

# Ali Ghafelebashi

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## INTRODUCTION

Ph.D. candidate looking for next opportunity to apply **5+ years** of experience in **machine learning & optimization**.

## EDUCATION

**Ph.D., Operations Research**, 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:** Python, C/C++, R, Git
- **Machine Learning:** scikit-learn, Pandas, Numpy
- **Deep Learning:** PyTorch, Tensorflow, PyG
- **Visualization:** Tableau, Matplotlib
- **Database:** SQL, MongoDB
- **Big Data:** Spark, HPC
- **Optimization:** Gurobi, CVX, OR-Tools, AMPL
- **Generative AI:** GANs, Diffusion Models

## 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 accuracy of shopper retention/churn prediction by **3%** through utilizing LightGBM

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

- Enhanced power of delivery bundling experiment by **7%** by simulation-based power estimation (SQL, pandas, NumPy)
- Increased treatment group selection speed 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

**Traffic Congestion Reduction via Personalized Incentives** (Published at 2023 *Transportation Research Part C* Journal)

- 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)

**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

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

- Enhanced Los Angeles travel time by **7%** by providing an organization incentivization optimization model (CVX)
- Boosted incentivization cost-efficiency **8×** by targeting organizations (e.g., Uber & Lyft), 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 1<sup>st</sup>** in Department of Industrial Engineering at Amirkabir University of Technology (2014 –2018)