RESUME

DR. RAJU KUMHAR

Assistant Professor

Department of Mathematics

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Brief Profile

Dr. Raju Kumhar is currently working as an Assistant Professor in the Department of Mathematics at Central University of Jharkhand, Ranchi. Prior to this role, he contributed his expertise as an Assistant Professor of Mathematics in the Department of Applied Sciences and Humanities at National Institute of Advanced Manufacturing Technology (NIAMT), Ranch. Dr. Kumhar's academic journey includes completing his M.Sc. and Ph.D. in Mathematics from the Indian Institute of Technology (ISM) Dhanbad. The area of his doctoral research was on Mathematical Modeling of Geomechanics including asymptotic analysis, modeling of physical systems, wave propagation, computational mechanics and Earthquake Seismology. Currently, he is working on the development, numerical and analytical study for solving large-scale scientific and engineering problems on advanced methods. He has also qualified CSIR-JRF and GATE in Mathematics.

Research Profile Links

Google Scholar: https://bit.ly/rajukumhar_ism

ResearchGate: https://bit.ly/rajukumhar_researchgate

Researcher Id (Scopus): https://bit.ly/rajukumhar_scopus_id

ORCID: https://orcid.org/0000-0002-6637-6911

Educational Qualifications

- **Ph.D.** in Applied Mathematics **from *Indian Institute of Technology (ISM), Dhanbad*** in the year 2021.
  Title of the Thesis: Mathematical Analysis to Study the Characteristics of Shear Wave Propagation in Earth's Layered Structures.
  Supervisor: **Prof. Santimoy Kundu**
- **M. Sc.** in Mathematics and Computing from *Indian Institute of Technology (ISM), Dhanbad* in the year 2015 with 1st division securing 83.4 %.
  Master's Dissertation: Propagation of Surface Waves in Layered Media.
  Supervisor: **Prof. Shishir Gupta**
- **B.Sc. (Hons.)** in Mathematics from *Vinoba Bhave University, Hazaribagh* in the year 2013 with 1st division securing 68.2%.

Courses Taught

UG and PG: Mathematics I, Mathematics II, Mathematics III, Partial Differential Equation, Differential Equation, Linear Algebra, Real Analysis, Complex Analysis.

Additional roles/ responsibility

- Training and Placement representative of the Department of Mathematics at Central University of Jharkhand, Ranchi.
- Supervising PG student for completing their final projects and submission of dissertations at Central University of Jharkhand, Ranchi.

Professional Experience

- ➢ Assistant Professor in Department of Mathematics at Central University of Jharkhand, Ranchi, Jharkhand (Sepetmber13, 2023 to till date).
- ➢ Assistant Professor of Mathematics in Department of Applied Sciences and Humanities at National Institute of Advanced Manufacturing Technology (NIAMT), (April 28, 2022 to September 11, 2023)

Research Interests

Modeling of Physical Systems, Wave Propagation, Computational Mechanics, Earthquake Seismology, Differential Equations.

Research Publications

1. Bhengra, N., **Kumhar, Raju**, Gupta, S., & Kundu, S. (2023). Vibrations analysis of propagation of SH-type wave influenced by a point source in a porous piezoelectric layered structure by Green's function approach**. Journal of Earth System Science**, 132(3), 135.

2. Kumar, D., **Kumhar, Raju**, Kundu, S., & Gupta, S. (2023). Analysis the dispersive nature of Love wave in fibre-reinforced composite materials plate: A Green's function approach. **Mathematical Methods in the Applied Sciences**, 46(4), 3445-3462.

3. Rajak, B. P., Kundu, S., **Kumhar, Raju**, & Gupta, S. (2022). Study of the SH-wave propagation in an MEFR layer bounded by heterogeneous viscoelastic layer and elastic half-space. **Engineering Computations**, 39(7), 2820-2844.

4. Singhal, A., Tiwari, R., Baroi, J., & **Kumhar, Raju** (2022). Perusal of flexoelectric effect with deformed interface in distinct (PZT-7A, PZT-5A, PZT-6B, PZT-4, PZT-2) piezoelectric materials. **Waves in Random and Complex Media**, 1-18.

5. Maity, M., Kundu, S., **Kumhar, Raju**, & Gupta, S. (2022). An electromechanical based model for Love-type waves in anisotropic-porous-piezoelectric composite structure with interfacial imperfections. **Applied Mathematics and Computation**, 418, 126783.

6. **Kumhar, Raju**, Kundu, S., Maity, M., & Gupta, S. (2020). Analysis of interfacial imperfections and electro-mechanical properties on elastic waves in porous piezo-composite bars. **International Journal of Mechanical Sciences**, 187, 105926.

7. Maity, M., Kundu, S., **Kumhar, Raju**, & Gupta, S. (2020). Influence of mechanical imperfection on the transference of Love-type waves in viscoelastic substrate overloaded by visco-micropolar composite structure. **Engineering Computations**, 37(9), 3407-3429.

8. Kumar, D., Kundu, S., **Kumhar, Raju**, & Gupta, S. (2020). Vibrational analysis of Love waves in a viscoelastic composite multilayered structure. **Acta Mechanica**, 231, 4199-4215.

9. **Kumhar, Raju**, Kundu, S., Pandit, D. K., & Gupta, S. (2020). Green's function and surface waves in a viscoelastic orthotropic FGM enforced by an impulsive point source. **Applied Mathematics and Computation**, 382, 125325.

