Deepanshu

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LinkedIn | Google Scholar | GitHub | Webpage

Professional Summary

- Demonstrated research skills through 10+ publications in domain of data-driven modeling and optimization
- Demonstrated leadership skills, teamwork, and innovative mindset through 2+years of industrial experience

Education

Indian Institute of Technology Madras, Chennai, Tamil Nadu, India
M.S. + Ph.D. in Engineering Design | **CGPA: 9.01/10** Jul 2019–Dec 2024
Thesis Supervisors: Prof. Palaniappan Ramu, IIT Madras, India, &
Prof. Kalyanmoy Deb, Michigan State University, USA

Michigan State University, East Lansing, MI, USA
Exchange Visitor | **International Immersion Experience Program** Sept 2024–Nov 2024

National Institute of Technology Kurukshetra, Haryana, India
B.Tech. in Mechanical Engineering | **CGPA: 9.55/10** Jul 2012–Jun 2016

Work Experience

Vedanta Aluminium Limited, Jharsuguda, India | **Full-time Job**
Graduate Engineer Trainee, Assistant Manager (O&M, Aluminium Smelter) Jun 2016–Aug 2018

Mercedes Benz R&D, Bengaluru, India | **Internship**
Student Intern, Product Design and Development Department, Suspension Team Jun 2015–Aug 2015

Bharat Pumps & Compressors Limited, Allahabad, India | **Industrial Training**
Student Trainee, Industrial visit and inspection of Manufacturing Unit May 2014–Jun 2014

Teaching Experience

- **Teaching Assistant** at Department of Engineering Design, IIT Madras Jul-Nov 2021
  Optimization in Engineering Design (ED6002): **HW and Quiz preparation, Tutorials, Evaluations**
- **Teaching Assistant** at Department of Engineering Design, IIT Madras Jan-May 2022
  Computational methods in Design (ED5015): **HW and Quiz preparation, Tutorials, Evaluations**
- **Teaching Assistant** at Department of Engineering Design, IIT Madras Jan-May 2023
  Computational methods in Design (ED5015): **HW and Quiz preparation, Tutorials, Evaluations**

Journal Publications

1. **Yadav, D.**, Ramu, P., & Deb, K. (2025). **Handling Objective Preferences and Variable Uncertainty in Evolutionary Multi-objective Optimization**. *Swarm and Evolutionary Computation. 94, 101860*
2. **Yadav, D.**, Sekar, K., & Ramu, P. (2024). **Adaptive sampling based estimation of small probability of failure using interpretable Self-Organising Map**. *Structural Safety, 102470.*
3. **Yadav, D.**, Ramu, P., & Deb, K. (2023). **Visualization-aided Multi-criteria Decision-making Using Interpretable Self-organizing Maps (iSOM) Following Pareto Race**. *Applied Soft Computing*.149, 111032.
4. **Yadav, D.**, Nagar, D., Ramu, P., & Deb, K. (2023). **Visualization-aided Multi-criteria Decision-making Using Interpretable Self-organizing Maps**. *European Journal of Operational Research, 309(3), 1183-1200.*

5. Pannerselvam, K., **Yadav, D.**, & Ramu, P. (2022). **Scarce Sample-Based Reliability Estimation and Optimization Using Importance Sampling**. *Mathematical and Computational Applications, 27(6), 99.*

6. Lee, I., Lee, U., Ramu, P., **Yadav, D.**, Bayrak, G., & Acar, E. (2022). **Small Failure Probability: Principles, Progress and Perspectives**. *Structural and Multidisciplinary Optimization, 65(11), 326.*

Conference Proceedings

1. **Yadav, D.**, Ramu, P., & Deb, K. (2025, March). **Reliability-based MCDM Using Objective Preferences Under Variable Uncertainty**. In *Evolutionary Multi-criteria Optimization (EMO), Australia.*

2. **Yadav, D**., Ramu, P., & Deb, K. (2024, July). **An Updated Performance Metric for Preference-Based Evolutionary Multi-Objective Optimization Algorithms**. In *The Genetic and Evolutionary Computation Conference (GECCO 2024).* Association for Computing Machinery (ACM).

3. **Yadav, D**., Ramu, P., & Deb, K. (2023, July). **Multi-objective Robust Optimization and Decision-Making Using Evolutionary Algorithms**. In *The Genetic and Evolutionary Computation Conference (GECCO 2023).* Association for Computing Machinery (ACM).

4. **Yadav, D**., Ramu, P., & Deb, K. (2023, July). **Finding Robust Solutions for Many-Objective Optimization Using NSGA-III**. In *Congress on Evolutionary Computation (CEC 2023). IEEE.*

5. **Yadav, D.**, Ramu, P., & Deb, K. (2022, December). **Visualization-aided Multi-criterion Decision-making Using Reference Direction Based Pareto Race**. In *2022 IEEE Symposium Series on Computational Intelligence (SSCI) (pp. 125-132). IEEE.*

6. **Yadav, D.**, Ramu, P., & Deb, K. (2025). **Machine Learning-Assisted Constraint Handling Under Variable Uncertainty for Preference-Based Multi-Objective Optimization**. In *The Genetic and Evolutionary Computation Conference (GECCO 2025).* Association for Computing Machinery (ACM). **Accepted**

Conference/Symposium Presentations

1. **Yadav, D.**, Ramu, P. & Deb, K. (2023): **Incorporating qualitative preferences in evolutionary multi-criteria decision-making**. In: *The 6th National Conference on Multidisciplinary Design, Analysis and Optimization (NCMDAO 2023) December 6-8, 2023, IIT Guwahati.* **Conference**

