Ilker Demirel

ML/CS PhD Candidate at MIT

LinkedIn
☎ *1-857-706-9305*
✉ *demirel@mit.edu*
demireal.github.io

Research Interests: causal inference, LLMs, reasoning, sample-efficient learning, precision medicine, health AI

Education

2022–now **Massachusetts Institute of Technology**, PhD
Computer Science, GPA – 5.00/5.00
Advisor: David Sontag

2020 and 2022 **Bilkent University**, BS and MS
Electrical and Electronics Engineering, GPA – 3.90/4.00 (BS), 3.91/4.00 (MS)

Experience

Research & Industrial

Summer'25 **PhD Research Intern**, Apple
- Developed benchmarks and methods for multimodal reasoning with LLMs

Summer'24 **PhD Research Intern**, Microsoft
- Developed scalable ML algorithms for learning representations of the personal adaptive immune system

2022-now **PhD Fellow**, Eric and Wendy Schmidt Center at the Broad Institute of MIT and Harvard

2022-now **Graduate Student (PhD)**, Massachusetts Institute of Technology
- Integrating experimental and observational data for causal inference, LLMs for precision medicine

2020-2022 **Graduate Student (MS)**, Bilkent University
- Bayesian optimization, multi-armed bandits, reinforcement learning, federated learning

2019-2020 **Senior Design Project**, NanoMagnetics Instrument and Bilkent University
- Implemented safe online learning algorithms to tune an atomic force microscope as a team

Summer'19 **Undergrad Intern**, Robotics and Control Laboratory, University of British Columbia
- Developed deep reinforcement learning algorithms for point-of-care ultrasound

Summer'18 **Undergrad Intern**, DataBoss Security and Analytics
- Developed anomaly detection algorithms for network security

Teaching

Spring'25 **Teaching Assistant**, *6.7930/HST.956 ML for Healthcare*, Massachusetts Institute of Technology

Spring'22 **Teaching Assistant**, *EEE485/585 Statistical Learning and Data Analytics*, Bilkent University

F'20'21, S'21 **Teaching Assistant**, *EEE212 Microprocessors*, Bilkent University

Publications (*equal contribution)

Preprint

[P1] Uncovering bias mechanisms in observational studies [paper]
ID*, Z. Hussain*, P.D. Bartolomeis, D. Sontag, ***arXiv***.

Conference

[C9] Prediction-powered causal inferences [paper]
R. Cadei, **ID***, P.D. Bartolomeis*, L. Lindorfer, S. Cremer, C. Schmid, F. Locatello, ***NeurIPS 2025***.

[C8] Using LLMs for late multimodal sensor fusion for activity recognition [paper]
ID, K. Thakkar, B. Elizalde, S. Ren, J. Narain, ***NeurIPS 2025, Time Series for Health Workshop***.

[C7] Scalable universal T-cell receptor embeddings from adaptive immune repertoires [paper]
P. Chapfuwa, **ID**, L. Pisani, J. Zazo, E. Portugaly, H. Zahid, J. Greissl, ***ICLR 2025***.

[C6] Prediction-powered generalization of causal inferences [paper]
ID, A. Alaa, A. Philippakis, D. Sontag. ***ICML 2024***.

[C5] Benchmarking observational studies with experimental data under right-censoring [paper]
ID, E.D. Brouwer, M. Oberst, Z. Hussain*, A. Philippakis, D. Sontag. ***AISTATS 2024***.

[C4] Falsification of internal and external validity in observational studies via conditional moment restrictions [paper]
Z. Hussain*, M.C. Shih*, M. Oberst, **ID**, D. Sontag. ***AISTATS 2023***.

[C3] Escada: Efficient safety and context aware dose allocation for precision medicine [paper]
ID, A.A. Celik, C. Tekin. ***NeurIPS 2022***.

[C2] Combinatorial gaussian process bandits with probabilistically triggered arms [paper]
ID, C. Tekin. ***AISTATS 2021***.

[C1] Accuracy limits of distance estimation in visible light systems with RGB LEDs [paper]
ID, S. Gezici. ***IEEE PIMRC 2019***.

Journal

[J2] Federated multi-armed bandits under byzantine attacks [paper]
A. Saday, **ID**, Y. Yildirim, S. Gezici. ***IEEE Transactions on Artificial Intelligence, 2025***.

[J1] Distance and position estimation in visible light systems with RGB LEDs [paper]
ID, S. Gezici. ***DSP Elsevier, 2022***.

Invited Talks

Jul 2025 **Paris AI4Health School**, Delivered a workshop on causal inference for precision medicine
Feb 2025 **Harvard Data Science Initiative Causal Seminar**, Served as the discussant
Oct 2024 **MIT LIDS Postdoc Seminar**, Gave a talk on prediction-powered causal inference
March 2022 **Uludag University School of Medicine**, Gave a talk on personalized type-1 diabetes treatment

Honors and Awards

2022–2024 **PhD Fellowship**, Eric and Wendy Schmidt Center at the Broad Institute of MIT and Harvard
2020–2022 **5G and Beyond Graduate Fellowship**, Vodafone and Bilkent University
2015–2020 **High Honor Student**, Bilkent University
2015–2020 **Comprehensive Undergraduate Scholarship**, Bilkent University
2015–2020 **Academic Excellence Scholarship**, Turkey Higher Education Student Loan and Housing Board

Reviewing

NeurIPS 2025 – Top Reviewer
JMLR, NeurIPS, ICML, ICLR, AISTATS, AAAI, ML4H, IEEE