Shagun Gupta

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Operations Research and Industrial Engineering 3rd year PhD student from University of Texas at Austin specializing in **designing algorithms for nonlinear optimization**. Proficient in Python and MATLAB.

EDUCATION

- **University of Texas at Austin** *Aug 2020 - May 2025*
  PhD in Operations Research and Industrial Engineering, GPA: 4.0/4.0

- **Indian Institute of Technology Delhi** *Jul 2016 - May 2020*
  B.Tech in Production and Industrial Engineering, GPA: 9.067/10

RESEARCH PROJECTS

- **Contrained Stochastic Optimization** *Sep 2022 - Present*
  Prof. Raghu Bollapragada at University of Texas, Austin
  - Designing algorithms for **stochastic constrained optimization** with minimal sampling costs
  - Analysing convergence of **2nd order methods** in stochastic settings under various statistical approximations

- **Distributed Optimization over Networks** *Jan 2022 - Present*
  Prof. Raghu Bollapragada at University of Texas, Austin
  - Designing **flexible algorithms** to accomodate differences in compuation and communication costs across systems
  - Analysing effect of graph connectivity on convergence of existing **gradient tracking algorithms**
  - Designing algorithms that can converge with **minimal communication** using additional computational load

- **Extreme Weather Electric Grid Resilience** *Apr 2021 - Sep 2021*
  Prof. Erhan Kutanoglu and Prof. John Hasenbein at University of Texas, Austin
  - Analysed preparedness decisions for substation flood mitigation under **stochastic and robust optimization**
  - Performed case studies for hurricanes Harvey and Imelda under different methods of mitigation
  - Displayed **discontinuity and unfairness** in standard load loss minimization objective decisions

- **Reducing Delays in Supreme Court of India** *Jul 2019 - Jul 2020*
  Prof. Ramandeep Randhawa at USC and Prof. Nitin Bakshi at The University of Utah
  - Developed a simulation of the Supreme Court of India and **quantified effects of remedial policies** for delays
  - Designed **queuing network and decision tree** for daily scheduling and processing of cases

PUBLICATIONS

- B. Austgen, **S. Gupta**, E. Kutanoglu, J. Hasenbein, Stochastic Hurricane Flood Mitigation for Power Grid Resilience, *Best Paper Session*, 2022 IEEE Power and Energy Society General Meeting (PESGM)
- R. Moglen, J. Barth, **S. Gupta**, E. Kawai, K. Klise, B. Leibowicz, "A Nexus Approach to Infrastructure Resilience Planning under Uncertainty," Reliability Engineering and System Safety

WORK EXPERIENCE

- **MD Anderson Cancer Center** *Jan 2022 - May 2022*
  Graduate Student Intern in Department of Financial Planning and Analysis
  - Analysed schedules for clinical physicians at MD Anderson to **improve provider time utilisation**
  - Built simulation to quantify effects of counterfactual changes in schedules of clinical physicians
  - Provided global policies for schedule improvements combining insights from various counterfactuals

- **NTU India Connect Scholarship : Data Interface for Smart Manufacturing** *May 2019 - Jul 2019*
  Prof. Yeo Swee Hock at Nanyang Technological University, Singapore
  - Designed systems for data collection and virtualisation to enable Smart Machining features in a traditional CNC lathe machine using sensors like dynamometer, acoustic emission sensor and inline measurement systems.
  - Set up an **OPC UA server** and a **GUI** to collect and monitor sensor data in real-time

TECHNICAL SKILLS AND COURSEWORK

- Experience programming in Python, R and MATLAB
- Advanced courses in Optimization (Linear, Nonlinear, Stochastic), Machine Learning and Statistics
- Proficient in numerical optimization and system modeling