2. **Yadav, D.**, Raj, M. & Ramu, P., (2023): **Visualization-aided design space exploration of MDO problems**. In: *The 6th National Conference on Multidisciplinary Design, Analysis and Optimization (NCMDAO 2023) December 6-8, 2023, IIT Guwahati.* **Conference**

3. **Yadav, D.** & Ramu, P. (2023): **Multi-Criteria Decision-making (MCDM) using interpretable Self-organizing Maps (iSOM)**. In: *International System Realization Partnership (ISRP) 2023 Symposium, Design Engineering in the Age of Industry 5.0, Cranfield University.* **Symposium**

4. **Yadav, D.** & Ramu, P. (2023): **A novel sensitivity analysis method using Self Organizing Maps (SOM)**. In: *The 15th World Conference of Structural and Multi-disciplinary Optimization (WCSMO-15).* **Conference**

5. **Yadav, D.** & Ramu, P. (2021): **iSOM enabled targeted sampling for tail modeling**. In: *The 4th National Conference on Multidisciplinary Design, Analysis, and Optimization, IIT Madras.* **Conference**

6. **Yadav, D.** & Ramu, P. (2024): **Handling Objective Preferences and Variable Uncertainty for Evolutionary Multi-objective Optimization**. In: *The 1st International Conference on Multi-disciplinary Design, Analysis, and Optimization, December 14-16, 2024, IISc Bangalore.* **Conference**

7. Rishwanth, M., Kishore, V.V., Srinivasan, A.N., Mani, V., **Yadav, D.** & Ramu, P. (2023): **iSOM-derived explainable outcomes for engineering applications**. In: *The 6th National Conference on Multidisciplinary Design, Analysis and Optimization (NCMDAO 2023) December 6-8, 2023, IIT Guwahati.* **Conference**

8. Kishore, V. V., **Yadav, D**. & Ramu, P. (2024): **Feature Selection and Feature Interaction Using Interpretable Self-Organizing Map**. In: *The 1st International Conference on Multi-disciplinary Design, Analysis, and Optimization, December 14-16, 2024, IISc Bangalore.* **Conference**

9. Khalid, A., **Yadav, D.** & Ramu, P. (2024): **Robust Design Optimization Using Interpretable Self-Organizing Maps**. In: *The 1st International Conference on Multi-disciplinary Design, Analysis, and Optimization, December 14-16, 2024, IISc Bangalore.* **Conference**

Patents

1. Ramu, P. & **Yadav, D.**(2025). **A high-dimensional data visualization method and a device thereof**. *Application No.-202541006906* **Patent Filed**

Course Projects

- **Bayesian Online Change-point Detection** (Course Project, 2021)
- **Text Document Classification Using Self-Organizing-Maps** (Research Project 2021)
- **Application of Markov Chain Monte Carlo Method** (Course Project, 2019)
- **Likelihood Ratios for Out-of-Distribution (OOD) Detection** (Course Project, 2020)

Academic Collaborations

- **COINLab: Computational Optimization and Innovation Laboratory** 2021-current
  Headed by: *Prof. Kalyanmoy Deb, Koenig Endowed Chair Professor, Electrical and Computer Engineering, Michigan State University, USA* (**3 Journal publications, 6 Conference proceedings**)
- **IDO: Innovative Design Optimization Laboratory** 2021-2022
  Headed by: *Prof. Ikjin Lee, Department of Mechanical Engineering, Korea Advanced Institute of Science & Technology (KAIST), Daejeon, South Korea* (**1 Journal publication**)
- **TOBB University of Economics and Technology** 2021-2022
  Headed by: *Prof. Erdem Acar, Department of Mechanical Engineering, TOBB University of Economics and Technology, Ankara, Turkey* (**1 Journal publication**)

Academic and Professional Achievements

- Awarded with **Student Travel Grant** by *Association of Computing Machinery (ACM) to attend GECCO, 2024* 2024
- **Institute Research (IR) Award**, a biannual award by *IIT Madras for Excellence in Research* 2024
- Awarded with **Student Travel Grant** by *Association of Computing Machinery (ACM) to attend GECCO, 2023* 2023
- Awarded with **International Immersion Experience (IIE) Travel Grant** by IIT Madras 2023
- Awarded with **Student Travel Grant** by *IEEE Computational Intelligence Society (CIS) to attend SSCI IEEE, 2022* 2022
- Awarded for securing the overall **highest GPA (10/10)** in a semester (8^{th}), NIT Kurukshetra 2016

Competitions

- **Shell.ai Hackathon for Sustainable and Affordable Energy: EV Charging Network Challenge** 2022
  *- **Goal:** To Optimally locate the EV charging stations based on charging supply information and forecast the demand for the year 2023*
  - Formulated a Mixed Integer Non-liner Programming (MINLP) problem and solved it using MINLP solver
- **Bright Optimizer: International Student Competition in Structural Optimization (ISCSO)** 2021
  *- **Goal:** To optimize the design of a truss structure by minimizing the weight under stress and deflection constraints*
  *- Given **Space Truss Structure was optimized** (∼ 85% of the winner's weight) using mixed integer GA*

Professional Membership

- Member Association for Computing Machinery (ACM) 2024-current
- Reviewer of Journal– Data Science for Transportation, Springer 2024-current
- Reviewer of Journal– Swarm and Evolutionary Computation, Elsevier 2025-current
- IEEE Student Member, Computational Intelligence Society (CIS) 2022-2024