

CEYHUN EKSIN

Texas A&M University
Industrial and Systems Engineering Department
College Station, TX 77843

T: (979) 458 23 63 (Office)
Email: eksinc@tamu.edu
<http://netmas.engr.tamu.edu>

RESEARCH INTERESTS

Game theoretic modeling and optimization of networked multi-agent systems. Topics of interest include evolutionary game theory, autonomous systems, and public health.

Areas of expertise: Game theory, optimization, network theory, and epidemics.

EXPERIENCE

Texas A&M University College Station, TX
Tenure-track Assistant Professor July 2018–
Affiliation: Industrial and Systems Engineering Department

Max Planck Institute for Dynamics and Self-organization Göttingen, Germany
Associate visiting researcher January 2018–June 2018

Texas A&M University College Station, TX
Adjunct Assistant Professor September 2017–June 2018
Affiliation: Industrial and Systems Engineering Department

Georgia Institute of Technology Atlanta, GA
Postdoctoral Researcher April 2015–August 2017
Affiliations: School of Electrical & Computer Engineering, and Biological Sciences
Supervisors: Prof. J.S. Shamma and Prof. J.S. Weitz
Projects: Control and modeling of coevolving networks. Social epidemic models.

EDUCATION

University of Pennsylvania Philadelphia, PA
Ph.D. in Electrical & Systems Engineering May 2015
Thesis: “Bayesian Network Games”
Advisor: Prof. Alejandro Ribeiro

Wharton School of the University of Pennsylvania Philadelphia, PA
M.A. in Statistics May 2015

Boğaziçi University Istanbul, Turkey
M.S. in Industrial Engineering December 2008
Thesis: “Applying Genetic Algorithms to Policy Design in System Dynamics”

Istanbul Technical University Istanbul, Turkey
B.S. in Control Engineering June 2005
Thesis: “Fuzzy Logic Approach to Mimic Decision Making Behavior of Humans in Stock Management Game”

PUBLICATIONS

Book chapters

1. **C. Eksin**, B. Swenson, S. Kar, and A. Ribeiro, “Game Theoretic Learning”, In Cooperative Graph Signal Processing, pp. 209-235, Ch. 7, 2018

In review journals

1. S. Das and **C. Eksin**, "Average submodularity of maximizing anticoordination in network games", (submitted), *SIAM Journal on Control and Optimization*, 2022.
2. A. Karthikeyan, S. Das, S. Bukkapatnam, and **C. Eksin**, "Mathematical Model of Surface Morphology Evolution during Polishing in Additive Manufacturing", (submitted), *IISE Transactions* 2022.
3. F. Sezer, H. Khazaei, **C. Eksin**, "Social welfare maximization and conformism via Information design in linear-quadratic-Gaussian games," (revised), *IEEE Trans. Automatica Control*, 2022.
4. H. Khazaei, **C. Eksin**, R. Khatami, A. Garcia, "Flexible Coupling of Electricity Markets," (submitted), *European Journal of Operations Research*, 2022.
5. S. Aydin and **C. Eksin**, "A Best-Response Algorithm with Voluntary Communication and Mobility Protocols for Mobile Autonomous Teams Solving the Target Assignment Problem," (submitted), *IEEE Control Systems Magazine*, 2021.

