

Ali Ghafelebashi

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EDUCATION

Ph.D., Industrial Engineering, University of Southern California, **GPA: 3.83/4.0** August 2018-May 2024
M.Sc., Computer Science, University of Southern California, **GPA: 3.83/4.0** August 2019-December 2021
M.Sc., Industrial Engineering, University of Southern California, **GPA: 3.83/4.0** August 2018-December 2020
B.Sc., Industrial Engineering, Amirkabir University of Technology, **GPA: 4.0/4.0** September 2014-June 2018

Selected courses: Machine Learning, Deep Learning, Artificial Intelligence, Analysis of Algorithms, Database Systems

SKILLS

Programming Languages: Python, SQL, C/C++, MATLAB, HTML, CSS

Frameworks: PyTorch, PyG, TensorFlow, Keras, scikit-learn, NumPy, pandas, Git, Spark, Gurobi, OR-Tools

WORK EXPERIENCE

Machine Learning & Data Science Intern, Shipt June 2023-August 2023

- Achieved **6%** shopper acquisition cost reduction by developing an optimization model (ILP) (OR-Tools, PuLP, SQL)
- Improved shopper retention prediction accuracy by **3%** by utilizing LightGBM and including more features

Data Science (Full Stack) Intern, Shipt May 2022-August 2022

- Enhanced statistical power of delivery bundling experiment by **7%** by providing a simulation-based power estimation package (SQL, pandas, NumPy)
- Increased speed of treatment group selection by **12×** by designing optimization-based (MIQP) package (CVXPY, Git)

Research Assistant, University of Southern California August 2018-Present

Trustworthy Machine Learning: Inter-Silo Differentially Private Federated Learning (Published at *AISTATS 2023*)

- Boosted training speed on GPU up to **15×** by computing Jacobian instead of utilizing backprop (PyTorch, CUDA)
- Implemented a private algorithm and outperformed benchmark models by up to **5%** in accuracy of vision tasks

Interpretable Machine Learning: A Unifying Framework to the Analysis of Interaction Methods using Synergy Functions (Published at *ICML 2023 Workshop on Interpretable Machine Learning in Healthcare*)

- Developed different interpretability methods using Synergy function (PyTorch)
- Analyzed various interpretability methods in a healthcare regression task on protein structure data

Traffic Congestion Reduction via Personalized Incentives (Published at *Transportation Research Part C: Emerging Technologies*, Funded by USDOT, Caltrans, and NCST)

- Improved travel time of Los Angeles data by **5%** via designing a personalized incentive optimization model (Gurobi)
- Extracted and preprocessed real-time traffic data of Los Angeles (SQL, pandas, NumPy, NetworkX, ArcGIS)

Incentive Systems for Fleets of New Mobility Services (Funded by USDOT and NCST)

- Enhanced traffic efficiency of Los Angeles data by **7%** travel time reduction by providing an organization-level incentive optimization model (CVX, MOSEK, Batch Scripting)
- Increased cost-efficiency of incentivization by **8×** through incentivizing new mobility services instead of individuals

ACADEMIC PROJECTS

Deep Generative Models & Language Modeling November 2020

- Implemented *GAN* and *Activation Maximization* to generate new images similar to CIFAR-10 (PyTorch)
- Designed *RNN-based* and *LSTM-based NLP generative model* to follow writing style of input data (PyTorch)

HONORS AND AWARDS

Awarded \$5,000 Intelligent Transportation Society of California (ITSCA) Scholarship with only four recipients (2023)

Won USC Annual Three Minute Thesis (3MT) Director's Award for Best Research Translation (2023)

Ranked 1st in Department of Industrial Engineering at Amirkabir University of Technology (2014 –2018)