Shagun Gupta

shagungupta@utexas.edu | shagun-g.github.io

4th year PhD student from University of Texas at Austin, Operations Research and Industrial Engineering, specializing in **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

PUBLICATIONS

- A. Berahas, R. Bollapragada, **S. Gupta**, "Balancing Communications and Computations in Gradient Tracking Algorithms," 2023, Under Review, https://arxiv.org/pdf/2303.14289
- 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, 2023
- 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)

WORK EXPERIENCE

- **Argonne National Lab : MCS Givens Associate** *Jun 2023 - Aug 2023*
  Supervised by Jeffery Larson and Matt Menickelly
  - Designed a **noisy derivative free optimization** solver to determine quantum computing parameters.
  - Aimed to **improve efficiency** of quantum approximation algorithms for combinatorial problems.
  - Achieved **upto 30% reduction** in operating cost to acheive desired accuracy in simulations.
- **MD Anderson Cancer Center** *Jan 2022 - May 2022*
  Graduate Student Intern in Department of Financial Planning and Analysis
  - Built simulations for analyzing clinic schedules to **improve provider time utilization**.
  - Provided statitical evidence of reduced wait times for patients under the suggested policies.
- **NTU India Connect Scholarship : Data Interface for Smart Manufacturing** *May 2019 - Jul 2019*
  Prof. Yeo Swee Hock at Nanyang Technological University, Singapore
  - Designed a data collection system to enable smart machining features in a traditional CNC lathe machine.

RESEARCH PROJECTS

- **Restrospective Approximation : Tuning Free Contrained Stochastic Optimization** *Aug 2023 - Present*
  Prof. Raghu Bollapragada at University of Texas, Austin
  - Designing a framework for **stochastic constrained optimization** using tuning free deterministic solvers.
- **Tuning Free SVRG Optimization Algorithm** *March 2023 - Present*
  Prof. Raghu Bollapragada at University of Texas, Austin
  - Designing policies for **adaptive selection** of hyperparameters in the SVRG optimizaton algorithm.
  - Illustrated **close to tuned parameter performance** over initial phases of the optimization procedure.
- **Decentralized Optimization over Networks** *Jan 2022 - Mar 2023*
  Prof. Raghu Bollapragada at University of Texas, Austin
  - Designed an algorithmic framework for varied computation and communication costs in decentralized systems.
  - Analysed **theoretical convergence** and effects of system properties such as network connectivity.
  - Provided theoretical and empirical **evidence** of the algorithm **adapting to various cost** structures.
- **Extreme Weather Electric Grid Resilience** *Apr 2021 - Sep 2021*
  Prof. Erhan Kutanoglu and Prof. John Hasenbein at University of Texas, Austin
  - Analysed electric grid preparedness decisions for flooding mitigation during extreme weather events.
  - Performed case studies for hurricane Harvey and Imelda under **stochastic and robust decision paradigms**.
  - Displayed **discontinuity and unfairness in decisions** from standard load loss minimization objective models.

TECHNICAL SKILLS

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