10. **Kumhar, Raju**, Kundu, S., & Gupta, S. (2020). Modelling of Love waves in fluid saturated porous viscoelastic medium resting over an exponentially graded inhomogeneous half-space influenced by gravity. **Journal of Applied and Computational Mechanics**, 6(3), 517-530.

11. Kundu, S., **Kumhar, Raju**, Maity, M., & Gupta, S. (2020). Influence of point source on love-type waves in anisotropic layer overlying viscoelastic FGM half-space: Green's function approach. **International Journal of Geomechanics**, 20(1), 04019141.

12. **Kumhar, Raju**, Kundu, S., Maity, M., & Gupta, S. (2019). Study of Love-type wave vibrations in double sandy layers on half-space of viscoelastic: An analytical approach. **Multidiscipline Modeling in Materials and Structures**, 16(4), 731-748.

13. **Kumhar, Raju**, Kundu, S., Maity, M., & Gupta, S. (2019). Mechanical waves study in tri-materials bars having sinusoidally interfaces (i.e. Fiber-reinforced, Poroelastic and Isotropic). **Materials Research Express**, 6(12), 125335.

14. **Kumhar, Raju**, Kundu, S., & Kumari, C. (2019, January). Propagation of torsional wave at a corrugated interface between viscoelastic sandy medium and inhomogeneous half-space. **AIP Conference Proceedings** (Vol. 2061, No. 1).

15. Kumari, C., Kundu, S., & **Kumhar, Raju** (2019, January). Dispersion characteristics of SH wave propagation in a viscous fiber-reinforced stratified media. **AIP Conference Proceedings** (Vol. 2061, No. 1).

Books and Book Chapters

1. **Kumhar, Raju**, & Kundu, S. (2020). Effect of the Heterogeneity, Initial Stress and Viscosity on the Propagation Characteristics of Shear Wave. *Mathematical Modelling and Scientific Computing with Applications*, (pp. 137-148). Springer Singapore (**ISBN: 978-981-15-1337-4**).

Seminar/ Workshop/ Conference Participation:

International Conference:

1. Presented a paper in the **"13th International Conference on Vibration Problems (ICOVP-2017)"** organized jointly by IIT Guwahati, India and ISIK University, Istanbul Turkey. (29 Nov-02 Dec 2017)
2. Presented paper in the **"International Conference on Mathematical Modelling and Scientific Computing (ICMMSC-2018)"** organized by Department of Mathematics, IIT Indore, India. (19-21 July 2018)
3. Presented paper in the **"3rd International Conference on Recent Advances in Mathematical Sciences and its Applications (RAMSA-2019)"** organized by Department of Mathematics, JIIT Noida, India. (17-19 Jan 2019)

National Conference:

1. Presented paper in the **"National Conference on Modeling, Analysis & Simulation (MAS-2019)"** organized by Department of Mathematics and Computing, IIT(ISM) Dhanbad, India. (16-18 Dec 2019)

Workshop:

1. Participated in the **National Workshop on Computational Mathematics (NWCM-2017) Phase-I** organized by Department of Mathematics, Anna University, Chennai, Tamil Nadu, India. (02-15 March 2017)

2. Participated in the **National Training Programme in Scienti1c Computing with Mathematica** organized by Faculty Development Centre, IIT(ISM), Dhanbad, Jharkhand, India. (04-09 Dec 2017)

3. Participated in the **TEQIP-III Short Term Course on Mathematical Tools for Boundary Value Problems and Applications** organized by Department of Mathematics, IIT Kharagpur, India. (08-13 March 2020)

Membership in Scientific Organizations

- Life member of *"Society of Applied Mathematics (SAM)"*, IIT(ISM), Dhanbad (Membership No: LM/2016-2017/105)

- Life member of *"Indian Mathematical Society (IMS)"* Pune, India (Membership No: L/2018/19).

- Life member of *"Indian society of theoretical and applied mechanics (ISTAM)"*, IIT Kharagpur, West Bengal (Membership No: L/2007).

- Life member of *"Indian Science Congress Association (ISCA)",* Kolkata, India (Membership No: L40694).

- Life member of *"International Association of Engineers (IAENG)",* Hong Kong (Membership No: 277361).

Awards/ recognition

1. Qualified **CSIR-JRF (2017)** securing All India Rank 163 organized by Joint CSIR-UGC NET.

2. Qualified **GATE (2017)** securing All Indian Rank 711 organized by IIT Roorkee

3. Qualified **IIT (ISM) JRF (2016)** (Phase 2) securing All India Rank 2 organized by IIT (ISM) Dhanbad.

4. Received **Merit cum Means (MCM)** Scholarship during M.Sc. from IIT(ISM), Dhanbad, given by Govt. of India.

5. Received Scholarship during B.Sc. from VBU Hazaribagh, given by Govt. of Jharkhand.

Any Other Information

Computer Skill:

- Operating systems: Windows, Linux

- Document processing/Paper drafting: LaTex, Microsoft Office

- Technical software: Wolfram MATHEMATICA, Matlab

Reviewer of Journal:

- Served as Reviewer in *European Journal of Mechanics / A Solids* (Elsevier).

- Served as Reviewer in *The Journal of the Acoustical Society of America* (Acoustical Society of America).

- Served as Reviewer in *International Journal of geomechanics* (ASCE Library).

- Served as Reviewer in *Waves in Random and Complex Media* (Taylor and Francis Ltd.)

Place: Ranchi
Date: 26-10-2024   (Raju Kumhar)