department in organizing conferences, CEP courses. I have actively participated in national and international conferences/workshops in India and abroad. My basic research work is explained earlier in Ph.D. topic.

**Oct. 1997 - May 2002 (~ 5 years at Jimma University, Jimma, Ethiopia, Africa)**

I was **Lecturer** at Jimma University, Jimma for almost 5 years. We were employed by the **Ministry of Education, Federal Republic of Ethiopia under UNDP (United Nations Development Program)** scheme. Major responsibilities included the development of newly introduced technology faculty, and teaching. I was instrumental in setting up of various laboratories, development of curricula, and was **head of the department** for 2 years. Major achievements during my stewardship include managing the departmental activities with acute shortage of faculty and infrastructure with proper coordination amongst different universities in Ethiopia. I was also instrumental in the establishment of a center '**Center for Appropriate Technology and Entrepreneurship Motivation**' (CATEM) in the university for technology transfer to rural community. In addition to this, we used to undertake testing and consultancy work. I used to get consistently good feedback from students and my superiors/colleagues.

**Nov. 1992 – Sept. 1997 (~5 years at **NERIST, Itanagar, Arunachal Pradesh, A Govt. of India undertaking**)**

Here also I was **Lecturer**. The major distinction of this institute is its modular system of education, which is followed in only two institutes in India. Here one is supposed to teach all the modules (viz. base, diploma, degree) and also teach vocational courses. This inculcates **flexibility** in teaching methodology. We used to undertake consultancy for testing of soils, concrete, road metal etc. Here I was instrumental in developing computer lab of the department being incharge of it for 3 years. In addition to my regular work, I was **General Secretary** of NERIST Employees Credit and Thrift Society for 3 years and

brought automation of complete accounts of the society. I was also in the board of directors for the NERIST KG School for 4 years.

**Others:**

- 9 months as Project Associate at **Indian Institute of Science, Bangalore**.
- 1 year at Anjuman Engg. College, Bhatkal as Lecturer in Civil Engg.
- 2 ½ years at TMAES Polytechnic, Hospet as Lecturer.

**Strengths / Skills Set:**

- Experienced administrator at various capacities.
- Experienced in teaching in India and abroad.
- Good knowledge of probability and statistics and its application to real problems.
- Guiding some candidates for their Ph.D. and guided some for their Masters.
- Knowledge of Interdisciplinary area of Reliability engineering in addition to basic Civil / Geotech. Engg.
- Knowledge of statistical tools and Six Sigma.
- Good programming skills in FORTRAN, C/C++.

**Proficiency Courses Attended (Recent ones):**

- Proficiency course on **Six-Sigma (Green Belt)**, IIT Bombay (March 2005)
- Certificate Course on **Advanced Programming**, IIT Bombay (May-June 2005)
- Application of Finite Elements and Constitutive Models in Geotech. Engineering at Turin, Italy (June 2005)
- Many other STTP courses and ISTE courses.
- STTP on recent advances in earth quake engineering – SVERI
- STTP on COLLABCAD & COLLABSDD at SVERI
- Two week ISTE-IITB coordinators workshop on Applied Mechanics at IITB
- STTP on Soft Computing Methods \_SVERI
- STTP on AAKASH for education – SVERI
- Attended Faculty Development Program on 'Quality in Higher Education' by Dr. Ramesh Kasetwar, 26<sup>th</sup> Aug. and 27<sup>th</sup> Aug. 14.
- Attended one day workshop on 'Beyond Academics' by Mr. Shrikant Bachdev and Mrs. SavitaDhade at SVERI on Nov. 7, 2014. Organized by T&P cell.

**Research Interests:**

- Application of probability / statistical concepts and reliability applications to Civil / other engineering problems.
- Reliability applications to Civil/other engineering problems

- Application of Six Sigma in the industry
- Material /Uncertainty characterization, Risk assessment

*Publications:*

- International Journals : 18
  - International / National Conferences: 9
- } Details are in a separate page

*Courses taken related to Reliability Engineering during Ph.D.*

- Reliability Engineering Basic Principles
- Reliability in Engineering Design
- Credit Seminar on Evaluation of Structural Reliability by FORM

*Membership of Professional Bodies:*

- Life member of Indian Society for Technical Education (ISTE)
- Life member of Indian Geotechnical Society (IGS)
- Member of Clubs like Environmental Society, Rotary Club etc.

