

Yagiz Savas

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Research interests My research aims to build autonomous systems that co-exist, cooperate, and compete with other such systems with verifiable safety and security guarantees. To this end, I develop theoretical and computational methods by combining tools from diverse fields such as control theory, formal methods, and information theory.

Education **The University of Texas at Austin, TX, USA** 2017- Spring 2022
Ph.D. in Aerospace Engineering
Advisor: Ufuk Topcu

The University of Texas at Austin, TX, USA 2017-2019
M.S. in Aerospace Engineering

Bogazici University, Istanbul, Turkey 2011-2017
B.S. in Mechanical Engineering

University of Southern Denmark, Odense, Denmark 2014-2015
One semester Erasmus exchange program

Journal articles

* indicates equal contribution

- [1] **On the Detection of Markov Decision Processes**
X. Duan, **Y. Savas**, R. Yan, Z. Xu, U. Topcu.
IEEE Transactions on Information Theory, 2021. (under review)
- [2] **No-Regret Learning in Dynamic Stackelberg Games**
N. Lauffer, M. Ghasemi, A. Hashemi, **Y. Savas**, U. Topcu.
IEEE Transactions on Automatic Control, 2021. (under review)
- [3] **Collaborative Beamforming Under Localization Errors: A Discrete Optimization Approach**
Y. Savas*, E. Noorani*, A. Koppel, J. Baras, U. Topcu, B. M. Sadler.
Signal Processing, 2021. (under review)
- [4] **Entropy Maximization for Partially Observable Markov Decision Processes**
Y. Savas*, M. Hibbard*, B. Wu, T. Tanaka, and U. Topcu.
IEEE Transactions on Automatic Control, 2021. (accepted)
- [5] **On the Complexity of Sequential Incentive Design**
Y. Savas, V. Gupta, U. Topcu.
IEEE Transactions on Automatic Control, 2021. (accepted)
- [6] **On Minimizing Total Discounted Cost in MDPs Subject to Reachability Constraints**
Y. Savas, C. K. Verginis, M. Hibbard, and U. Topcu.
IEEE Transactions on Automatic Control, 2021. (accepted)

- [7] **Design, Implementation, and Evaluation of a Backstepping Control Algorithm for an Active Ankle–Foot Orthosis**
O. Kirtas, **Y. Savas**, M. Bayraker, F. Baskaya, H. Basturk, and E. Samur.
Control Engineering Practice, vol. 106, 2021.

- [8] **Entropy Maximization for Markov Decision Processes Under Temporal Logic Constraints**
Y. Savas, M. Ornik, M. Cubuktepe, M. O. Karabag, and U. Topcu.
IEEE Transactions on Automatic Control, vol. 65, no. 4, pp. 1552–1567, 2019.

Conference
articles
(peer-reviewed)

- [1] **Deceptive Decision-Making Under Uncertainty**
Y. Savas, C. K. Verginis, U. Topcu.
AAAI Conference on Artificial Intelligence, 2021. (accepted)
- [2] **Optimal Routing in Stochastic Networks with Reliability Guarantees**
W. Zheng, P. Thangeda, **Y. Savas**, M. Ornik.
IEEE International Conference on Intelligent Transportation Systems, pp. 3521–3526, 2021.
- [3] **Collaborative Beamforming for Agents with Localization Errors**
E. Noorani*, **Y. Savas***, A. Koppel, J. Baras, U. Topcu, B. M. Sadler.
Asilomar Conference on Signals, Systems and Computers, 2021. (accepted)
- [4] **Physical-Layer Security via Distributed Beamforming in the Presence of Adversaries with Unknown Location**
Y. Savas, A. Hashemi, A. P. Vinod, B. M. Sadler, and U. Topcu.
International Conference on Acoustics, Speech, and Signal Processing, pp. 4685–4689, 2021.
- [5] **Minimizing the Information Leakage Regarding High-Level Task Specifications**
M. Hibbard* , **Y. Savas***, Z. Xu, and U. Topcu.
IFAC World Congress, vol. 53, no. 2, pp. 15388–15395, 2020.
- [6] **Unpredictable Planning Under Partial Observability**
M. Hibbard , **Y. Savas**, B. Wu, T. Tanaka, and U. Topcu.
IEEE Conference on Decision and Control, pp. 2271–2277, 2019.
- [7] **Entropy-Regularized Stochastic Games**
Y. Savas, M. Ahmadi, T. Tanaka, and U. Topcu.
IEEE Conference on Decision and Control, pp. 5955–5962, 2019.
- [8] **Incentive Design for Temporal Logic Objectives**
Y. Savas, V. Gupta, M. Ornik, L. J. Ratliff, and U. Topcu.
IEEE Conference on Decision and Control, pp. 2251–2258, 2019.
- [9] **Entropy Maximization for Constrained Markov Decision Processes**
Y. Savas, M. Ornik, M. Cubuktepe, and U. Topcu.
Allerton Conference on Communication, Control, and Computing, pp. 911–918, 2018.
- [10] **A Backstepping Control Design for an Active Ankle-Foot Orthosis**
Y. Savas, O. Kirtas, H. I. Basturk, and E. Samur.
IEEE Conference on Decision and Control, pp. 262–267, 2017.

- [11] **Adaptive Backstepping Control Design for Active Suspension Systems Actuated by Four-Way Valve-Piston**
Y. Savas, H. I. Basturk.
American Control Conference, pp. 438-443, 2017.

Research experience	The University of Texas at Austin, TX, USA	2017- Present
	<i>Graduate Research Assistant</i>	
	Developing theory and algorithms for autonomous systems to safely co-exist with humans, effectively cooperate with friends, and successfully compete with adversaries.	
	U.S. Army Research Laboratory, MD, USA	Summer 2019
	<i>Research Intern</i>	
	Worked on wireless communication systems with an emphasis on distributed beam-forming techniques.	
	Bogazici University, Istanbul, Turkey	2016- 2017
	<i>Undergraduate Student Researcher</i>	
	Worked on adaptive controller design of an active ankle-foot orthosis and an active suspension system.	
Teaching experience	The University of Texas at Austin, TX, USA	Fall 2020, Fall 2021
	<i>Teaching Assistant – ASE370C: Feedback Control Systems</i>	
	Prepared homework questions, and held office and recitation hours.	
Selected talks	Deceptive Decision-Making Against Adversaries	November 2021
	<i>AFOSR Center of Excellence in Assured Autonomy in Contested Environments</i>	
	Manipulative Decision-Making: Complexity and Algorithms	May 2021
	<i>AFOSR Center of Excellence in Assured Autonomy in Contested Environments</i>	
	Autonomous Planning While Protecting Critical Information	December 2020
	<i>Texas Robotics Symposium</i>	
	Distributed Beamforming in Adversarial Environments	October 2020
	<i>AFOSR Center of Excellence in Assured Autonomy in Contested Environments</i>	
	Entropy Maximization for Markov Decision Processes	July 2019
	<i>U.S. Army Research Laboratory</i>	
	Entropy Maximization for Markov Decision Processes	April 2019
	<i>University of Illinois Urbana-Champaign</i>	
Service	Workshop on Learning and Control for Safety-Critical Systems	May 2022
	<i>Co-organizer, American Control Conference (under review)</i>	
	Reviewer	
	IEEE Transactions on Automatic Control	2021
	Automatica	2021
	IEEE Transactions on Robotics	2020, 2021
	IEEE International Conference on Automation Science and Engineering	2021
	American Control Conference	2017, 2020, 2021
	International Conference on Computer-Aided Verification	2019
	IEEE Conference on Decision and Control	2019