Journal publications

1. F. Sezer and **C. Eksin**, "Information Design Preferences of Agents in Linear-Quadratic-Gaussian Games", (to appear), *IEEE Control Systems Letters*, 2022.
2. S. Aydin and **C. Eksin**, "Decentralized Inertial Best-Response with Voluntary and Limited Communication in Random Communication Networks," (to appear), *Automatica*, 2022.
3. L. Hong, A. Garcia, and **C. Eksin**, "Distributed estimation via network regularization," *Automatica*, 2022.
4. A. Garcia, R. Khatami, **C. Eksin**, *F. Sezer, "An Incentive Compatible Mechanism for Market Coupling," *IEEE Trans. Power Systems*, 2022.
5. S. Aydin, S. Arefizadeh, **C. Eksin**, "Decentralized fictitious play in near-potential games with time-varying communication networks," *IEEE Control Systems Letters*, 2022.
6. **C. Eksin**, M. Ndeffo-Mbah, and J.S. Weitz, "Reacting to outbreaks in neighboring localities", *Journal of Theoretical Biology*, 2021.
7. A. Nourmohammad, and **C. Eksin**, "Optimal evolutionary control for artificial selection on molecular phenotypes", *Physical Review X*, 2021.
8. J.S. Weitz, S.W. Park, **C. Eksin**, and J. Dushoff, "Awareness-driven behavior changes can shift the shape of epidemics away from peaks and towards plateaus, shoulders, and oscillations", *The Proceedings of the National Academy of Sciences of the USA (PNAS)*, 117(51), pp. 32764-32771, 2020.
9. **C. Eksin**, and K. Paarporn, "Control of learning in anti-coordination network games", *IEEE Trans. Control of Network Systems*, 7(4), pp. 1823-1835, 2020.
10. **C. Eksin**, K. Paarporn, and J. S. Weitz, "Systematic biases in disease forecasting - the role of behavior change", *Epidemics*, vol. 27, pp. 96-105, 2019.
11. B. Swenson, **C. Eksin**, S. Kar, and A. Ribeiro, "Distributed Inertial Best-Response Dynamics", *IEEE Trans. Autom. Control*, vol. 63, no. 12, 2018.
12. K. Paarporn, **C. Eksin**, and J. S. Weitz, "Information sharing for a coordination game in fluctuating environments". *Journal of Theoretical Biology*, vol. 454, 2018.

13. **C. Eksin** and A. Ribeiro, "Distributed fictitious play for multiagent systems in uncertain environments", *IEEE Trans. Autom. Control*, vol. 63, no. 4, 2018.
14. **C. Eksin**, H. Deliç and A. Ribeiro, "Demand response with communicating rational consumers", *IEEE Trans. Smart Grid*, vol. 9, no. 1, 2018.
15. K. Paarporn, **C. Eksin**, J. S. Weitz, and J. S. Shamma, "Networked SIS epidemics with awareness", *IEEE Trans. Computational Social Systems*, vol. 4, no. 3, 2017
16. **C. Eksin**, J.S. Shamma, J.S. Weitz, "Disease dynamics on a network game: a little empathy goes a long way", *Scientific Reports*, 7:44122, March 2017.
17. J.S. Weitz, **C. Eksin**, K. Paarporn, S.P. Brown, and W.C. Ratcliff, "An oscillating tragedy of the commons in replicator dynamics with game-environment feedback", *Proceedings of the National Academy of Sciences USA*, vol. 113, no. 47, 2016.
18. P. Molavi, **C. Eksin**, A. Ribeiro and A. Jadbabaie, "Learning to coordinate in social networks", *Operations Research*, vol. 64, no. 3, 2016.
19. **C. Eksin**, H. Deliç and A. Ribeiro, "Demand response management in smart grids with heterogeneous consumer preferences", *IEEE Trans. Smart Grid*, vol. 6, no. 6, pp. 3082 - 3094, 2015.
20. **C. Eksin**, P. Molavi, A. Ribeiro and A. Jadbabaie, "Bayesian quadratic network game filters", *IEEE Trans. Signal Process.*, vol. 62, no. 9, pp. 2250-2264, 2014.
21. **C. Eksin**, P. Molavi, A. Ribeiro and A. Jadbabaie, "Learning in networks with incomplete information: asymptotic analysis and tractable implementation of rational behavior", *IEEE Signal Process. Mag.*, vol. 30, no. 3, pp. 30-42, 2013.
22. **C. Eksin** and A. Ribeiro, "Distributed network optimization with heuristic rational agents", *IEEE Trans. Signal Process.*, vol. 60, no. 10, pp. 5396-5411, 2012.

