

Kamiar Asgari

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General Information

- **Full Name:** Kamiar Asgari
- **Nickname:** Kamy
- **Languages:** Persian (Farsi) - Native, English - Fluent (Second Language)
- **Summary:** Kamiar Asgari, a highly skilled individual with a Bachelor's in Electrical Engineering from Sharif University, Iran's top engineering school, completed the program in four years before embarking on a Ph.D. at USC. Specializing in convex optimization algorithms during the Ph.D., Kamiar has developed a deep understanding of convex analysis and machine learning algorithms. With a solid foundation in applied probability, statistics, and mathematics, they possess a robust suite of computer skills, including Python, LaTeX, Linux, and Git. Eager to continue research, preferably in an industrial setting, Kamiar looks forward to applying their extensive knowledge and skills post-Ph.D.

Education

- **Ph.D.**

- **Institution:** University of Southern California (USC), Los Angeles, CA
- **Department:** Electrical and Computer Engineering
- **Duration:** August 2018 - May 2025
- **Ph.D. Adviser:** [Prof. Michael J. Neely](#).
- **Research Focus:** Convex Optimization

- * Nonsmooth Convex Functions
- * Large-Scale (High-Dimensional) Challenges
- * Stochastic First-Order Methods
- * Projection-Free Techniques
- * Bregman Divergence
- * Online Environments
- * Functional Constraints
- * Primal-Dual Methods
- * Saddle-point problems

- **Courses**

- (ISE-633) Large Scale Optimization and Machine Learning
- (DSCI-552) Machine Learning for Data Science
- (EE-541) A Computational Introduction to Deep Learning
- (EE-649) Stochastic Network Optimization
- (CSCI-570) Analysis of Algorithms
- (ISE-620) Foundations of Stochastic Processes
- (EE-559) Machine Learning I: Supervised Methods
- (EE-562) Random Processes in Engineering
- (EE-550) Data Networks: Design and Analysis
- (MATH-425A) Fundamental Concepts of Analysis

(EE-514) Quantum Error Correction
(ENGR-503x) Oral Communication Skills for Engineering Ph.D. Students

- **Bachelor of Science in Electrical Engineering**

- **Institution:** Sharif University of Technology (SUT), Tehran, Iran
- **Department:** Department of Electrical Engineering
- **Specialization:** Communication Systems
- **Duration:** Aug 2014 - Aug 2018

Publications

- **Nonsmooth Projection-Free Optimization with Functional Constraints**

In this paper, I contributed to the design of a Frank-Wolfe-type algorithm for general stochastic nonsmooth convex programming. The feasible set has a linear minimization oracle, and both the objective function and constraint functions utilize stochastic first-order oracles.

- Presented at the *2023 INFORMS Annual Meeting*.
- Submitted to *Computational Optimization and Applications, Springer*.
- Preprint: arxiv.org/abs/2311.11180.

- **Bregman-Style Online Convex Optimization with Energy Harvesting Constraints**

This paper, to which I significantly contributed, introduces an improved algorithm for time-varying energy-constrained online convex optimization. It optimizes decision vectors more efficiently and employs two different Bregman divergences for enhanced performance.

- Published in *Proceedings of the ACM on Measurement and Analysis of Computing Systems, 2020*.
- Presented at *ACM SIGMETRICS 2021*.
- DOI: [10.1145/3428337](https://doi.org/10.1145/3428337).

- **Identifying Arguments of Space-Time Fractional Diffusion: Data-Driven Approach**

In this study, I played a key role in developing data-driven methods to identify and parameterize fractional partial differential equations for modeling complex systems.

- Published in *Frontiers in Applied Mathematics and Statistics* (May 2020).
- DOI: [10.3389/fams.2020.00014](https://doi.org/10.3389/fams.2020.00014).

Experience

- **Research Assistant at Communication, Information, Learning, and Quantum (CILQ) Group**

- **Institution:** USC
- **Duration:** Aug 2019 - May 2025
- **Adviser:** [Prof. Michael J. Neely](#).
- **Publication:**
 - * Nonsmooth Projection-Free Optimization with Functional Constraints
 - * Bregman-Style Online Convex Optimization with Energy Harvesting Constraints

- **Research Assistant at Cyber-Physical Systems Group**

- **Institution:** USC
- **Duration:** Aug 2018 - May 2019

- **Description:**
- **Adviser:** [Dr. Paul Bogdan](#).
- **Publication:**
 - * Identifying Arguments of Space-Time Fractional Diffusion, Data-Driven Approach
- **Teaching Assistant, Probability for Electrical and Computer Engineers (EE503)**
 - **Institution:** USC
 - **Duration:** Fall 2023 & Fall 2019
 - **Instructor:** [Prof. Konstantinos Psounis](#).
- **Teaching Assistant, Design and Analysis of Computer Communication Networks (EE550)**
 - **Institution:** USC
 - **Duration:** Spring 2023
 - **Instructor:** [Prof. Michael J. Neely](#).
- **Undergraduate Research Assistant at the Optical Networks Research Laboratory**
 - **Institution:** SUT
 - **Duration:** Aug 2017 - Apr 2018
 - **Adviser:** [Prof. Jawad A. Salehi](#).
 - Development and Evaluation of DNA Sequence Alignment Utilizing Optical Parallel Processing Techniques.
- **Undergraduate Research Intern. at the Advanced Communications Research Institute**
 - **Institution:** SUT
 - **Duration:** Summer 2016
 - **Adviser:** [Prof. Marvasti, Farokh](#).
 - Exploring Matrix Completion and Compressed Sensing via Convex Optimization Methods.

