Mustafa O. Karabag

karabag@utexas.edu | github.com/mustafakarabag

Education

The University of Texas at Austin *TX, USA*
Ph.D. in Electrical & Computer Engineering *May 2019 - August 2023*
Advisor: Ufuk Topcu

The University of Texas at Austin *TX, USA*
M.S. in Electrical & Computer Engineering *August 2017 - May 2019*
Cumulative GPA Over 30 Credits – 3.93

Bogazici University *Istanbul, Turkey*
B.S. in Electrical & Electronics Engineering *September 2012 - June 2017*
Minor in Economics
Cumulative GPA Over 145 Credits – 3.94 | Graduated 2nd in the department and 3rd in the Faculty of Engineering

The University of Texas at Austin *TX, USA*
Electrical & Computer Engineering *August 2015 - December 2015*
Exhange Program | Cumulative GPA Over 15 Credits – 4.00

Experience

The University of Texas at Austin *TX, USA*
Postdoctoral Fellow *September 2023 - Present*
- Developing theory and algorithms for planning under limited information and adversarial conditions. Mentoring Ph.D. students on various research projects.

The University of Texas at Austin *TX, USA*
Graduate Research Assistant *September 2017 - August 2023*
- Developed theory and algorithms for planning under limited information and adversarial conditions. Published 12 papers in top artificial intelligence conferences (AAAI, AAMAS, UAI) and control journals (IEEE TAC), and presented research outcomes at 11 invited talks.

The University of Texas at Austin *TX, USA*
Teaching Assistant *August 2021 - December 2021*
August 2022 - December 2022
- Prepared course material for recitation sessions and held weekly office hours.

Temsa *Adana, Turkey*
R&D Intern *July 2016 - August 2016*
- Prepared a technical report and presentations on lithium-ion electric bus batteries focusing on safety standards and tests. Designed and implemented an algorithm for electric bus range calculations under varying road, speed, and weight conditions.

Aselsan *Ankara, Turkey*
R&D Intern *June 2016 - July 2016*
- Designed and implemented algorithms for real-time rendering from cube map projections and construction of cube map projections. Developed programs to convert equirectangular projects into cube map projections, vice versa. Presented the results of my work to the Defense Systems Technologies Division.
- Developed an XML editor software using C# according to the desired design specifications.

Publications and Preprints

* indicates equal contribution

Encouraging Inferable Behavior for Autonomy: Repeated Bimatrix Stackelberg Games with Observations *2022*
Mustafa O. Karabag, Sophia Smith, David Fridovich-Keil, Ufuk Topcu
Under Review

Deceptive Planning for Resource Allocation *2023*
Shengui Chen, Yagiz Savas, **Mustafa O. Karabag**, Brian Sadler, Ufuk Topcu
Under Review

Simulator-Driven Deceptive Control via Path Integral Approach *2023*
Apurva Patil*, **Mustafa O. Karabag***, Takashi Tanaka, Ufuk Topcu
IEEE Conference on Decision and Control (CDC)

Scenario-Game ADMM: A Parallelized Scenario-Based Solver for Stochastic Noncooperative Games *2023*
Jingqi Li, Chih-Yuan Chiu, Lasse Peters, Fernando Palafox, **Mustafa O. Karabag**,
Javier Alonso-Mora, Somayeh Sojoudi, Claire Tomlin, David Fridovich-Keil
IEEE Conference on Decision and Control (CDC)

Differential Privacy in Cooperative Multiagent Planning *2023*
Bo Chen*, Calvin Hawkins*, **Mustafa O. Karabag***, Cyrus Neary*, Matthew Hale, Ufuk Topcu
Uncertainity in Artificial Intelligence (UAI)

Designing Minimally-Dependent Multiagent Systems that are Robust to Communication Loss *2022*
Mustafa O. Karabag*, Cyrus Neary*, Ufuk Topcu
Under review at *The Journal of Autonomous Agents and Multiagent Systems (JAAMAS)*

On the Sample Complexity of Vanilla Model-Based Offline Reinforcement Learning with Dependent Samples *2022*
Mustafa O. Karabag, Ufuk Topcu
AAAI Conference on Artificial Intelligence (AAAI)

Alternating Direction Method of Multipliers for Decomposable Saddle-Point Problems *2022*
Mustafa O. Karabag, David Fridovich-Keil, Ufuk Topcu
Annual Allerton Conference on Communication, Control, and Computing