Peer-reviewed conference publications

1. S. Aydin and **C. Eksin** , "Convergence Bounds of Decentralized Fictitious Play Around a Single Nash Equilibrium in Near-Potential Games", *IEEE Conf. on Decision and Control (CDC)*, (to appear), 2022.
2. F. Sezer and **C. Eksin**, "Information Design Preferences of Agents in Linear-Quadratic-Gaussian Games", *IEEE Conf. on Decision and Control (CDC)*, (to appear), 2022.
3. S. Das and **C. Eksin** , "Approximate Submodularity of Maximizing Anticoordination in Network Games", *IEEE Conf. on Decision and Control (CDC)*, (to appear), 2022.
4. H. Khazaei, K. Paarporn, A. Garcia, **C. Eksin**, "Disease Spread Coupled with Evolutionary Social Distancing Dynamics Can Lead to Growing Oscillations," *IEEE Conf. on Decision and Control (CDC)*, 2021.
5. S. Aydin, S. Arefizadeh, **C. Eksin**, "Decentralized Fictitious Play Converges Near a Nash Equilibrium in Near-Potential Games," *Asilomar Conf. on Signals, Systems and Computers*, 2021.
6. S. Aydin and **C. Eksin** , "Decentralized Fictitious Play with Voluntary Communication in Random Communication Networks", *IEEE Conf. on Decision and Control (CDC)*, pp. 337-342, 2020.
7. L. Hong, A. Garcia, and **C. Eksin**, "Distributed Networked Learning with Correlated Data", *IEEE Conf. on Decision and Control (CDC)*, pp. 5923-5928, 2020.
8. S. Aydin and **C. Eksin**, Learning-aware Decentralized Communication and Mobility

- Control for the Target Assignment Problem, *IEEE Conf. on Control Technology and Applications (CCTA)*, pp. 334-339, 2020.
9. **C. Eksin**, Control of stochastic disease network games via influential individuals, *IEEE Conf. on Decision and Control (CDC)*, pp. 6893-6898, 2019.
 10. S. Arefizadeh and **C. Eksin**, Distributed fictitious play in potential games with time-varying communication networks, *Asilomar Conf. Signals, Systems & Comp.*, pp. 1755-1759, 2019.
 11. K. Paarporn, **C. Eksin**, J. S. Weitz, and Y. Wardi, Optimal control policies for evolutionary dynamics with environmental feedback, in *IEEE Conf. on Decision and Control*, pp. 1905-1910, Miami FL, Dec. 17-19 2018.
 12. K. Paarporn and **C. Eksin**, Incentive Control in network anti-coordination games with binary types, *Asilomar Conf. Signals, Systems & Comp.*, pp. 316-320, 2018.
 13. K. Paarporn, **C. Eksin**, J. S. Weitz, and J. S. Shamma, The effect of awareness on networked SIS epidemics, in *IEEE Conf. on Decision and Control*, pp. 973-978, Las Vegas NV, Dec. 10-13 2016.
 14. **C. Eksin**, B. Swenson, S. Kar and A. Ribeiro, Learning pure-strategy Nash equilibria in networked multi-agent systems with uncertainty, in *IEEE Conf. on Decision and Control*, pp. 5292-5297, Las Vegas NV, Dec. 10-13 2016.
 15. **C. Eksin** and A. Ribeiro, Distributed fictitious play in potential games of incomplete information, in *IEEE Conf. on Decision Control*, pp. 5190-5196, Osaka Japan, Dec. 15-18 2015.
 16. K. Paarporn, **C. Eksin**, J. S. Weitz, and J. S. Shamma, Epidemic spread over networks with agent awareness and social distancing, in *53rd Annual Allerton Conference on Communication, Control, and Computing*, pp. 51-57, Monticello IL, Sept. 29 - Oct. 2 2015.
 17. **C. Eksin**, A. Hooshmand and R. Sharma, A decentralized energy management system, in *Proc. European Control Conference (ECC)*, pp. 2260-2267, Linz Austria, July 15-17 2015.
 18. **C. Eksin**, H. Deliç and A. Ribeiro, Smart pricing in demand response management with heterogeneous consumer preferences, in *Proc. American Control Conference (ACC)*, pp. 5692 - 5699, Chicago IL, July 1-3 2015.
 19. **C. Eksin**, H. Deliç and A. Ribeiro, Rational consumer behavior models in smart pricing, *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, pp. 3167-3171, Brisbane Australia, April 19-24 2015.
 20. **C. Eksin**, H. Deliç and A. Ribeiro, "Distributed demand side management for heterogeneous rational consumers in smart grids with renewable sources," *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, pp. 1100-1104, Firenze Italy, May 4-9 2014.
 21. **C. Eksin**, P. Molavi, A. Ribeiro and A. Jadbabaie, "Information aggregation in a beauty contest game," *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, pp. 4783-4787, Firenze Italy, May 4-9 2014.
 22. P. Molavi, **C. Eksin**, A. Ribeiro and A. Jadbabaie, "Learning to coordinate in a beauty contest game," in *Proc. Conf. on Decision and Control*, pp. 7358-7363, Firenze Italy, Dec. 10-13 2013.
 23. **C. Eksin**, P. Molavi, A. Ribeiro and A. Jadbabaie, "Bayesian quadratic network

