ADITI GUPTA

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EDUCATION

University of Chicago 4.0/4.0
MS, Statistics *Sep 2024 – Dec 2025*

- Statistical Consulting, Machine Learning for graphs, groups, and manifolds, Topics in Deep Learning - Generative Models, Topics in Representation Learning, Applied Stochastic Processes
- **Research interests**: Generative AI, Diffusion Models, Multimodal LLMs, Uncertainty Quantification

Indian Institute of Technology, Delhi 8.7/10.0
B.Tech., Mechanical Engineering *Aug 2020 – May 2024*

- Optimization and Online Prediction, Advanced Operations Research, Numerical Methods and Computation, Special Topics in Computers, Robotics Technology

INTERNSHIPS

Research Intern | Lawrence Berkeley National Lab, Computing Sciences [May, 2025 - Present]

. Collaborating with **Prof. N. Benjamin Erichson's Robust Deep Learning** group on trustworthy GenAI models
. Designing DDPM-based emulators and pipelines to quantify uncertainty to detect anomalies, and improve robustness
. **Organizing team, DL4Sci Summer School** - Coordinated speakers and tutorials for a week-long international deep learning event

Research Assistant | Prof. Mihai Anitescu, University of Chicago [Jan, 2025 - Present]

. Investigating **Gaussian Processes** for scalable sampling and covariance estimation in large-scale data modeling
. Developing efficient sparse factorization techniques to optimize covariance estimation for **high-dimensional** datasets

Data Science Intern | Massachusetts Institute of Technology [June, 2024 - Aug, 2024]

. Worked with **Prof. David Simchi-Levi** on hybrid models combining visual embeddings and textual data, improving sales predictions for new fashion products,
. Engineered multimodal predictive models to identify emerging shifts and anomalies in consumer demand, enhancing early detection of risks in forecasting

PROJECT EXPERIENCE

Epistemic Uncertainty in Language Models | Research Project ***Prof. Victor Veitch***
Mechanistic Interpretability [Mar 2025 – June 2025]

. Investigated whether internal representations of LLMs encode signals of epistemic uncertainty using layerwise probes
. Trained MLP predictors on entropy-based metrics from Pythia-1.4B and Pythia-7B models over corpus datasets
. Demonstrated predictive alignment between probe outputs and hallucination likelihood, highlighting interpretability and robustness potential

Uncertainty Quantification with Conformalized GNNs | Research Project ***Prof. Risi Kondor***
Generative Modelling [Jan, 2025 - April, 2025]

. Built a conformal prediction framework to improve reliability and quantify uncertainty in GNN-based link prediction
. Evaluated the approach on OpenGraph benchmark datasets, improving AUC-ROC by 7.5% and reducing uncertainty estimation error by 23%, demonstrating superior calibration over existing baselines.

TECHNICAL SKILLS

Languages/Libs: Python, ROS, Gazebo, SQL, Java, R, NumPy, PyTorch, Keras, TensorFlow, Pandas, Git, C++, Scikit-learn, CUDA, Bash, Linux, Jupyter, AWS

SCHOLASTIC ACHIEVEMENTS

. **GRE Score**: Quantitative Reasoning - 169; Verbal Reasoning - 162 [2023]
. **Department Rank & Mittal Scholar**: Consistently ranked among top 10 students in the dept. [2020-2023]
. **KVPY & NTSE Scholar**: Issued by Govt. of India and IISc, Bangalore to the top 1% candidates [2019, 2018]
. **Mathematics Olympiad**: Qualified RMO and selected among top 10 students [2018, 2017]