Dibakar Roy Sarkar

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Education

Johns Hopkins University — USA
Ph.D., Civil and System Engineering, Advisor: Dr. Somdatta Goswami — *(Aug 2024 – Present)*

Indian Institute of Technology, Madras — India
M.Tech., Civil Engineering, CGPA: 9.22/10, Advisor: Dr. Chandrasekhar Annavarapu — *(Aug 2022 – July 2024)*

Central Institute of Technology, Kokrajhar — India
B.Tech., Civil Engineering , CGPA: 8.98/10 — *(Jul 2019 – May 2022*

Central Institute of Technology, Kokrajhar — India
Diploma, Civil Engineering , CGPA: 9.2/10 — *(Jul 2016 – May 2019)*

Research Publications

- **Sarkar, D.R.**, Basu, S., Manuel, L. and Goswami, S., "Uncertainty-Aware Optimization in Engineered Systems via Gradient Boosting and Differential Evolution.". *Proceedings of the 35th European Safety and Reliability & the 33rd Society for Risk Analysis Europe Conference (2025)* - Code Video
- **Sarkar, D.R.**, Kag, V., Pal, B. and Goswami, S., "Learning Hidden Physics and System Parameters with Deep Operator Networks". *arXiv:2412.05133* - Code Video
- **Sarkar, D.R.**, Annavarapu, C. and Roy, P., "Adaptive Interface-Pinns (Adai-Pinns) for Inverse Problems: Determining Material Properties for Heterogeneous Systems". *Finite Elements in Analysis and Design*
- Roy, S., **Sarkar, D.R.**, Annavarapu, C., Roy, P., Lecampion, B. and Valiveti, D., "Adaptive Interface-Pinns (Adai-Pinns) for Transient Diffusion: Applications to Forward and Inverse Problems in Heterogeneous Media". *Finite Elements in Analysis and Design*

Conference and Poster Presentations

- Kag, V., **Sarkar, D.R.**, Pal, B. and Goswami, S., "Learning Hidden Physics and System Parameters with Deep Operator Networks" presented at Engineering Mechanics Institute (EMI) 2025. - Slides
- **Sarkar, D.R.**, and Goswami, S., "Real-Time Inference of Defects and Impedance Using Deep Operator Networks" presented at MACH 2025 conference. - Slides
- Ribeiro, L.F.S., **Sarkar, D.R.**, Roehl, D., and Goswami, S., "Scalable Multi-GPU Training of Neural Operators: Adancing Generalization in High-Dimensional Physical Systems" presented at MACH 2025 conference. - Slides
- Ribeiro, L.F.S., **Sarkar, D.R.**, Roehl, D., and Goswami, S., "Scalable Neural Operator Training for High-Dimensional PDEs" presented at High-Performance Computing Symposium 2025 at JHU. - Poster
- **Sarkar, D.R.**, and Goswami, S., "Accelerating Traumatic Brain Injury Modeling with Neural Operators: Toward Personalized Protective Gear Design" presented at Department of Medicine and Whiting School of Engineering Research Retreat 2025 at JHU. - Poster
- **Sarkar, D.R.**, and Goswami, S., "Pushing the Boundaries of Surrogate Modeling: Neural Operators Integrated Numerical Simulators" presented at SIAM Conference on Computational Science and Engineering (CSE25). - Slides
- **Sarkar, D. R.**, Chanda, A., Annavarapu, C. and Roy, P. (2023), *"On the use of Physics Informed Neural Networks (PINNs) to solve inverse problems in heterogeneous materials"*. presented at the 68^{th} Congress of the Indian Society of Theoretical and Applied Mechanics (ISTAM).

Teaching Service

Teaching Assistant IIT Madras

Aug 2023 – Nov 2023 *Conducted weekly laboratory experiments for "CE 3410: Construction Materials Laboratory"*

Teaching Assistant IIT Madras

Aug 2022 – Nov 2022 *Instructed and supervised weekly laboratory experiments for "CE 2080: Surveying"*

Leadership

Placement Coordinator IIT Madras

June 2023 - May 2024

- Established and maintained strategic partnerships with civil engineering firms, successfully expanding the institute's recruitment network and creating diverse employment opportunities
- Organized and moderated interactive sessions between industry professionals and students, enhancing placement preparedness and career decision-making capabilities

Deputy Placement Coordinator IIT Madras

Aug 2022 - May 2023

- Managed end-to-end recruitment processes at IIT Madras (2022-23), including coordinating with HR teams and securing internship placements for four students across two partner companies

Scholastic Achievements & Awards

- Secured a shared 3rd position in the 2025 **NASA and DNV Challenge on Optimization under Uncertainty.**
- Finalist for the **Whiting School of Engineering Trainee Award** at Johns Hopkins Department of Medicine and Whiting School of Engineering Research Retreat 2025 for abstract titled "Accelerating Traumatic Brain Injury Modeling with Neural Operators: Toward Personalized Protective Gear Design"
- Received **Director's Discretionary allocation award** from Argonne Leadership Computing Facility (ALCF) for project 'Surrogate_LS_DON', granting access to the Polaris supercomputer with 600 node-hours.
- Awarded the **Creel Family Engineering Fellowship** for pursuing Ph.D. (2024-2025) at Johns Hopkins University.
- Awarded the prestigious **TATA Motors Excellence Scholarship** for outstanding academic performance in M.Tech ₹150,000.
- Recipient of All India Council for Technical Education (AICTE) Post Graduate (PG) Scholarship.