

Berk Idem

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Professional Experience

Machine Learning Researcher

2022- Present

Pennsylvania State University

University Park, PA

- Developed and implemented deep learning models by combining terabytes of images with structured weather data to predict air pollution, with the end goal of evaluating policies related to pollution.
- Achieved over 10% improvement in the performance of state-of-the-art air pollution predictions.
- Utilized Python and libraries such as PyTorch, Pandas, Scikit-learn, NumPy, LightGBM, and XGBoost.

Graduate Research and Teaching Assistant

2016- 2022

Pennsylvania State University

University Park, PA

- Collaborated on academic research in Optimization, Computer Science, and Statistics, leveraging Python and MATLAB skills.
- Taught Introduction to Economics, Microeconomics, and Game Theory (~150 students/year), including lecturing and grading.

Graduate Research Assistant

2014- 2016

Bilkent University

Ankara, Turkey

- Assisted academic research on Econometrics and Statistics using Python and Mathematica.

Education

Pennsylvania State University

University Park, PA

Ph.D. in Economics (Econometrics and Quantitative Economics)

2022

Bilkent University

Ankara, Turkey

M.A. in Economics

2016

Bilkent University

Ankara, Turkey

B.A. in Economics

2014

Relevant Skills

Machine Learning: Random Forests, Gradient Boosting, Deep Learning & Neural Networks, Computer Vision, NLP

Econometrics: Logistic Regression, Causal Inference, Experimental Design, A/B Testing, Synthetic Controls, Reduced-Form Analysis, Panel Data, Time Series

Programming Skills: Python (NumPy, Pandas, PyTorch, Geopandas, Scikit-Learn, Tensorflow, Keras, Matplotlib, Seaborn), SQL, Mathematica, MATLAB, HTML, CSS

Other Software Skills: Linux, Git, Docker, Gurobi, \LaTeX , WSL, MS Office

Economics: Statistical Modeling, Simulations, Optimization, Operations Research, Game Theory, Auctions, Market Design

Languages: English (fluent), Spanish (intermediate), Italian (beginner), Turkish (native)

Selected Projects

Optimal Design of Two-Sided Marketplaces

Developed a comprehensive strategy for a two-sided marketplace (e.g. Uber, Airbnb) that optimizes incentives for both buyers and sellers while maximizing profit. Utilized a multi-disciplinary approach, leveraging skills in Mathematical Modeling, Operations Research, and Simulations to devise a solution that achieves a significant market share of 50%.

Predicting Air Pollution Using Deep Learning

Predicted air pollution levels by developing a deep learning pipeline that combines computer vision and gradient-boosting frameworks. Analyzed satellite imagery and geospatial data as part of a team.

Pulsar Star Classification

Contributed to a team of researchers in developing classification models to identify Pulsar stars using various methods including random forests (Scikit-learn), gradient boosting (XGBoost, LightGBM, CatBoost) and neural networks (PyTorch).

Selected Conference and Seminar Presentations

Invited seminars at Koc U., Corvinus U., NYU-AD; Social Choice & Welfare; European Meeting of GT 2022

European Winter Meeting of ES; Midwest ET Conference (MSU); Economics and Computation; Stony Brook GTC 2021

Conference on Mechanism and Institution Design 2020