ILGIN DOGAN

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Education

University of California, Berkeley

Ph.D. in Industrial Engineering and Operations Research — May, 2024 (expected)
M.Sc. in Industrial Engineering and Operations Research — 2019

Middle East Technical University, Ankara, Turkiye

M.Sc. in Industrial Engineering — 2018
B.Sc. in Industrial Engineering — 2016

Research Interests

Methodologies: Sequential and Data-driven Decision Analytics, Statistical Learning, Optimization Theory, Principal-Agent Theory, Multi-Objective Combinatorial Optimization.

Applications: Sustainability Analytics, Supply Chain Management, Healthcare Analytics.

Research Papers

Ilgin Dogan, Zuo-Jun Max Shen, and Anil Aswani. Repeated Principal-Agent Games with Unobserved Agent Rewards and Perfect-Knowledge Agents. *Preprint.*

Ilgin Dogan, Zuo-Jun Max Shen, and Anil Aswani. Repeated Principal-Agent Games with Unobserved Rewards: Learning Agents with Imperfect Knowledge. *Preprint.*

Yoon Lee, **Ilgin Dogan**, Anil Aswani, and Zuo-Jun Max Shen. Incorporating Fairness into Incentive Design in Principal-Agent Models with Adverse Selection and Moral Hazard. *Working paper.*

Ilgin Dogan, Zuo-Jun Max Shen, and Anil Aswani. Regret Analysis of Learning-Based MPC with Partially-Unknown Cost Function. *Under revision for IEEE Transactions on Automatic Control.*

Ilgin Dogan, Banu Lokman, and Murat Koksalan. (2022). Representing the Nondominated Set in Multi-objective Mixed-integer Programs, European Journal of Operational Research, Vol. 296 (3), pp. 804-818.

Invited Talks

Repeated Principal-Agent Games with Unobserved Agent Rewards and Perfect-Knowledge Agents.

- 2023, Annual POMS Conference, Orlando, FL.
- 2022, INFORMS Annual Meeting, Indianapolis, IN.

Repeated Principal-Agent Games with Unobserved Rewards: Learning Agents with Imperfect Knowledge.

- 2023, INFORMS Annual Meeting, Phoenix, AZ.
- 2023, Annual POMS Conference, Orlando, FL.

Regret Analysis of Learning-Based MPC with Partially-Unknown Cost Function.

- 2021, INFORMS Annual Meeting, Anaheim, CA.
- 2020, INFORMS Annual Meeting, Virtual.

Representing the Nondominated Set in Multi-objective Mixed-integer Programs.

- 2019, INFORMS Annual Meeting, Seattle, WA.
- 2018, INFORMS Annual Meeting, Phoenix, AZ.
- 2017, International Conference on MCDM, Ottawa, Canada.

Teaching Experience

Industrial Engineering & Operations Research, University of California, Berkeley

Instructor:

- INDENG 151 - Service Operations Design and Analysis — Fall 2022
  Teaching effectiveness evaluation: 6.72 / 7.00 (Department average: 6.03)

Graduate Student Instructor:

- INDENG 151 - Service Operations Design and Analysis — Fall 2019, Fall 2020
  Teaching effectiveness evaluation: 4.60 / 5.00 (Department average: 4.27)
- INDENG 165 - Engineering Statistics, Quality Control, and Forecasting — Spring 2020
  Teaching effectiveness evaluation: 4.62 / 5.00 (Department average: 3.95)

Haas School of Business, University of California, Berkeley

Reader:

- UGBA 141 - Production and Operations Management — Spring 2021

Department of Industrial Engineering, Middle East Technical University

Undergraduate and Graduate Teaching Assistant: 2015 - 2018

- Courses: Stochastic Optimization with Applications / Management Accounting / Engineering Economy / Engineering Statistics, Quality Planning and Control / Quality in Engineering Management / Special Topics in IE: Multi-objective Combinatorial Optimization.

