DENIZALP GOKTAS

http://www.denizalpgoktas.com

Research Interests

My research aims to devise and/or analyze multiagent learning algorithms in games and markets, with the ultimate goal of building welfare-improving technology based on these algorithms.

EDUCATION

Brown University	Providence, RI
Ph.D. in Computer Science	July 2024
Thesis: An Algorithmic Theory of General Equilibrium	
Brown University M.S. in Computer Science; Thesis: Tâtonnement in Homothetic Fisher Markets	Providence, RI May 2023
Columbia University	New York, NY
B.A. in Computer Science-Statistics, Magna Cum Laude	May 2019
Paris Institute of Political Studies	Paris, France
B.A. in Political Science-Economics, Magna Cum Laude	May 2019
Experience	

Postdoctoral Researcher
 Sep. 2024 - Nov
 Applied Economic Forecasting: Working on applications of economic forecasting on real-world challenges.

JP Morgan & Co.

Cornell Tech

Research Scientist Intern

• Economics and Multiagent Reinforcement Learning: Working on inverse reinforcement learning problems in games and incomplete markets.

Google DeepMind

Research Scientist Intern

• Economics and Deep Learning: Led and published research at the intersection of AI and Economics.

- Simons Institute, University of California, Berkeley Visting Scholar
 - Visiting scholar under Peter Bartlett: Participated in research seminars and gave a talk on convex-concave min-max Stackelberg games as part of the Learning in Games workshop.

Carnegie Mellon University

Research Assistant

- **Computational Mathematics**: Used the Blaze C++ library to create a proprietary pseudo-inverse routine.
- Object-Oriented Programming: Designed classes and routines using OOP for an agent-based simulation.
- Visualization: Created R scripts using ggplot2 and the Tidyverse packages to analyze output data.

Columbia University

Research Assistant

- Mathematical Modeling: Developed the mathematical model used in the agent-based simulation.
- Algorithm Creation: Invented a many-to-many matching algorithm and proved its mathematical properties.

DNB Markets

Investment Banking Summer Analyst

- Automation: Coded VBA scripts reducing the time needed to create a bond cross-holders list by ~95%.
- Data Aggregation: Created an automated transaction dashboard template for healthcare IPOs.

Hikma Pharmaceuticals

Mergers & Acquisitions Summer Analyst

• Automation: Automated data querying for risk models using python scripts.

New York City, NY Sep. 2024 - Now

New York City, NY Jun. 2023 - Sept 2023

London, United Kingdom

Aug. 2022 - Dec. 2022

Berkeley, California

Jan. 2022 - May. 2022

May. 2019 - Sep. 2020

Jan. 2018 - May 2019

Jun. 2018 - Aug. 2018

Jun. 2017 - Aug. 2017

New York, NY

New York, NY

Amman, Jordan

Algorithmic Game Theory Teaching Assistant

Conference Proceedings

- Randolph, J., Goktas, D., & Greenwald, A. (2024). Banzhaf power in hierarchical games. Proceedings of the International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS'24).
- Goktas, D., Greenwald, A., Zhao, S., Koppel, A., & Ganesh, S. (2024). Efficient inverse multiagent learning. The Twelfth International Conference on Learning Representations.
- Goktas, D., Parkes, D. C., Gemp, I., Marris, L., Piliouras, G., Elie, R., Lever, G., & Tacchetti, A. (2023a). Generative adversarial equilibrium solvers. *The Twelfth International Conference on Learning Representations*.
- Goktas, D., Prakash, A., & Greenwald, A. (2023). Convex-concave zero-sum markov stackelberg games. Proceedings of the Conference on Neural Information Processing Systems (NeurIPS'23).
- Goktas, D., Zhao, J., & Greenwald, A. (2023). Tâtonnement in homothetic fisher markets. Proceedings of the 24th ACM Conference on Economics and Computation, 760–781.
- Zhao, S., Goktas, D., & Greenwald, A. (2023). Fisher markets with social influence. American Association for Artificial Intelligence Conference on Artificial Intelligence, AAAI'23.
- Goktas, D. (2022b). An algorithmic theory of markets and their application to decentralized markets. American Association for Artificial Intelligence Conference on Artificial Intelligence, AAAI'22.
- Goktas, D., & Greenwald, A. (2022b). Robust no-regret learning in min-max Stackelberg games. International Conference on Autonomous Agents and Multi-Agent Systems 2022, AAMAS'22.
- Goktas, D., Zhao, S., & Greenwald, A. (2022a). Exploitability minimization in games and beyond. Neural Information Processing Systems 2022, NeurIPS'22.
- Goktas, D., Zhao, S., & Greenwald, A. (2022c). Zero-sum stochastic Stackelberg games. Neural Information Processing Systems 2022, NeurIPS'22.
- Goktas, D., & Greenwald, A. (2021a). Convex-concave min-max Stackelberg games. Neural Information Processing Systems 2021, NeurIPS'21.
- Goktas, D., Viqueira, E. A., & Greenwald, A. (2021a). A consumer-theoretic characterization of fisher market equilibria. *Conference on Web and Internet Economics, WINE'21*.

