Saviz Saei, Ph.D.
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U.S. Permanent Resident

Profile

5+ years of experience in Optimization, machine learning, and statistical modeling. Proficient in Operation Research Modeling, Python, Gurobi, TensorFlow, with extensive experience deploying ML models in cloud environments, Azure. Proven ability to lead interdisciplinary teams and drive impactful solutions. U.S. Permanent Resident.

Skills

Programming/ Tools: Gurobi, Python, R Studio, PyTorch, TensorFlow, SQL, Java Script, React.

Machine Learning Libraries: Optimization on Transportation, Two-Stage Stochastic Programming with Risk-Neutral, Risk-Averse, and Hybrid Approaches, Supervised/Unsupervised Learning, Reinforcement Learning, Gradient-Base Optimization, Statistical Analysis, Time Series Analysis.

Cloud Computing: Azure Cloud, cloud deployment, APIs, Docker, Git, PowerBI.

Education

- *Ph.D. in Industrial and Systems Engineering*
  Mississippi State University, Starkville, MS, United States Jul 2021 – Dec 2024
  Dissertation: On the Nexus of Topological Measures and Their Ability to Elucidate Network Vulnerability Patterns.
  Advisor: Dr. Nazanin Tajik
  Relevant courses: Stochastic Programming, Optimization, Machine Learning with PySpark, Deep Learning, Advanced Data Analysis, Time Series.
- *Minor in Computer Science*
  Advisor: Dr. Max Young
  Relevant courses: Machine Learning, Artificial intelligence with Python, Introduction to Algorithms, Data Science with R, Data Structures with C++.
- *M.S. in Industrial Engineering*
  Science & Research Branch Azad University, Tehran, Iran Sep 2010 – Jan 2013
  Dissertation: A New Mathematical Model for a Multi-Depot Vehicle Routing Problem in a Natural Disaster
  Situation and Its Solution Using a Particle Swarm Optimization Algorithm.
  Advisor: Dr. Reza Tavakoli-Moghadam
  Relevant courses: Simulation of freight transport, System analysis of air pollution.
- *B.S. in Statistics*
  Imam Khomeini International University, Qazvin, Iran Sep 2004 – Oct 2008

Publications

Resilience in Transportation Network:

- Saei, S., Ghimire, S., & Anreddy, S. (2025). "Beyond Accuracy: Evaluating LLMs for Validating Community Service Provider." SEDE-2025 Springer Nature.
- Saviz, S., & Anreddy, S. (2025). "A Comparative Analysis of RAG and Non-RAG Models to Improve Access to Service Provider Information for Older Adults in Mississippi", SEDE-2025 Springer Nature.
- Saei, S. (2025). Scenario-Based Optimization of Network Resilience: Integrating Vulnerability Assessments and Traffic Flow. arXiv:2503.23251.
- Saei, S., & Tajik, N. (2024). "Risk-Neutral, Risk-Averse, and Hybrid Approaches for Scenario-Based Two-Stage Stochastic Programming in Disrupted Transportation Networks." Presented at the 2024 Annual INFORMS Conference page 1151/1276.
- Saei, S., & Tajik, N. (2022). "Time-Dependent Restoration Routing Problem: An Efficient Initial Solution." Findings.
- Saei, S., Mohammadi, M., Fekriseri, M., & Jenab K. (2019). "A computational method for estimating Burr XII parameters with complete and multiple censored data", arXiv:1901.09299
- Saei, S., Tavakoli-Moghaddam, R., & Alinaghian, M. (2013). "A New Mathematical Model for a Multi-Depot Vehicle Routing Problem in a Natural Disaster Situation and Its Solution Using a Particle Swarm Optimization Algorithm." Journal of Transportation Research, 12(142), 37-51.

Machine Learning:

- Saei, S., Wang, Y., Marufuzzaman, M., Tajik, N., & Wang, H. (2022). "Prediction of Community

Transmission Levels of COVID-19 Using Machine Learning Algorithms Based on the CDC Social Vulnerability Index." Biomedical Sciences Instrumentation, 58(3), 9. International Academic Express (IAE).

- Pirim, H., Rahman, Z., Saei, S., Gyawali, S., Marufuzzaman, M., Tajik, N., & Tekedar, H. C. (2025). Machine Learning and Network Analysis to Predict Hypothetical Protein Functions of Aeromonas hydrophila. *bioRxiv*, 2025-07.

Under Review:

- Saei, S., Barker, K., Tajik, N., & Ermagun, A. (2024). "On the Nexus of Topological Measures and Their Ability to Elucidate Network Vulnerability Patterns." Under review in Journal of Reliability Engineering and System Safety.

Review and Professional Associations:

- Journal of Plus One 2022 - 2023
- Member of INFORMS, IISE 2022-Present

Experience

Research Scientist | Social Science Research Center Apr 2025 – Present

- Conduct statistical analyses (t-tests, chi-square, Mann-Whitney U, regression modeling) on healthcare access and eHEALS survey data using Python, R, and SPSS.
- Designed AI RAG model and service-matching agent with LLaMA & OpenAI for healthcare, housing, and legal aid.

Archer Daniels Midland (ADM) | Machine Learning Engineer Apr 2024 – Feb 2025

- Re-architected SAP-generated reports with Azure, Python, FastAPI, and React; integrated Faiss vector DB and APIM, reducing costs by 30%.
- Designed GenAI Q&A RAG system with embedding-based retrieval to improve accessibility.
- Built HR recommendation engine using Azure embeddings for candidate-job matching.

Social Science Research Center | Research Scientist/Intern May 2023 – Aug 2023

- Analyzed social media data for an NSF-funded research project; utilized Pandas, NumPy, and NLP techniques (NLTK, NRCLex, regex) to assess mental health trends during critical events such as COVID-19.
- Developed interactive data visualizations using JavaScript and Matplotlib; transformed complex research findings into clear, insightful visuals to enhance data interpretation and communication.

Mississippi State University | Research Assistant Jun 2021 – Apr 2024

- Conducted an in-depth study on infrastructure system resilience; analyzed disaster resilience across engineering, ecology, and social sciences to identify key vulnerabilities and improve mitigation strategies.
- Developed strategic board game AI using machine learning and neural networks; integrated A search and deep reinforcement learning to enhance decision-making and optimize gameplay performance.
- Independently researched deep reinforcement learning techniques; explored policy gradients, Q-learning, and actor-critic methods to advance AI decision-making and optimize learning efficiency.

Ohio University | Research Assistant and Teaching Assistant Jan 2021 – May 2021

- Conducted regression analysis and data preprocessing using Python and SQL in collaboration with IBM, optimizing data quality and modeling to enhance predictive insights into human trafficking patterns.
- Served as a Teaching Assistant for a core business analytics course covering SQL, Microsoft Access, and Excel for Data Analysis. Provided hands-on support in lab sessions, and guided students through real-world database and spreadsheet applications essential for business decision-making.

Golrang System Company- IT | Project Mng & Data Scientist Jul 2017 – Nov 2020

- Managed multiple projects using Azure DevOps; task management, and team collaboration to improve project efficiency and delivery.
- Optimized sale process performance using SQL, PoweBI, and Azure to increase sales by 15%.

Certificates

- Python 3 Programming Specialization – University of Michigan (Coursera)
- Azure AI Fundamentals (AI-900) – Microsoft
- Supervised Machine Learning: Regression and Classification – Stanford University (Coursera)
- Neural Networks and Deep Learning – DeepLearning.AI (Coursera)
- SQL Server Design and Implementation – Fad.ir