

# UDIT DEO

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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

PhD (Coursework Phase) in Computer Science and Engineering

Roorkee, UK, India

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

MTech in Software Engineering *GPA: 9.53/10.0* (3.9/4.0 equivalent)

Bhopal, MP, India

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 (ZH CET, 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)

BTech in Computer Science and Engineering *GPA: 8.21/10.0* (3.4/4.0 equivalent)

Reasi, J&K, India

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 2025 (CS & DA) with 96.97 percentile and also in 2022 (CS)
- **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