Refereed Workshop Papers

- Makar-Limanov, J., Prakash, A., Goktas, D., Ayanian, N., & Greenwald, A. (2024). Sta-rlhf: Stackelberg aligned reinforcement learning with human feedback. Coordination and Cooperation for Multi-Agent Reinforcement Learning Methods Workshop.
- Goktas, D., Parkes, D. C., Gemp, I., Marris, L., Piliouras, G., Elie, R., Lever, G., & Tacchetti, A. (2023b). Generative adversarial equilibrium solvers. *Equilibrium Computation Workshop at the 24th ACM* Conference on Economics and Computation (EC@EC'23).
- Goktas, D., & Greenwald, A. (2022c). Robust no-regret learning in min-max Stackelberg games. Adversarial Machine Learning and Beyond Workshop at the American Association for Artificial Intelligence Conference on Artificial Intelligence, AAAI'22.
- Goktas, D., Zhao, S., & Greenwald, A. (2022b). Zero-sum stochastic Stackelberg games. Workshop on Gamification and Multiagent Solutions, ICLR'22.
- Goktas, D., & Greenwald, A. (2021b). Gradient descent ascent in min-max Stackelberg games. Games, Agents, and Incentives Workshop at International Conference on Autonomous Agents and Multi-Agent Systems 2022, AAMAS'22.
- Goldstein, S. C., Goktas, Denizalp, Conn, M., Pitchuka, S. P. T., Sameer, M., Shah, M., Colin Swett, H. T., Viswanathan, S., & Xiao, J. (2020). Bolt: Building on local trust to solve lending market failure. *Mechanism Design for Social Good, MD4SG'20.*

PRESENTATIONS AND POSTERS

- Goktas, D., Parkes, D. C., Gemp, I., Marris, L., Piliouras, G., Elie, R., Lever, G., & Tacchetti, A. (2023c). Generative adversarial equilibrium solvers. ACM Conference on Economics and Computation, Equilibrium Computation Workshop.
- Goktas, D., Parkes, D. C., Gemp, I., Marris, L., Piliouras, G., Elie, R., Lever, G., & Tacchetti, A. (2023d). Generative adversarial equilibrium solvers. *JP Morgan Sequential Decision Making Group*.
- Goktas, D. (2022a). Algorithmic general equilibrium theory. *Economics for AI group, Google DeepMind*.
- Goktas, D. (2022b). An algorithmic theory of markets and their application to decentralized markets. American Association for Artificial Intelligence Conference on Artificial Intelligence, AAAI'22.
- Goktas, D. (2022c). Stackelberg games and their applications to general equilibrium theory. Oxford University Computer Science Seminar.
- **Goktas**, D. (2022d). Stackelberg games and their applications to general equilibrium theory. London School of Economics, Mathematics Seminar.
- Goktas, D., & Greenwald, A. (2022a). Convex-concave min-max Stackelberg games. Learnig in Games Worshop, University of California, Berkeley.
- Goktas, D. (2021a). Min-max games with dependent strategy sets. Brown Robotics Group.
- Goktas, D. (2021b). Network-theoretic market equilibrium models. CUNY Philosophy and Logic Seminar.
- Goktas, D. (2021c). Tâtonnement beyond constant elasticity of substitution. INFORMS 2021, Forthcoming.
- Goktas, D. (2021d). Tâtonnement beyond constant elasticity of substitution. GAMES 2020.
- **Goktas**, D. (2020). Tâtonnement beyond constant elasticity of substitution. *Faculty Flash Talks Brown University*.
- Goktas, D., Greenwald, A., Zhao, S., Koppel, A., & Ganesh, S. (2024). Efficient inverse multiagent learning. The Twelfth International Conference on Learning Representations.
- Zhao, S., Goktas, D., & Greenwald, A. (2023). Fisher markets with social influence. American Association for Artificial Intelligence Conference on Artificial Intelligence, AAAI'23.
- Goktas, D., Zhao, S., & Greenwald, A. (2022a). Exploitability minimization in games and beyond. *Neural* Information Processing Systems 2022, NeurIPS'22.
- Goktas, D., Zhao, S., & Greenwald, A. (2022c). Zero-sum stochastic Stackelberg games. Neural Information Processing Systems 2022, NeurIPS'22.
- Goktas, D., Viqueira, E. A., & Greenwald, A. (2021b). Tâtonnement beyond constant elasticity of substitution. Stony Brook International Conference on Game Theory.
- Goktas, D., Viqueira, E. A., & Greenwald, A. (2021c). Tâtonnement beyond constant elasticity of substitution. Twenty-Second ACM Conference on Economics and Computation (EC 2021) Contributed Poster.
- Goldstein, S. C., Goktas, Denizalp, Conn, M., Pitchuka, S. P. T., Sameer, M., Shah, M., Colin Swett, H. T., Viswanathan, S., & Xiao, J. (2020). Bolt: Building on local trust to solve lending market failure. Mechanism Design for Social Good, MD4SG'20.

