SAURAV DUTTA

Curriculum Vitae

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RESEARCH INTERESTS

Architected Materials, Inverse Design of Materials, Geometric Computing, Deployable Structures

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EDUCATION

National Institute of Technology, Silchar, India [July 2019 – June 2023]
Bachelor of Technology (B.Tech.) | Department of Civil Engineering
Cumulative GPA: 9.03/10 (Honours)

RESEARCH EXPERIENCE

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Research Intern | Civil Engineering | Advisor: Prof. Konstantinos Karapiperis [Aug 2025 – Present]

- Surveying literature on architected granular materials.

Indian Institute of Science (IISc), Bengaluru
Research Associate | Mechanical Engineering | Advisor: Prof. Akshay Joshi [Aug 2024 – July 2025]

- Extended Bayesian-EUCLID for unsupervised segmentation and model discovery in multi-phase hyperelastic materials.
- Developed growth algorithm for material interface detection using interpretable priors.

Research Assistant | Aerospace Engineering | Advisor: Prof. Rajesh Chaunsali [June 2023 – July 2024]

- Simulated non-reciprocal damped-lattice model and wave propagation using MATLAB.
- Built a programmable pendulum with time-periodic stiffness using motors and custom Python control.

National Institute of Technology (NIT), Silchar
Undergraduate Researcher | Civil Engineering | Advisor: Prof. Atanu Sahu [Jan 2023 – May 2023]

- Simulated thermal and dynamic response of composite plates in ABAQUS.
- Learned FEM analysis, meshing strategies, and multilayered post-processing.

Indian Institute of Technology (IIT) BHU, Varanasi
Summer Research Intern | Civil Engineering | Advisor: Prof. Vishwajit Anand [May 2022 – July 2022]

- Developed MATLAB routines for seismic parameter analysis.
- Extended OpenSeismoMatlab for fragility analysis metrics.

SCHOLASTIC ACHIEVEMENTS & INVITED TALKS

- **Invited talk**: Guest Lecturer, *Wave Propagation in Designed Materials*, IISc [Nov 2023]
- AA grade in Bachelor's Thesis I and II [May 2023]
- AA grade in 17 of 27 department courses [May 2023]
- Selected for URC Funded Project, NIT Silchar [Dec 2022]
- Top 5 percentile in JEE Mains, honored by Glorius NGO [Aug 2019]
- Cleared Pre-RMO and RMO [2017]

PUBLICATIONS

Peer-reviewed Journals
(**Equal contribution*)

1. H. K. Sandhu, **S. Dutta**, R. Chaunsali, "Wave propagation in an elastic lattice with non-reciprocal stiffness and engineered damping," *arXiv preprint arXiv:2507.23761*, 2025. [Online]. Available: https://arxiv.org/abs/2507.23761

2. K. L. Chaurasiya**, **S. Dutta**, S. Kumar, A. Joshi,"Hetero-Bayesian-EUCLID: Interpretable model discovery for heterogeneous hyperelastic materials using stress-free unsupervised learning," *Computer Methods in Applied Mechanics and Engineering* (under review)

3. S. Singh, M. Kumar, **S. Dutta**, V. Anand, "Identification of critical ground motion features for seismic fragility studies considering soil-structure interaction," *J. Earthquake Eng.* (under review)

Conferences

1. A. Joshi, **S. Dutta**, S. Kumar, "Hetero-EUCLID: Simultaneously segmenting and discovering hypereleastic constitutive models of all components of a heterogeneous hyperelastic material using EUCLID," 12th *European Solid Mechanics Conference, Lyon, France* (Presentation) [July 2025]

2. **S. Dutta**, V. Anand, "Framework for Ground Motion Characterization," *Proceedings of 8 International Conference On Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamic* [Dec 2024]

LEADERSHIP ACTIVITIES

Social

- Head, Razzmatazz - Incandescence, NIT Silchar [2023]
- Head, School Genius - Tecnoesis, NIT Silchar [2022]

TECHNICAL SKILLS

Languages : Python, MATLAB, Mathematica, LaTeX, HTML, CSS, C++, C
Software : CATIA, ANSYS, COMSOL, AutoCAD, Abaqus, Dynamixel Wizard
Libraries : NumPy, pandas, Pytorch, TensorFlow, OpenCV, scikit-learn (K-means)
Hardware : Motor Control, Arduino, Embedded Sensors, U2D2, LDV, 3D Printing

REFERENCES

- **Prof. Konstantinos Karapiperis**
  EPFL, Lausanne
  konstantinos.karapiperis@epfl.ch

- **Prof. Akshay Joshi**
  IISc, Bengaluru
  akshayjoshi@iisc.ac.in

- **Prof. Rajesh Chaunsali**
  IISc, Bengaluru
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- **Prof. Vishwajit Anand**
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