

# Berk Idem

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## Professional Experience

### Pennsylvania State University

Machine Learning Researcher

University Park, PA

2022- Present

- Processing and extracting features from (8 TBs of) satellite images using CNNs to make air pollution predictions.
- Creating and improving models for air pollution predictions by combining structured and unstructured data.

### Pennsylvania State University

Graduate Research Assistant

University Park, PA

2018- 2022

- Assisting academic research on market design, game theory, and sequential auctions.

### Pennsylvania State University

Graduate Teaching Assistant

University Park, PA

2016- 2021

- Teaching Introduction to Economics, Intermediate Microeconomics, and Game Theory classes (~150 students/year).
- Preparing recitation materials; holding recitation sessions and office hours; coordinating and mentoring graders.

## Relevant Skills

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

**Machine Learning:** Random Forests, Gradient Boosting, PCA, SVM, KNN, Deep Learning, Neural Networks, NLP

**Programming Skills:** Python (NumPy, Pandas, Scikit-Learn, Tensorflow, Keras, Torch, 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, Market Design

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

## Education

### Pennsylvania State University

PhD in Economics (Econometrics and Quantitative Economics)

University Park, PA

2022

### Bilkent University

MA in Economics

Ankara, Turkey

2016

### Bilkent University

BA in Economics

Ankara, Turkey

2014

## Selected Academic Papers

FIELDS: Applied Microeconomics, Industrial Organization, Market Design, Mechanism Design, Game Theory, Auctions

ADVISORS: Prof. Vijay Krishna (chair), Prof. Kalyan Chatterjee, Prof. Nima Haghpahan, Prof. Ran Shorrer

*Coexistence of Centralized and Decentralized Markets (Job Market Paper)*

- Computed the profit of a platform without needing the distribution of consumer valuations and made predictions about the market shares of platforms

- Utilized both symbolic and numerical computational methods, Mathematica, Python

*Existence of Stable Matchings without Substitutability*

- Studied many-to-one matchings and multi-unit auctions; obtained conditions under which the market is stable
- Simulated preferences and computed stable outcomes on high-performance cloud-based computing infrastructure using Python

## 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; Economics and Computation (EC); Story Brook GTC 2021

Conference on Mechanism and Institution Design 2020

PSU Applied Microeconomics Workshop; PSU Economic Theory Workshop 2017-2022