- game filters,” in *Proc. Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, pp. 4589-4593, Vancouver Canada, March 26-31 2013.
24. **C. Eksin**, P. Molavi, A. Ribeiro and A. Jadbabaie, “Dynamic games with side information in economic networks,” in *Proc. Asilomar Conf. on Signals, Systems and Computers*, pp. 520-524, Pacific Grove CA, Nov. 4-7 2012.
 25. **C. Eksin**, P. Molavi, A. Ribeiro and A. Jadbabaie, “Learning in Linear Games over Networks,” in *Proc. Allerton Conference on Communication, Control and Computing*, pp. 434-440, Monticello IL, Oct. 1-5 2012.
 26. **C. Eksin** and A. Ribeiro, “Heuristic rational models in social networks,” in *Proc. Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, pp. 3077-3080, Kyoto Japan, March 25-30 2012.
 27. B. D. Nye, G. K. Bharathy, B. G. Silverman, and **C. Eksin**. “Simulation-based training of ill-defined social domains: the complex environment assessment and tutoring system (CEATS),” in *Int. Conf. Intelligent Tutoring Systems*, pp. 642-644. Springer Berlin Heidelberg, 2012.
 28. **C. Eksin** and A. Ribeiro, “Network optimization with heuristic rational agents,” in *Proc. Asilomar Conf. on Signals, Systems and Computers*, pp. 53-57, Pacific Grove CA, Nov. 6-9 2011.
 29. **C. Eksin**, B. G. Silverman, D. Pietrocola and R. Kang. “Dimensions of leader-in-context models,” in *Proc. Int. Conf. Cognitive Modeling*, pp. 61-66, Philadelphia PA, Aug. 5-8 2010.
 30. **C. Eksin**, M. Guzelkaya, E. Yesil, and I. Eksin, “Fuzzy logic approach to mimic decision making behavior of humans in stock management game,” in *Proc. Int. Conf. of the System Dynamics Society*, Athens Greece, July 20-24, 2008
 31. **C. Eksin** and A.O. Konuray, “Business dynamics of a record company as influenced by online channels,” in *Proc. Int. Conf. of the System Dynamics Society*, Athens Greece, July 20-24, 2008.
 32. **C. Eksin** and Y. Barlas, “Genetic algorithms for multi-objective optimization in dynamic systems,” in *Proc. Int. Conf. of the System Dynamics Society*, Athens Greece, July 20-24, 2008.

Reports

1. C. Stefan, S. Dommers, **C. Eksin**, R. Sitters, A. Stougie, and L. Stougie. “A PTAS for the multiple depot vehicle routing problem,” *SPOR Report*, No. 2008-03, TU/Eindhoven, Netherlands, 2008.

PATENT

A. Hooshmand, R. Sharma, and **C. Eksin**, “Decentralized Energy Management Platform”, US20150295410, App. No. US 14/681, 2019.

