Elahe Mohammadi Siahroodi

🏠 2701 Hatfield, PA, USA, 19440
📞 +1 (484) 896-8935

✉ elahemohammadi.sr@gmail.com
🖥 elahe-mohammadi.com
⊙ github.com/elahemohammadi
in linkedin.com/in/elahe-mohammadi-siahroodi

Fields of Interest: *Mathematical Optimization, Machine Learning, Numerical Analysis, Algorithm Design*

Education

- **M.Sc., Systems Engineering**, Johns Hopkins University *2022 – 2024*
  Explored the Challenges of Uncertainty Associated with Data-driven Inverse Optimization

- **M.Sc., Applied Mathematics**, Sharif University of Technology *2018 – 2021*
  Applications of Quadratic Programming in Bio-informatics Problems Specially Network Alignment; Supervised by Dr. Mohammad Hadi Foroughmand Arabi

- **B.Sc., Pure Mathematics**, Sharif University of Technology *2013 – 2018*
  Stochastic Process in Financial Pricing Models; Supervised by Prof. Bijan Zohouri Zanganeh

Research Experience

- **Speed up Neural Network Parameters Optimization** *2024 – Present*
  Johns Hopkins University
  Developed a first-order optimization method with second-order convergence rates using a Jacobi Preconditioner, outperforming current algorithms like ADAM.

- **Robust Optimization Approach for Online Learning** *2024 – Present*
  Johns Hopkins University
  Applied distributionally robust optimization to enhance inverse reinforcement learning models.

- **Study of Uncertainty in Inverse Optimization** *2022-2024*
  Johns Hopkins University
  Employing methods like stochastic programming and robust optimization to enhance decision-making. Applied advanced statistical techniques and machine learning to improve model accuracy and robustness, with applications in radiotherapy

- **Drug Adverse Effect Forecasting Based on Protein Targets** *2022*
  Johns Hopkins University
  Predicted adverse drug effects by analyzing protein-target similarities using machine learning and graph measures.

- **Network Alignment in Protein Interactions (M.S. Thesis)** *2020 – 2021*
  Sharif University of Technology
  Developed a stochastic dual primal mirror descent algorithm for efficient network alignment in protein-protein interactions.

- **Genome Scale Reconstruction of Metabolic Pathways in Cancer** *2020 – 2021*
  Sharif University of Technology
  Spearheaded the theoretical framework and algorithm design for modeling cancer cell metabolic networks, identifying crucial pathways. Developed spectral algorithms in Python and Matlab for efficient community detection, uncovering vital biological communities. Designed and evaluated machine learning models to forecast the effects of metabolic pathways on cancer progression, enhancing understanding of cancer metabolism.

Teaching Experience

- **Teaching Assistant**, *Johns Hopkins University* *2024*
  Computational Statistics, Introduction to Optimization

- **Teaching Assistant**, *Sharif University of Technology* *2020 – 2021*
  Operational Research I

- **Mathematics Tutor** *2015 – 2021*
  Tutored Students at Middle School, High School, and Undergraduate Level in a Variety of Subjects.

Certifications

- **IBM Data Science Professional Certificate** *IBM*
  Tools, Languages, and Libraries for Data Analytics, including Python and SQL
  Import and Clean data sets, Analyze and Visualize data
  Build Machine Learning Models and Pipelines

- **Deep Learning Specialization** *DeepLearning.AI*
  Neural Networks, Deep Learning, Convolutional Neural Network, Sequential Models

Technical Skills

Programming: Python, MATLAB, R, HTML
ML & Data Science: PyTorch, TensorFlow, Scikit-Learn, SQL
Optimization: CVX, Gurobi, COBRA, PuLP
Others: LaTeX, Microsoft Office, CAD

Major Courses

Optimization and Numerical Analysis: Operational Research 1 and 2, Numerical Analysis 1 and 2, Convex Optimization, Advanced Numerical Analysis, Advanced Nonlinear Optimization (audited), Optimization Methods in Metabolic Networks (audited), Matrix Computations, Optimization in Data Science
Data Science and Machine Learning: Machine Learning 1 and 2, Artificial Intelligence, Data Science, Regression, Advance Topics in Machine Learning (Bandits, Reinforcement Learning, Online Learning)
Statistic and Probability: Probability and Applications, Statistic and Applications, Stochastic Processes, Theory of Probability (audited)
Others: Mathematical Analysis 1 and 2, Linear Algebra, Complex Analysis, Advanced Linear Algebra, Real Analysis, Network Algorithms and Modeling

Honors

- Fellowship, *Johns Hopkins University*

- Ranked in top 1 percent of national entrance exam of universities

- Ranked in 36th (out of 10 thousand) of national entrance exam of universities for masters

Languages

English, Persian, Azerbaijani

Hobbies

Gardening, Cooking and Baking, Reading (fictional and non-fictional)

References

- **Dr. James Guest** - Professor and Department Head, Civil and Systems Engineering, Johns Hopkins University - `jkguest@jhu.edu`

- **Dr. James Schmidt** - Research Assistant Professor, Applied Physics Laboratory, Johns Hopkins University - `aschmi40@jhu.edu`

- **Dr. Kimia Ghobadi** - Assistant Professor, Civil and Systems Engineering, Johns Hopkins University - `kimia@jhu.edu`

- **Dr. Mohammad Hadi Foroughmand** - Assistant Professor, Mathematical Science, Sharif University of Technology - `foroughmand@sharif.ir`

- **Dr. Mojtaba Tefagh** - Assistant Professor, Mathematical Science, Sharif University of Technology - `mtefagh@sharif.ir`