Udit Deo

Ph.D. Student, Computer Science and Engineering, IIT Roorkee
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Research Interests & Summary

Ph.D. student (coursework phase) at the Indian Institute of Technology Roorkee specializing in optimization-driven deep learning for scalable intelligent systems. My research focuses on bridging deep learning and mathematical optimization to design efficient, robust, and interpretable AI models for real-world decision-making.

Education

Indian Institute of Technology Roorkee — Roorkee, UK, India
PhD (Coursework Phase) in Computer Science and Engineering — Jul 2025 - Present

- **Advisor**: Prof. R. Balasubramanian, Machine Vision and Intelligence Lab (MVIL)
- **Research Area**: Optimization and Learning Frameworks for Computer Vision
- **Relevant Coursework**: Essential Mathematics for AI, Concepts of Artificial Intelligence and Machine Learning, Advances in Signal and Image Processing

Maulana Azad National Institute of Technology Bhopal — Bhopal, MP, India
MTech in Software Engineering *GPA: 9.53/10.0* (3.9/4.0 equivalent) — Aug 2023 - Jun 2025

- **Academic Distinction:** Secured **2nd rank** in the M.Tech program; awarded **Merit Certificate** at the 22nd Convocation
- **Thesis:** Bridging Fuzziness and Optimization: Frameworks for Relation Inequalities and Multi-Criteria Decision Systems
  Guides: Prof. MMS Beg (ZHCET, AMU) and Dr. JK Jain (MANIT Bhopal)
- **Relevant Coursework**: Applied Mathematical Analysis, Machine Learning, Neural Networks and its Applications, Deep Learning, Data Science and Analytics, Data Warehousing and Data Mining, Cloud Computing using IoT, Research Methodology

Shri Mata Vaishno Devi University (GFTI under JoSAA; State University) — Reasi, J&K, India
BTech in Computer Science and Engineering *GPA: 8.21/10.0* (3.4/4.0 equivalent) — Jul 2017 - Jun 2021

- Awarded **Tuition Fee Waiver** for securing **2nd rank** in the 7th semester (SGPA: 9.38)
- Exhibited strong academic progression with final two-year SGPA trend: **8.64 → 9.35 → 9.38 → 9.00**

Awards, Fellowships & Examinations

- **UGC–Junior Research Fellowship (JRF), Computer Science & Applications**
  Ranked 15 nationwide (99.95 percentile), Dec 2024
- **Graduate Aptitude Test in Engineering (GATE)**
  Qualified in CS (2025, 2022) and DA (2025)
- **Academic Merit Distinction (M.Tech, MANIT Bhopal)**
  Awarded by MANIT Bhopal for outstanding academic performance
- **Merit Scholarship (B.Tech, SMVDU)**
  Awarded by SMVDU in recognition of academic excellence

Conferences and Publications

Published / Accepted

- Udit Deo, J. K. Jain and M. M. S. Beg, *Robust Client–Server Quality Allocation via Ordered Weighted Averaging: A Multi-Objective Optimization Framework*, Proceedings of the International Conference on Computing, Communication and Networking Technologies (ICCCNT 2025), India, 2025.
- Udit Deo, J. K. Jain and M. M. S. Beg, *A New Approach to Fuzzy Relation Inequalities: Effects of Variable Absence and Weighted Composition*, Proceedings of the International Conference on Artificial Intelligence and its Application (ICAIA 2025), pp. 127–138, doi: 10.1007/978-981-95-0493-0_10, India, 2025.

- Udit Deo, J. K. Jain and M. M. S. Beg, *Advances in Fuzzy Relation Inequalities and Optimization Techniques*, Proceedings of the International Conference on Computational Intelligence, Communication Technology and Networking (CICTN 2025), pp. 833–838, doi: 10.1109/CICTN64563.2025.10932336, India, 2025.

Communicated / Under Review

- Udit Deo, J. K. Jain and M. M. S. Beg, *Multi-Objective Quality Allocation with OWA in Dynamic Server Networks*, SN Computer Science, Under Review, 2025.
- Udit Deo, J. K. Jain and M. M. S. Beg, *CAST: A Novel Cost-Aware Segmentation Tree for Optimized Temporal Quality Analysis of Fuzzy Systems*, Soft Computing, Under Review, 2025.

Research Highlights

- Proposed novel multi-objective optimization frameworks for dynamic client-server quality allocation.
- Developed fuzzy-neural reasoning models for decision systems under uncertainty.

Patent

A Device for Producing Electricity Using Roof Air Ventilator *Apr 2025*
Granted Design Patent (Design No.: 440258-001), IP India, Class 13-01
Inventors: Dr. Anand Kumar, Ayush Kumar Agrawal, Uday Deo, **Udit Deo**, Shashank Kumar Soni, Bikramaditya Chakraborty, Basundhara Singhdeo
Demonstrates interdisciplinary innovation, applying optimization principles to sustainable energy systems.

Professional Experience

Amdocs Development Center Gurugram, HR
Associate Software Engineer Jul 2021 - Jun 2023

- Developed automated **Python tools** for **data synchronization**, reducing manual workload by approximately **90%**
- Designed scalable solutions for **database comparison and merging**, streamlining data consistency across systems

Stackfusion Gurugram, HR
Machine Learning Intern May 2020 - Jul 2020

- Fine-tuned **deep learning models** (MobileNetSSD, ResNet, YOLOv3) via **transfer learning** for vehicle axle and license plate recognition
- Built automated **data preprocessing pipelines** in **Python**, improving dataset quality and diversity for training

Skills & Technical Expertise

- **Core Areas:** Deep Learning, Machine Learning Optimization, Computer Vision, Intelligent Decision Systems, Fuzzy and Soft Computing
- **Research Tools & Frameworks:** PyTorch, TensorFlow, Scikit-learn, OpenCV, MATLAB, NumPy, Pandas
- **Programming & Development:** Python, C++, SQL, Flask, Git, Linux
- **Analytical & Mathematical Tools:** Multi-objective Optimization, Model Interpretability, Statistical Modelling, Linear Algebra
- **Documentation & Presentation:** LaTeX, MS PowerPoint, Research Writing, Technical Visualization