Preetam Kulkarni

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Objective

Experienced researcher with a strong foundation in operations research, statistics, and machine learning. Seeking a challenging role as a Data Scientist or Applied Scientist to leverage research experience in simulation, predictive modeling, optimization, and advanced analytics to enable data-driven decision-making and innovative solutions in a dynamic organization.

Education

University of Texas at Arlington, Arlington, TX — *Aug 2021 – May 2025*
Doctor of Philosophy in Industrial Engineering, *GPA – 4*
Honors: *Lawrence W. Stephens Fellowship*

Iowa State University, Ames, IA — *Aug 2016 – Aug 2018*
Master of Science in Industrial Engineering, *GPA – 3.91*

Bangalore University, Bengaluru, India — *Sep 2009 – Jul 2013*
Bachelor of Engineering in Mechanical Engineering, 82.1%

Relevant Coursework

- Probability & Statistics, Applied Regression Analysis, Design of Experiments, Data Mining & Analytics, Stochastic Processes
- Operations Research, Computational Optimization, Response Surface Methodology & Computer Experiments
- Linear & Nonlinear Programming, Simulation and Optimization, Systems Engineering, Advanced Engineering Economy

Skills

- **Data Analysis**: Python, Pandas, NumPy, Matplotlib, Seaborn, SAS, MATLAB, SQL, PySpark, Tableau, Excel, Power BI
- **Statistical Analysis**: Regression Analysis, Design of Experiments, Hypothesis Testing, Response Surface Methodology
- **Machine Learning**: scikit-learn, TensorFlow, PyTorch, CatBoost, XGBoost, Transformers, Deep Learning, CNN, RNN
- **Simulation**: Agent-Based Modeling (ABM), Discrete-Event Simulation, NetLogo, MESA, WITNESS, AnyLogic and Simio
- **Risk Management**: Failure Modes and Effects Analysis (FMEA), Root Cause Analysis (RCA), 3 Legged 5 Why (3L5Y) and 8D
- **Others**: HTML, CSS, Google AppSheet, GitHub, AWS

Projects

- Fine-tuned **BERT for sequence classification** to predict disaster tweets, with data preprocessing and model optimization - GitHub
- Developed **sales forecasting** models using **multivariate linear regression**, **deep neural networks**, and **XGBoost**, incorporating trend, seasonality, and promotional features across 54 stores and 33 product families - GitHub
- Conducted data preprocessing, model training & selection to **predict the trip purpose of airline passengers** using **CatBoost**, **Logistic Regression** and **Stochastic Gradient Descent** based on a data set with 364,811 instances and 58 features
- Used **multiple linear regression** to predict heart-rate of a user based on gym equipment settings and user characteristics - GitHub
- Developed a state transition matrix from historical data and **simulated future stock price variation** in Python - GitHub
- Developed and analyzed a **discrete-event simulation** of a silicon wafer production facility to generate a monthly investment plan to efficiently increase the facility's production capacity over a year - GitHub
- Conducted a **Design of Experiments (DOE)** study to evaluate the effects of infill percentage (density) and print speed on the tensile strength of 3D-printed poly lactic acid (PLA) components - GitHub
- Applied **Response Surface Methodology (RSM)** to identify the optimum temperature of water, stirring rate and amount of water that would minimize the time taken to dissolve a fixed amount of salt - GitHub

Work Experience

Graduate Research Assistant, University of Texas at Arlington – Arlington, TX — *Sep 2021 – May 2025*

- Implemented sequential sampling to generate a Random Forest and XGBoost metamodel of an ABM of a crowd logistics network
- Developed a participatory ABM using Python's Tornado and MESA packages, incorporating real-time user interaction capabilities
- Deployed a participatory ABM on AWS EC2 using cloud9, enabling participants to access the simulation interface remotely
- Performed sentiment analysis using NLP with a transformer model on student feedback from a simulation experiment - GitHub
- Mentored and collaborated with graduate students in developing participatory ABMs on GitHub

- Created a prototype of a crowd logistics mobile app using Google AppSheet to help farmers transport their produce
- Developed an ABM of a centralized and decentralized crowd logistics network using Python and NetLogo - GitHub

Quality Engineer, John Deere - Hagie – Clarion, IA *May 2018 – Jul 2021*

- Developed interactive dashboard in Excel for visualizing and analyzing machine failures at assembly stations
- Performed critical supplier risk assessment based on failures per machine, quality and delivery ppm and conducted supplier audits
- Facilitated Failure Modes and Effects Analysis (FMEA) and conducted root cause analysis using 3L5Y to address quality issues

Quality Engineer Co-op, Whirlpool – Amana, IA *Jun 2017 – Jan 2018*

- Created process maps and analyzed quality defects to develop quality control plans
- Designed experiments to study and modify processes which reduced annual service incident rate by ~0.3%
- Won "Whirlpool Bravo" award for development and implementation of Door Value Stream Quality System

Graduate Research Assistant, Iowa State University – Ames, IA *Jan 2017 – May 2017*

- Developed stochastic & deterministic optimization models for production and inventory control in MATLAB

Process Engineer, Tata Technologies Limited – Pune, India / Solihull, United Kingdom *Mar 2014 – Jul 2016*

- Analyzed and improved data consistency by 40% in GSPAS – assembly process management tool that uses standard language
- Reviewed and eliminated Non-Value-Added (NVA) operations in GSPAS resulting in a 30% reduction in cycle time allocation
- Delivered knowledge transfer sessions on DELMIA V5 and GSPAS to a group of 10 employees in four sessions

Certifications

- **DeepLearning.AI** - Generative AI with Large Language Models (LLM), Deep Learning, Machine Learning in Production
- **Udemy** - Big Data with Apache Spark and Python, Microsoft Power BI, Tableau, SQL Bootcamp
- **Kaggle** - Time Series (Forecasting)
- **DataCamp** - Supervised Learning with scikit-learn

Publications

- Krejci, C., Kulkarni, P., Paliwal, A., & Boardman, B. (2024). Using Participatory Agent-Based Modeling to Teach Systems Thinking for Inventory Control. In *IISE Annual Conference. Proceedings* (pp. 1-6). Institute of Industrial and Systems Engineers (IISE).
- Kulkarni, P., & Krejci, C. C. (2023, December). Matchmaking In Crowd-Shipping Platforms: The Effects Of Mediator Control. In *2023 Winter Simulation Conference (WSC)* (pp. 303-314). IEEE.
- Kulkarni, P., Patel, P., & Krejci, C. (2023). Designing a collaborative online transportation platform for sustainable regional food distribution. In *IIE Annual Conference. Proceedings* (pp. 1-6). Institute of Industrial and Systems Engineers (IISE).
- Kulkarni, P., & Krejci, C. (2022, October). Evaluating a Crowd Logistics Network Using Agent-Based Modeling. In *Conference of the Computational Social Science Society of the Americas* (pp. 21-34). Cham: Springer International Publishing.
- Kulkarni, P., Azizi, V., Wang, L., & Hu, G. (2021). Analysis of decision making and information sharing strategies in a two-echelon supply chain. *International Journal of Supply Chain and Inventory Management*, *4*(1), 81-106.
- Mehr, M. N., Kulkarni, P., Wang, L., & Hu, G. (2017). Production Planning of a Three-echelon Supply Chain with Information Sharing. In *IIE Annual Conference. Proceedings* (pp. 1823-1828). Institute of Industrial and Systems Engineers (IISE).
- Kulkarni, P. (2015). Evaluation of mechanical properties of AL 2024 based hybrid metal composites. *IOSR Journal of Mechanical and Civil Engineering (IOSR JMCE)*, 2278-1684.