GRANTS

NSF- Computing and Communication Foundations (CCF) 10/2020–9/2023
 “Communication-Aware Decentralized Game-Theoretic Learning Algorithms for Networked Systems with Uncertainty”, Role: **PI, \$361,086**

NSF- Energy, Power, Control and Networks (EPCN) 9/2020–8/2023
 “Modeling and Control of Coevolutionary Network Formation with Applications to Finishing Processes for 3D Printed Components”, Role: **PI**, CoPIs: Satish Bukkapatnam,

\$430,000**T3 Texas A&M**

1/2020-1/2022

“Understanding individual behavior and value of social network information during the flu season”, Role: **PI**, CoPIs: Martial Ndeffo Mbah, Alexander Brown, **\$30,000**

Innovation [X] School of Innovation and Office of Diversity, Texas A&M 2020-2021

“Effective Communication Strategies During Covid-19”, Role: **Co-PI**, PI: C. Lakimsetti, Co-PIs: E. Amaral, E. Santana, D. Over, M. Perez-Patron, **\$20,000**

INTERNSHIP

NEC Laboratories America Inc.

Cupertino, CA

Energy Department Research Intern

May 2014 - August 2014

Projects: Decentralized energy management systems with storage and renewables.

ADVISEES

- *Hossein Khazaei*, Postdoctoral Researcher (co-advised with Alfredo Garcia), Texas A&M, TX, Fall 2020–Summer 2021
- *Roohallah Khatami*, Postdoctoral Researcher (co-advised with Alfredo Garcia), Texas A&M, TX, Fall 2019–Spring 2020.

PhD Students:

- *Soham Das*, PhD Candidate, Texas A&M, TX, Fall 2020–present
- *Sarper Aydin*, PhD Candidate, Texas A&M, TX, Fall 2019–present
- *Furkan Sezer*, PhD Candidate, Texas A&M, TX, Fall 2019–present

Graduate Students:

- Francisco Donoso, ISEN Masters Texas A&M, Spring 2021–present
- Soham Das, ISEN Masters Texas A&M, Spring 2020–Summer 2020

Undergraduate:

- Daniel Guerson, ECE Texas A&M, Spring 2020–present
- Francisco Donoso, ISEN Texas A&M, Spring 2020-Fall 2020
- *Capstone:* Luke Shafik, Shayne Jayawardene, Preston Crow, Byron Barthelemy, Spring 2019
- *Capstone:* Ian McNelis, Hudson Surjana, Natasha Surjana, Alberto Maldonado, Alexa Gutierrez - (**Best Project**), Fall 2018
- Adam B. Zhang & Brighton Ancelin, Bachelors, Georgia Tech, GA, Spring 2017, *Supervised project:* A network data repository for epidemics models–**Best presentation in the Undergraduate Symposium at Georgia Tech**
- Keith Paarporn, ECE, Ph.D. candidate, Georgia Tech, Fall 2016-Spring 2017, *Supervised project:* Global coordination games
- Walker Gussler, Biology, Masters, Georgia Tech, GA, Fall 2016, *Supervised project:* Pitfalls in disease forecasting: effects of behavior and networks
- Adam B. Zhang, Applied Mathematics, Bachelors, Georgia Tech, GA, Fall 2016, *Supervised project:* Networked SIS epidemics with awareness - empirical networks
- Keith Paarporn, ECE, Masters, Georgia Tech, GA, Fall 2015 - Spring 2016, *Supervised project:* Networked SIS epidemics with awareness

TEACHING EXPERIENCE

Instructor for “ISEN 613 - Engineering data analysis” , Texas A&M

Spring 2021

Instructor for “ISEN 320 - Operations Research I”, Texas A&M

Fall 2020

Instructor for “ISEN 613 - Engineering data analysis” , Texas A&M	Fall 2020
Co-Instructor for “ISEN 689 - Sp. Tp: Learning and Optimization over Networks”, Texas A&M	Spring 2020
Instructor for “ISEN 613 - Engineering data analysis” (Distance Learning Section), Texas A&M	Spring 2020
Instructor for “ISEN 613 - Engineering data analysis” (Distance Learning Section), Texas A&M	Fall 2019
Instructor for “ISEN 613 - Engineering data analysis”, Texas A&M	Fall 2019
Instructor for “ISEN 320 - Operations Research I”, Texas A&M	Spring 2019
Instructor for “ISEN 613 - Engineering data analysis”, Texas A&M	Fall 2018
Teaching assistant for “Systems Methodology”, Univ. of Pennsylvania	Spring 2011
Teaching assistant for “Agent Based Modeling”, Univ. of Pennsylvania	Fall 2010
Teaching assistant for “Agent Based Modeling”, Univ. of Pennsylvania	Fall 2009