Research Experience

University of California, Berkeley 2019 - present

Graduate Student Researcher - Department of Industrial Engineering & Operations Research

Turkish Scientific and Technological Research Council (*NSF-equivalent*) 2016 - 2018

Research Scholar

Project: Nondominated Points of Multi-objective Integer Programs: Approaches and Applications

- Developed efficient algorithms that aim at producing a small number of representative nondominated points (up to 50% less than the existing approaches) while satisfying a prespecified coverage gap value for combinatorial multi-objective mixed-integer programs.
- Conducted extensive simulation experiments in C using CPLEX for mixed-integer knapsack and assignment problems with up to 5 objectives.

Middle East Technical University (METU) 2015 - 2016

System Design Project Analyst

Project: Designing a sustainable and data-driven in-campus transportation system (bike-share and shuttle services) for the METU, Ankara campus (11,100 acres).

- Collected and wrangled categorical and numerical data using SQL. Performed root-cause analysis.
- Developed a multi-objective optimization model considering the conflicting goals of different stakeholders in a large socio-technical system.
- Conducted empirical analyses on real data using a simulation model developed in Arena.
- Achieved a 15% decrease in total travel distances of the shuttles (due to the increase in the non-motorized trips) and a 5% decrease in the average travel time per person in the transportation network.

Industrial Experience

Meta Summer 2022

Research Data Scientist Intern

Infrastructure Strategy Data Science, Menlo Park, CA

- Project: Targeting viewers and broadcasters for providing ultra-low end-to-end latency during live streams.

- Developed a framework that includes several components from implementing data analysis, building and maintaining data pipelines, developing and productionizing machine learning models.
- Achieved 70% precision and 63% recall with 91% coverage of total latency-sensitive broadcast watch time with the proposed classification model.

Robert BOSCH GmbH Summer 2015

Long-term Project Intern

Department of Deployment of Business Excellence, Bursa, Turkiye

- Project: Enhancing deployment of continuous improvement techniques in the organization by following the Kaizen and lean manufacturing methodologies.
- Developed statistical quality control models to facilitate process improvement in the organization.
- Experienced the company culture, attended weekly departmental meetings. Presented the project results to the executive management.

BAUER Casings Summer 2014

Service Operations Intern

Department of Production Planning, Ankara, Turkiye

- Monitored and reported on daily data using company's ERP database system.
- Gained understanding of a complete flow of production and operational processes in the plant.
- Experienced the company culture, attended weekly departmental meetings.

Honors, Fellowships, and Awards

- IEOR Faculty Fellowship, University of California, Berkeley, 2021.
- Outstanding Graduate Student Instructor Award, University of California, Berkeley, 2021.
- Ph.D. First-year Fellowship, IEOR, University of California, Berkeley, 2018-2019.
- Graduate Research Fellowship, TUBITAK (*NSF-equivalent*), 2017-2018.
- Graduate Courses Performance Award, METU, 2018.
- Dean's High Honor List in B.Sc., Department of Industrial Engineering, METU, 2016.

Computer Skills

- Programming Languages: C, Python, SQL.
- ML Frameworks & Libraries: Scikit-Learn, SciPy, Pandas, NumPy, Matplotlib.
- Tools: LaTex, Microsoft Office.
- Statistical Softwares: RStudio, Minitab.
- Optimization Softwares: Gurobi, CPLEX, GAMS.
- Simulation Softwares: Arena (Siman).

Services and Society Activities

- **Graduate Mentor:** UC Berkeley Engineering Summer Undergraduate Research Program (BESURE), 2023.
- **Session Chair:**
  - "Responding Climate Crisis with Data-Driven OM" and "Stochastic Approaches to Healthcare Analytics" in 2023 INFORMS Annual Meeting.
  - "Incorporating AI into Healthcare Delivery" and "ML for Healthcare Applications" in 2022 INFORMS Annual Meeting.
- **Reviewer:** INFORMS Journal on Data Science.
- **Participant:** POMS Doctoral Consortium, 2023.
- **Participant:** INFORMS Doctoral Student Colloquium, 2020.
- **Participant:** Theory of Reinforcement Learning Boot Camp, Deep Reinforcement Learning Workshop, by The Simons Institute for the Theory of Computing, 2020.
- **Member:** INFORMS, POMS, MCDM.