*Other interests:*

Music, Table Tennis and Internet Browsing

**Professional References:**

Prof. G. Venkatachalam Emeritus Professor Dept. of Civil Engg. IIT Bombay, Mumbai, India. e mail:gvee@iitb.ac.in Ph.: +91-9820605352	Prof. G. R. Dodagoudar Associate professor IIT Madras, Chennai e mail: goudar@iitm.ac.in Ph: 044-2257 4280, +91-9840328754	Prof. S. S. Bhavikatti Emeritus Professor S D M College of Engg. Dharwad Ph.: +91-98451 81252
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Date: June 20,, 2020

(Vageesha S. Mathada)

## Details of the Papers Published / Communicated and Technical Talks

### ***I) Refereed Journals***

- a) Moniuddin K., Mathada S., **Mathada V.S.**, Abhijit H. T., 'Factor of Safety and Reliability Analysis of Rock Slope using GEO5 Software', Global Research and Development Journal for Engineering, Vol. 4, Issue 10, Sep. 2019, pp.40-44.
- b) Pandurang, Mathada, V.S., Sharan Kumar, Deone Shital, 'An Experimental Study on Black Cotton Soil Treated with Renolth and GGBS', International Research Journal Engineering and Technology, Vol. 6, Issue 7, July 2019, pp. 1549-1551.
- c) Sandhyarani, **Mathada V. S.**, Sharankumar, 'Stabilization of Black Cotton Soil by using Sisal Fiber', International Research Journal Engineering and Technology, Vol. 5, Issue 8, Aug. 2018, pp.694-698.
- d) Sandhyarani, **Mathada V.S.**, Sharan Kumar, 'Effect of Lime on Engineering Properties of Expansive Soil', International Journal for Research in Applied Science & Technology, Vol. 6, Issue VIII, August 2018, pp. 540-545.
- e) Sandhyarani, C. K. Patil, **Mathada V. S.**, Bharamgoud B, 'Comparative Study on Black Cotton Soil Stabilization by using Lime and Sisal Fiber', International Journal for Innovative Research in Science & Technology, Vol. 5, Issue 1, June 2018, pp. 109-115.
- f) Sharankumar, **Mathada V. S.**, Vishwanath D., 'The Use of Copper Slag and Polypropylene Fiber to Strengthen the Engineering Properties of Black Cotton Soil', International Research Journal of Engineering and Technology, Vol. 5, Issue 6, June 2018, pp. 852-857.
- g) Mujaheduddin, **Mathada V.S.**, Moinuddin K., Poojeswari M.K., 'Stabilization of Black Cotton Soil using GGBS, Glass Fiber and Ordinary Portland Cement', International Journal for Innovative Research in Science & Technology, Vol. 5, Issue 1, June 2018, pp. 104-118.
- h) Krutika D. M., Khaja Moinuddin, Mathada V.S., Sharan Kumar, 'Strengthening of Soft Subgrade Soil Using Industrial Waste Iron Powder and Recycled Plastic Mesh', International Journal of Innovative Research and Creative Technology, Vol. 4, Issue 1, 2018, pp.23-28.
- i) **Mathada V. S.**, Khaire, H., 'Study of Effects of Polyester Fibres on Compressive Strength of Concrete', International Journal for Research in Applied Science & Engineering Technology, Vol. 4, Issue 1, Jan. 2016, pp 53-56.
- j) Aware J. R., **Mathada, V. S.**, Effect of Container Height on Base Shear of Elevated Water Tank', International Journal of Science and Research, Vol. 4, Issue 12, Dec. 2015, pp. 2123-2128.
- k) Aware J. R., **Mathada, V. S.**, 'Seismic Analysis of Cylindrical Liquid Storage Tank, International Journal of Science and Research, Vol. 4, Issue 12, Dec. 2015, pp. 552-557.
- l) Aware J. R., **Mathada, V. S.**, 'Seismic performance of Cylindrical Liquid Storage Tank, International Journal of Science and Research, Vol. 4, Issue 12, Dec. 2015, pp. 1798 – 1803.
- m) Bagal R., **Mathada, V. S.**, 'Design Optimization of Steel Truss using Open Sees and SAP 2000', International Journal of Scientific Engineering and Technology Research, Vol. 4, Issue 18, Jun. 2015, pp. 3496-3501.