Course Projects

- **Image Classification of American Sign Language**
 - Developed a convolutional neural network (CNN) using PyTorch for classifying ASL gestures, part of EE-541 (Computational Introduction to Deep Learning) at USC, instructed by Dr. Brandon Franzke, Fall 2022.
 - Analyzed a dataset of 87,000 images across 29 classes.
 - Achieved accuracies of 99.64% (training), 97.41% (validation), and 97.56% (testing).
 - Enhanced computational performance using NVIDIA Quadro RTX 5000.
 - Libraries: PyTorch, Torch-Summary, Matplotlib, Pandas, Seaborn, Numpy.
 - Project Repository: [kamiaras/Image-Classification-of-American-Sign-Language](#).
- **Image Classification of 20 Bird Species using Transfer Learning**
 - Created a CNN leveraging EfficientNetB0 and VGG16 for bird species recognition in DSCI-552 (Machine Learning for Data Science) at USC, guided by Dr. Mohammed Reza Rajati, Summer 2023.
 - Attained accuracies: 98.1% (EfficientNetB0, training+val), 96.2% (VGG16, training+val), 94.9% (EfficientNetB0, test), 89.6% (VGG16, test).
 - Libraries:: Keras, OpenCV, Matplotlib, Pandas, Seaborn, Numpy.
 - Project Details: [kamiaras/DSCI-552-Machine-Learning-for-Data-Science](#).

Technical Skills

- Mathematical Skills
 - Convex Optimization: ★★★★★
 - Convex Analysis: ★★★★★☆
 - Applied Probability: ★★★★★☆
 - Machine Learning and Statistics: ★★★★★☆
 - Theory of Probability: ★★☆☆☆☆
 - Deep Learning: ★★★★★☆
 - Algorithm Design: ★★★★★☆
- Computer Skills
 - Python: Scikit-learn, NumPy, Matplotlib, etc.: ★★★★★
 - Matlab: ★★★★★
 - LaTeX: ★★★★★
 - Deep Learning (CNN): PyTorch, Keras: ★★★★★☆
 - GNU/Linux: ★★★★★☆
 - Git/GitHub: ★★☆☆☆☆
 - C/C++: ★★☆☆☆☆

Soft Skills

- English: Enhanced through completing the Theater Improv course twice, the ENGR-503x course, and experience as a Teaching Assistant.
- Mentorship: Active participant in the Viterbi Graduate Mentorship Program, providing guidance to junior graduate students and sharing expertise.
- Teamwork: Contributed to the Hustle N' Code Hackathon and Viterbi K-12 Center's Annual MESA. Engaged in neighborhood cleanup projects in Koreatown, underscoring a commitment to collaborative and community-oriented initiatives.

Honors and Awards

- **2023:** Winner of Best Poster Award at USC-Arizona Center's 2nd Symposium. Presented research on Nonsmooth Projection-Free Optimization.
- **2014:** National Elite Foundation of Iran Fellowship. Granted a Full Undergraduate Scholarship.
- **2013:** Bronze Medalist in the 23rd Nationwide Iran Physics Olympiad.

Presentations

- Nonsmooth Projection-Free Optimization with Functional Constraints
 - Informs Annual meeting 2023
- Bregman-Style Online Convex Optimization with Energy Harvesting Constraints
 - ACM SIGMETRICS 2021

Research Interests

My research primarily focuses on *Convex Optimization*, emphasizing:

- Black-Box First-Order problems in *Online* and *Stochastic* settings.
- Efficiency in large-scale scenarios using *Bregman Divergence* (mirror descent) and *Projection-Free* techniques.
- Multi-Objective Optimization approaches to address imbalanced datasets.

Looking ahead, I am interested in exploring:

- Online Decision-Making: Including Bandit Algorithms and Online Convex Optimization.
- Theory of Deep Learning: Merging concepts from Convex Optimization, Statistical Learning, Nonequilibrium Thermodynamics, and Approximation Theory.

Mentorship And Volunteering

- Three-time participation in the Viterbi Graduate Mentorship Program.
- Active involvement in community service initiatives through the USC Volunteer Center, including neighborhood cleanup projects in Koreatown.
- Dedicated volunteering with The Viterbi Impact Program, where I contributed to the success of the Viterbi K-12 Center's Annual MESA and Hustle N' Code Hackathon events.

My Other Interests

- I've got a soft spot for physics, and I'm always looking for opportunities to learn more about it.
- I'm a history, economics, and philosophy buff, especially digging into the economies of ancient empires.
- I'm a big fan of comedy, especially stand-up! I had such a blast taking the Improv course at USC not once, but twice!
- Soccer is my favorite sport. Even though my technique isn't perfect, I'm good at understanding the game and playing as a team member.

References

- [Prof. Michael J. Neely](#)
Email: mikejneely@gmail.com
- [Prof. Mihailo R. Jovanovic](#)
Email: mihailo@usc.edu