DEBASHIS GUPTA

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EDUCATION

Wake Forest University *Winston-Salem, NC, US*
MS in Computer Science (Thesis Track) Aug 2023 - Aug 2025
Advisor: *V. Paul Pauca, Ph.D*
Thesis: MoSAiC: Multi-Label Classification from Sparse Labels in Multi-Modal Remote Sensing Data.
GPA: 3.834/4.0
Awarded: Full-Ride Scholarship
Awarded: Upsilon Pi Epsilon for Academic Excellence
Awarded: Richter Scholarship for Research Proposal

Rajshahi University of Engineering and Technology (RUET) *Rajshahi, Bangladesh*
BSc in Computer Science & Engineering Feb 2015 - Feb 2021
Advisors: *Biprodip Pal, Ph.D* (Griffith University, Australia)
Thesis: Vulnerability in deep transfer learning models to adversarial fast gradient sign attack for covid-19 prediction from chest radiography images.
GPA: 3.63/4.0
Awarded: Bangladesh Govt. Merit Scholarship for Academic Excellence
Ranked: 4 out of 120 students

RESEARCH EXPERIENCE

Wake Forest University, IRSC Lab *Winston-Salem, NC, US*
RESEARCH ASSISTANTSHIP **Dec 2023 - Aug 2025**
Advisor: Dr. V. Paul Pauca, Dr. Sarra Alqahtani, & Dr. Miles Silman

- Developed **DAS**, an unsupervised domain-agnostic data assessment semantic algorithm to validate factual information **embedded within** a knowledge graph using LLMs, matching **90% accuracy** of domain expert knowledge.
- Developed **MoSAiC**, a multi-label supervised alignment framework leveraging multimodal sensor data (satellite imagery) to detect sub-classes **indistinguishable to the human eye**; the model outperformed state-of-the-art baselines (e.g., CROMA) in macro/micro F1-scores while utilizing significantly fewer parameters.
- Mentored two senior undergraduate students through the full research lifecycle, from problem formulation and coding to proposal submission, resulting in both projects being accepted for the URECA research symposium.

Wake Forest University School of Medicine *Winston-Salem, NC, US*
MACHINE LEARNING INTERN AT CENTER FOR ARTIFICIAL INTELLIGENCE (CAIR) **June 2024 - Aug 2024**
Advisor: Dr. Metin Nafi Gurcan (Director, CAIR) & Dr. Seda Camalan (Research Associate, Mayo Clinic)

- Proposed **OtoSTVT**, a diagnostic-driven frame selection framework designed to prioritize clinically relevant features over visual diversity; this approach outperformed generic summarization baselines by **15%** (F1-score: 0.62) on 42k frames, validating its utility for AI-assisted diagnosis.
- Awarded the **"Best Presentation Award"** among all CAIR summer interns.

TEACHING EXPERIENCE

Wake Forest University *Winston-Salem, NC, US*
TEACHING ASSISTANTSHIP **Aug 2023 - May 2024**
Courses: CSC 101: Problem Solving with Python & CSC 111: Programming Languages

- Collaborated with instructors to design labs, assign homework, and assess student submissions, while resolving honor code issues according to university protocols.
- Designed coding assessments, led review sessions, and offered 1:1 tutoring on core CS topics including substring search and file handling.

Bangladesh Army University Science & Technology (BAUST) *Saidpur, Bangladesh*
Lecturer in Computer Science Department **Nov 2021 - Dec 2022**

- Served as **Program Coordinator**, overseeing curriculum planning and student academic priorities.
- **Co-supervised** multiple undergraduate thesis projects in medical imaging and sentiment analysis.
- **Taught** Machine Learning, Artificial Intelligence, Computer Networks, and C Programming across four semesters.

PUBLICATIONS (CITATIONS: 169+)

Selected Conference & Workshop Papers

- **D Gupta**, A Golder, K Cui, F Yang, S Alaqahtani, and VP Pauca. "MoSAiC: Multi-modal multi-label supervision-aware contrastive learning for remote sensing." (Under Review at **IJCAI-ECAI 2026**)
- **D. Gupta**, R. S. Shefin, S Alaqahtani. "Interpretable Failure Analysis in Multi-Agent Reinforcement Learning Systems" (Under Review at **AAMAS 2026**)
- **D Gupta**, A Golder, S Natarajan and VP Pauca et al. "Scalable knowledge graph construction from unstructured text: A case study on artisanal and small-scale gold mining." *Pacific-Asia Conference on Knowledge Discovery and Data Mining* (**PAKDD**), 2025. [**Oral Presentation**]
- M. A. Rahman, R. S. Shefin, **D. Gupta**, and S. Alqahtani, "Safe, Trust Region Policy Optimization for Constrained Reinforcement Learning", in *NeurIPS 2025 Workshop: Second Workshop on Aligning Reinforcement Learning Experimentalists and Theorists.* [**Poster Presentation**]
- **D Gupta**, KD Gupta, et al. "Security threats on data-driven approaches for luggage screening." *IEEE 14th Annual Computing and Communication Workshop and Conference (CCWC)*, 2024. [**Oral Presentation**]
- **D Gupta**, MA Moni, et al. "Cervixmed: detecting cervical cancer based on combinational data using hybrid architecture." *Int. Conf. on Digital Image Computing: Techniques and Applications (DICTA)*, 2023. [**Oral Presentation**]

Selected Journal Articles

- **D Gupta**[*,Ψ], S. Camalan[*], N. Metin Gurcan et al. "OtoSTVT: A Diagnostic-Driven Frame Selection Method for Otoscopy Videos Using Spatio-Temporal Transformers." (Under Review at **Biomedical Signal Processing and Control Journal**).
- **D Gupta**[*], B. Pal[*], et al. "Vulnerability in deep transfer learning models to adversarial fast gradient sign attack for covid-19 prediction from chest radiography images." *Applied Sciences*, vol. 11, no. 9, 2021.

[*] Authors contributed equally to this work. Ψ During Internship

TECHNICAL SKILLS

Programming	Python, C, C++, MATLAB, JS, Flask, Django
Machine Learning	PyTorch, TensorFlow, Hugging Face, Scikit-learn, OpenCV, NLTK, spaCY
Databases	MySQL, MongoDB, SQLite
Tools & Utilities	G*Power, Github, CodeQL, Bash Scripting, Power BI

ACHIEVEMENTS

- Ranked **1st in Bangladesh** and **3rd in South Asia** in Practical Cryptography exam by BdREN (Bangladesh Research and Education Network) and EU.
- Achieved **14th place** among 100,000+ candidates in national IT exam jointly held by IPA, Japan and Bangladesh Govt.
- Ranked **7th nationally** in Bangladesh Math Olympiad.
- Ranked **94th** among 10,000+ candidates in Coding Competition, CyberNauts, Bangladesh.
- Achieved Honor Award for Hult Prize **Competition**.
- Certified Data Analyst by **IBM**.
- Achieved **Microsoft** Global Certifications in Algorithm and Debugging Challenges.