Saba Ghasemi Naraghi

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⌨ LinkedIn Profile

Education

2022-Present	**PhD, Oklahoma State University**, *Chemical Engineering,* GPA: 4/4.
2019-2021	**M.Sc, Amirkabir University of Technology**, *Optimization,* GPA: 4/4.
2018-2021	**B.Sc, Amirkabir University of Technology**, *Industrial Engineering,* GPA: 3.76/4.
2015-2019	**B.Sc, Amirkabir University of Technology**, *Applied Mathematics,* GPA: 3.65/4.

Work Experience

2022-Present   **Graduate Research Assistant**, Oklahoma State University, Stillwater, USA.

- Mathematical Modelling: Develop a scenario-based multi-objective stochastic mixed-integer nonlinear programming formulation for the global supply chain of glyphosate to minimize the manufacturing and logistic costs, virtual water consumption, and lost sales risk.
- Risk Management: VaR (Value-at-Risk) and CVaR (Conditional Value-at-Risk) were applied to model demand uncertainties.
- Reformulation & Solution: Perspective reformulation technique is introduced to linearize the MINLP formulation for an agrochemical supply chain optimization for the first time. Gurobi, SCIP, BARON, and HiGHS are used to solve both formulations. The reformulated model solved significantly faster than the original one.

2019-2021   **Graduate Research Assistant**, Amirkabir University of Technology, Tehran, Iran.

- Perspective function and perspective cuts were implemented to several MINLPs with quadratic, exponential, and absolute value objective functions, with applications in portfolio selection, index tracking, and logistic growth of bacteria. compared with classic linearization methods such as McCormick relaxation, perspective reformulation gave a tighter approximation. The reformulated model solved significantly faster.

2020-2021   **Portfolio and Financial Analyst**, Nikan Abresan Arya, Tehran, Iran.

- Formulated real-world stock portfolio selection problems as a mixed-integer quadratic program to minimize investment risks. Monte Carlo simulation was used to approximate the probability distribution of different scenarios. Under most portfolio sizes and scenarios, the perspective cuts technique led to tighter approximation and faster convergence compared to other linearization techniques.

2019-2020   **Operations Research Analyst**, Iran's National Elites Foundation, Tehran, Iran.

- Mathematical Modelling & Simulation: Proposed a bi-level multi-objective mixed-integer programming model to optimize the production plan and manufacturing process of ultrasonic filters for water purification.

Selected Projects

2020-2021   **Choices of Socially Responsible Investment Indices in Portfolio Optimization**, Amirkabir University of Technology.

- The portfolio selection behaviour subject to social responsibility and its impact on the risk and profitability of portfolios consisting of ethical and immoral investment opportunities were examined.
- The models were solved using real data taken from selected stocks from the Tehran Stock Exchange. Based on moral and personality characteristics (e.g., risk aversion and investor goals) a unique customized portfolio can be obtained for each real and legal person.

May 2020	**Operating Room Scheduling Problem Under Uncertainty**, Amirkabir University of Technology.

- A bi-level multi-objective stochastic model was developed to optimize scheduling hospital operating rooms. The real schedule data from a hospital were used to solve the model for weekly scheduling.

Publication

2022	**Stochastic Optimization of Global Agrochemical Supply Chain with Risk Management: Modelling and Reformulation**, Submitted for 33rd European Symposium on Computer-Aided Process Engineering, Athen-Greece, 2022.

Technical Skills

Language	C, Python, Julia
Tools	GAMS, MATLAB, Spyder, Jupyter Notebook, Gurobi, SPSS, LATEX, Microsoft Office

Honors & Rewards

2021	Top 5% students among M.Sc students of optimization
2019-2021	Government tuition-fee scholarship for M.Sc degree
2019	Top 5% students among B.Sc students of applied mathematics
Since 2019	Member of Iran's National Elites Foundation
Since 2017	Member of Amirkabir University of Technology Honors and Olympiads Foundation

Volunteer Experience

2022-Present	Secretory of Iranian Students Association at Oklahoma State University

References

Dr. Zheyu Jiang, Oklahoma State University.
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Dr. Jindal Shah, Oklahoma State University.
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Dr. Ozgur Capraz, Oklahoma State University.
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