Exploiting Partial Observability for Optimal Deception *2022*
Mustafa O. Karabag, Melkior Ornik, Ufuk Topcu
IEEE Transactions on Automatic Control (IEEE TAC)

Planning Not to Talk: Multiagent Systems that are Robust to Communication Loss *2022*
Mustafa O. Karabag*, Cyrus Neary*, Ufuk Topcu
The International Conference on Autonomous Agents and Multiagent Systems (AAMAS)

Smooth Convex Optimization using Sub-Zeroth-Order Oracles *2021*
Mustafa O. Karabag, Cyrus Neary, Ufuk Topcu
AAAI Conference on Artificial Intelligence (AAAI)

Identity Concealment Games: How I Learned to Stop Revealing and Love the Coincidences *2021*
Mustafa O. Karabag, Melkior Ornik, Ufuk Topcu
Provisionally Accepted to *Automatica*

Deception in Supervisory Control *2019*
Mustafa O. Karabag, Melkior Ornik, Ufuk Topcu
IEEE Transactions on Automatic Control (IEEE TAC)

Optimal Deceptive and Reference Policies for Supervisory Control *2019*
Mustafa O. Karabag, Melkior Ornik, Ufuk Topcu
IEEE Conference on Decision and Control (CDC)

Least Inferable Policies for Markov Decision Processes *2019*
Mustafa O. Karabag, Melkior Ornik, Ufuk Topcu
American Control Conference (ACC)

Entropy Maximization for Markov Decision Processes Under Temporal Logic Constraints *2019*
Yagiz Savas, Melkior Ornik, Murat Cubuktepe, **Mustafa O. Karabag**, Ufuk Topcu
IEEE Transactions on Automatic Control (IEEE TAC)

Selected Talks

Deceptive Planning for Supervised Autonomous Agents *October 2022*
Purdue University & The University of Illinois Urbana-Champaign

Deceptive Decision-Making Against Adversaries: Theory, Algorithms, and User Studies *May 2022*
DEVCOM Army Research Laboratory Colloquium

Planning not to Talk: Multiagent Systems that are Robust to Communication Loss *April 2022*

AFOSR Center of Excellence in Assured Autonomy in Contested Environments

Deception in Supervisory Control *July 2021*

SIAM Conference on Control and Its Applications

Smooth Convex Optimization using Sub-Zeroth-Order Oracles *February 2021*

AAAI Conference on Artificial Intelligence (AAAI)

Other Technical Projects

Virtual assistant application for Android in Turkish *Istanbul, Turkey*

Bogazici University, Electrical & Electronics Engineering *Feb 2022 - Apr 2022*

- Developed a voice-enabled virtual assistant application for Android on Java to perform calendar actions. Collected sound samples and implemented a neural network-based algorithm for hotword detection. Developed a framework for natural language processing in Turkish and designed state-machine-based conversation models for user interaction.

Honors and Awards

Student Scholarship – International Conference on Autonomous Agents and Multiagent Systems *2022*

Student Scholarship – Conference on Decision and Control *2019*

High Honors – Bogazici University Faculty of Engineering *2013, 2014, 2015, 2016, 2017*

Outstanding Merit Scholarship – Ministry of Youth and Sports, Turkey *2012, 2013, 2014, 2015, 2016, 2017*

Merit Scholarship – Bogazici University *2012, 2013, 2014, 2015, 2016, 2017*

Service

Volunteer – Code2College Python Instructor *Spring & Fall 2023*

Volunteer – Conference on Decision and Control *2021*

Reviever – International Conference on Artificial Intelligence and Statistics *2022*

Reviever – IEEE Control Systems Letters *2023*

Reviever – IEEE Transactions on Automatic Control *2022*

Reviever – IEEE Transactions on Industrial Electronics *2022*

Reviever – IEEE International Conference on Robotics and Automation *2022*

Reviever – IFAC Workshop on Cyber-Physical and Human Systems *2022*

Reviever – Robotics and Autonomous Systems *2022, 2023*

Reviever – International Conference on Automated Planning and Scheduling *2022, 2023*

Reviever – IEEE Conference on Decision and Control *2022*

Reviever – Proceedings of the Royal Society A *2021*

Reviever – American Control Conference *2021*

Reviever – European Control Conference *2021*

Reviever – IEEE Transactions on Games *2019*