Community Service

HAPPIH

Co-founder and Co-director

• Led an international gender equality campaign through the production and distribution of reusable sanitary pads.

Paris, France

Nov. 2017 - Jun. 2020

- The campaign was endorsed by the government of Monaco and numerous local and international news outlets.
- Grant Management: Was awarded a grant of 10,000€ to execute a humanitarian aid project in Morocco.

Academic Service

Workshop on Computational Methods for Economic Dynamics (EC) Co-Founder and Co-Organizer	2024 -
Workshop on Foundation Models, LLMs, and Game Theory (DIMACS, EC) Co-Founder and Co-Organizer	2023 -
American Association for the Advancement of Artificial Intelligence (AAAI)	2024
Main Track Program Committee Member	
Chaos: Interdisciplinary Journal of Nonlinear Science	2023
Reviewer	

Conference and Workshop on Neural Information Processing Systems (Neur Main Track Program Committee Member	IPS) 2023
International Joint Conferences on Artificial Intelligence (IJCAI) Main Track Program Committee Member	2023
International Joint Conferences on Artificial Intelligence (IJCAI) Special Track on AI and Social Good Program Committee Member	2023
Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS) Reviewer	2023
American Association for the Advancement of Artificial Intelligence (AAAI) Main Track Program Committee Member, Session Chair	2023
American Association for the Advancement of Artificial Intelligence (AAAI) AI for Social Impact Track Program Committee Member, Session Chair	2023
Gamification and Multiagent Solutions Workshop @ ICLR Program Committee Member	2022
Conference on Web, Internet, Economics and Networks (WINE) Reviewer	2021
Cooperative AI Workshop @ NeurIPS Program Committee Member	2021
Games, Agents, and Incentives Workshop (GAIW) @ AAMAS Program Committee Member	2021
Algorithmic Game Theory Research Group Manager	Brown, RI, USA Sept. 2020 - Present
Algorithmic Game Theory Reading Group Organizer	Brown, RI, USA Sept. 2020 - Present
Google ExploreCSR Mentor	Brown, RI, USA Spring 2021
Award and Honors	
American Association for Artificial Intelligence Student Scholarship	Jan. 2023
JP Morgan AI Fellowship	Jan. 2022
Royce Graduate Fellowship	Oct. 2019
Columbia Honor Society	May. 2019
Pi Sigma Beta Honor Society	May. 2019
Jean Louis Dreyfus Scholar	May. 2017
Open Source Software	
Competitive Equilibrium Solver Python library to solve for the allocations and prices of a large class of Fisher markets https://github.com/denizalp/fisher	Sep. 2020 - Present
Mentorship	
Sadie Zhao O Headed for PhD in Computer Science at Harvard O	Graduating May 2023
Jack Ciabaton Now at Jane Street	Graduated May 2022
John Randolph Now at Meta	Graduated May 2022
Shray Mishra Now at Weiss Asset Management	Graduated May 2022
Jackson De Campos Now at Netflix	Graduated May 2022

Languages : French (fluent), Turkish (fluent), Spanish (advanced), Arabic (intermediate)
 Programming : C++, CSS, CVXPY, ggplot2, Haiku, Html, Java, Jax, JaxOPT, Keras, NumPy, Pandas, Python, R, SciPy, SQL, Tensorflow, Tidyverse, VBA