INVITED PRESENTATIONS

- *Communication-Aware and Decentralized Strategic Learning in Networked Multiagent Systems*
Ins. Data Science, Texas A&M University (Fall 2021)
- *Communication-Aware Decentralized Game-Theoretic Learning Algorithms for Networked Systems with Uncertainty*
Department of Electrical and Computer Engineering Engineering, University of Central Florida (Spring 2021)
- *Communication-Aware Decentralized Game-Theoretic Learning Algorithms for Networked Systems with Uncertainty*
Department of Industrial Engineering, University of Pittsburgh (Spring 2021)
- *Optimal Control for Evolutionary Dynamics*
Bio-Group Seminar, Texas A&M ECE (2020)
- *Learning and Influence in Networked Multiagent Systems with Uncertainty*
Universidad Rey Juan Carlos ECE, Madrid, Spain (2019)
- *Learning networked multiagent systems with uncertainty*
Texas A&M ECE (2018)
- *Decision making in networked multiagent systems with uncertainty*
Faculty of Math and Sciences - Groningen University (January 2017), Industrial and Systems Engineering - University of Florida (March 2017), Electrical Engineering - University of Hawaii (April 2017), Industrial and Systems Engineering - Texas A&M (May 2017)
- *Networked multiagent systems with uncertainty*
Sabancı University (April 2016), Boğaziçi University (May 2016).
- *Disease dynamics on a network game*
UPenn (April 2016), Yale Inst. Network Science (2017), University of Stuttgart (2018)
- *Multiagent systems with uncertainty: Infectious disease dynamics over networks*
Bilkent University (Dec. 2015), Boğaziçi University (Jan. 2016).
- *Bayesian network games approach to demand response management in smart grids*
Power and Energy Systems Group at UIUC, (May 2014).
- *Bayesian network games*
Sabancı University (Dec. 2013), Koç University (Dec. 2013), Boğaziçi University (Dec. 2013), Princeton (April 2014).
- *Network optimization with heuristic rational agents*
Penn Seminar on Communications and Networking, UPenn (Oct. 2011).

PROFESSIONAL AFFILIATIONS AND REVIEW ACTIVITIES

- IEEE Member, IEEE Control Systems and Signal Processing Societies Member, INFORMS.
- **Editor:** PLOS ONE - Complex Networks Channel
- **Reviewer for Journals:** IEEE Trans. Automatic Control, Automatica, IEEE Trans. Control Systems Technology, Control Systems Letters, IEEE Trans. Signal Process., Signal Process. Letters, IEEE Trans. Signal and Information Process. over Networks, IEEE Journal Sel. Topics in Signal Process., IEEE Trans. Smart Grids, Operations Research, System Dynamics Review, Theoretical Biology, INFORMS Journal Computing, Optimization Letters.
- **Reviewer for Conferences:** Int. Conf. Acoustics, Speech, Signal Process., IEEE Conf. Decision and Control, IEEE Global Conf. on Signal and Inf. Process., IEEE Conf. on Decision and Control (CDC), American Control Conf. (ACC), GAMENETS.
- **Invited session organizer:**
 - 'Multiagent Systems and Game Theory' at the Asilomar Conference on Signals, Systems, and Computers, 2016
 - 'Network Games' at the Asilomar Conference on Signals, Systems, and Computers, 2018
 - 'Game Theoretic Learning over Networks' at the Asilomar Conference on Signals, Systems, and Computers, 2019
 - 'Game Theoretic Learning in Networks' at the INFORMS Annual Meeting – Optimization track, 2020.