- n) Gaikwad M.V, Ghogare R.B, **Mathada, V. S.**, 'Finite Element Analysis of Frame with Soil Structure Interaction', International Journal of Research in Engineering and Technology, Vol. 4, Issue 1, Jan. 2015, pp. 91-95.
- o) **Mathada, V.S.**, 'Spatial Distribution of Reliability and Risk in Slopes', International Journal of Research in Engineering and Technology, Vol.3, Special Issue:03, 634-637, 2014.
- p) **Mathada, V.S.**, Venkatachalam, G., Srividya, A. 'Slope Stability Assessment – A Comparison of Probabilistic, Possibilistic and Hybrid Approaches', International Journal of Performability Engineering., Vol. 3, No. 2, pp. (231-242), 2007.
- q) **Mathada, V.S.**, Venkatachalam, G., Srividya, A. 'Eigen Trasformation Technique for Treatment of Correlated Fuzzy Uncertainty in Slopes', Accepted for publication in Computers and Geotechnics, Elsevier.
- r) **Mathada, V.S.**, SivakumaraBabu, G. L. 'Conservative Estimation of Bearing Capacity of a Square Footing using Possibilistic Approach', Accepted for publication in ActaGeotechnica.

#### **I) Refereed Conferences/Workshops**

- a) Mallika, S., **Mathada, V. S.**, Venkatachalam, G. (2006). "Reliability Analysis of Rock Slopes – Case Studies", Proc. of 10<sup>th</sup> East Asia-Pacific Conf. on Struct. Engrg. and Construction (EASEC – 10), CD-RoM Version, Bangkok, Thailand.
- b) **Mathada, V.S.**, Venkatachalam, G., Srividya, A. 'System Reliability in Fuzzy Environment – An Application to Slopes', Proceedings of 3<sup>rd</sup> International Conference on Reliability, Safety and Hazard (Advances in Risk-Informed Technology) Mumbai, India, December 1-3, 2005, pp.611-616.
- c) Venkatachalam, G., Sabu, P., Niranjani, D., Mallika, S., **Mathada, V.S.**, Srividya, A. 'Slope Stability Evaluation at Different Scales', Proceedings of the 3<sup>rd</sup> Karl Terzaghi memorial Workshop held on October 7, 2005 at Madgaon (Goa), India, pp. 37-45.
- d) **Mathada, V.S.**, Venkatachalam, G., and Srividya, A. 'A method for Possibilistic Reliability Analysis of Slopes' Proceedings of the 9<sup>th</sup> International Conference on Structural Safety and Reliability (ICOSSAR '2005), Rome, Italy June 19-23, 2005, CD-ROM Version, pp 993-998.
- e) **Mathada, V.S.**, Venkatachalam, G., and Srividya, A. 'Spatially Distributed Reliability and Risk in Slopes', GEORISK-2004, Proceedings of International workshop on Risk Assessment and in Site Characterization and Geotechnical Design, Indian Institute of Science, Bangalore, India, Nov. 2004, pp.160-166.
- f) Venkatachalam, G., **Mathada, V. S.**, Niranjani, D. and Srividya, A., 'Fuzzy Random Reliability and Safety Evaluation of Slopes and Application to Landslides' Abstract submitted and presented during the 47<sup>th</sup> Annual Meeting of Association of Engineering Geologists (AEG 2004), Dearborn, Michigan, USA, Sept.-Oct. 2004.
- g) Venkatachalam, G., Srividya, A., **Mathada, V. S.** and Niranjani, D., 'A Hybrid A Hybrid Approach for Uncertainty Modelling in Slope Stability Evaluation', *Proceedings of National Symposium on Advances in Geotechnical Engg.(NSAGE 2004)*, Indian Inst. of Science, Bangalore, India during July 2004, pp 131-136.
- h) **Mathada, V.S.**, Venkatachalam, G. and Srividya, A., 'Evaluation of Fuzzy Reliability Index of Slopes using FOSM', *International Conference on Quality, Reliability and Information Technology (ICQRIT – 2003)*, at New Delhi, India during December 2003.
- i) **Mathada, V. S.** 'Career Opportunities in Technical Education – An Example of India', *Proc. of Workshop on Curriculum Development, Mekelle University, Mekele, Ethiopia*, August 2000, pp. 103-108.



- j) **Mathada V.S.**, 'Shallow Surface Engineering', Proc. of workshop on Ground Improvement Techniques, NERIST, Itanagar, Arunachal Pradesh, India, March 1997, pp.98-103.

### ***III Technical Talks (Only few)***

- a) Delivered a talk on 'Reliability Analysis – Future of Geotechnical Engineering' at Anjuman Engineering College, Bhatkal, Karnataka on May 2, 2005.
- b) Delivered a talk on 'Vision of Technology Faculty for Community Based Training Programme' in a symposium on CBTP in Jimma University, Jimma during July '98.
- c) Delivered a talk on 'Solar Energy Perspectives in Arunachal Pradesh' during Engineer's day celebrations at NEEPCO, Yajali during Oct.'94
- d) Delivered a talk on 'Analyses of Landslides' in a workshop on Natural Disaster Management conducted at NERIST, Nirjuli during Feb. '94.