Augustinos D. Saravanos

Postdoctoral Associate
Department of Aeronautics and Astronautics
Massachusetts Institute of Technology (MIT)
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Personal

Website | Google Scholar | LinkedIn Citizenship: US, Greek

Research Interests

Optimization and Learning for Large-Scale Decision-Making

Theory: optimization, machine learning, stochastic control, robust optimization, learning-to-optimize.
Applications: multi-agent autonomy, robotics, networked systems, operations research.

Education

Georgia Institute of Technology Atlanta, GA
Ph.D. in Machine Learning 2025
Thesis: Distributed Optimization Architectures for Large-Scale Decision Making
Advisor: Prof. Evangelos A. Theodorou
Committee: Profs. Arkadi S. Nemirovski, Yao Xie, Justin Romberg, Efstathios Bakolas

Georgia Institute of Technology Atlanta, GA
M.Sc. in Aerospace Engineering 2024

University of Patras Patras, Greece
Diploma in Electrical and Computer Engineering 2019
Thesis: Nonlinear Model Predictive Control for Space Robotic Systems
Co-advisors: Profs. Evangelos Papadopoulos, Nick Koussoulas
Class Rank: 2nd out of 211 (top 1%), GPA: 8.77/10

Research Experience

Massachusetts Institute of Technology (MIT) Cambridge, MA
Postdoctoral Associate Aug 2025-present
Supervisor: Prof. Chuchu Fan
Focus: Foundation models for decision-making, safe reinforcement learning

Georgia Institute of Technology Atlanta, GA
Graduate Research Assistant Aug 2020-Jul 2025
Supervisor: Prof. Evangelos A. Theodorou
Focus: Distributed optimization, learning-to-optimize, large-scale decision-making

BOSCH Center for Artificial Intelligence Pittsburgh, PA
Machine Learning Research Intern May-Aug 2023
Supervisor: Dr. Wan-Yi Lin
Focus: Federated learning, model alignment

Publications

(*Equal contribution)

Books

[B1] Dynamic Optimization,
E.A. Theodorou and **A.D. Saravanos**,
In preparation, 2025.

Journal Publications

[J6] Deep Large-Scale Quadratic Optimization,
A.D. Saravanos, A. Oshin, A.T. Abdul, V. Pacelli and E.A. Theodorou,
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2025. In submission.

[J5] Distributed Covariance Steering via ADMM for Large-Scale Multi-Agent Stochastic Systems,
A.D. Saravanos, I.M. Balci, A.T. Abdul, E. Bakolas and E.A. Theodorou,
IEEE Transactions on Automatic Control (TAC), 2025. In submission.

[J4] Asynchronous Distributed Multi-Robot Motion Planning Under Imperfect Communication,
A. Tajbakhsh, **A.D. Saravanos**, J. Zhu, E.A. Theodorou, L.T. Biegler and A.M. Johnson
IEEE Robotics and Automation Letters (RA-L), 2025. In submission.

[J3] Scaling Robust Optimization for Swarms: A Distributed Perspective,
A.T. Abdul*, **A.D. Saravanos*** and E.A. Theodorou,
IEEE Transactions on Automatic Control (TAC), 2025. Submitted. [Link]

[J2] Second-Order Constrained Dynamic Optimization,
Y. Aoyama, O. So, **A.D. Saravanos** and E.A. Theodorou,
International Journal of Robotics Research (IJRR), 2025. Under minor revision. [Link]

[J1] Distributed Differential Dynamic Programming Architectures for Large-Scale Multi-Agent Control,
A.D. Saravanos, Y. Aoyama, H. Zhu and E.A. Theodorou,
IEEE Transactions on Robotics (T-RO), 2023. [Link] [Video]

Conference Publications

[C14] Deep FlexQP: Accelerated Nonlinear Programming via Deep Unfolding,
A. Oshin, R. Ghosh, **A.D. Saravanos** and E.A. Theodorou,
International Conference on Learning Representations (ICLR), 2026. Submitted.

[C13] Distributed Stochastic Search for Multi-Agent Model Predictive Control,
T. Yoon, **A.D. Saravanos** and E.A. Theodorou,
American Control Conference (ACC), 2026. Submitted.

[C12] Momentum Multi-Marginal Schrödinger Bridge Matching,
P. Theodoropoulos, **A.D. Saravanos**, E.A. Theodorou and G.H. Liu,
Neural Information Processing Systems (NeurIPS) 2025. [Link]

[C11] Nonlinear Robust Optimization for Planning and Control,
A.T. Abdul, **A.D. Saravanos** and E.A. Theodorou,
IEEE Conference on Decision and Control (CDC), 2025. [Link]

[C10] Operator Splitting Covariance Steering for Safe Stochastic Nonlinear Control,
A. Ratheesh, V. Pacelli, **A.D. Saravanos** and E.A. Theodorou,
IEEE Conference on Decision and Control (CDC), 2025. [Link] [Video]

[C9] Deep Distributed Optimization for Large-Scale Quadratic Programming,
A.D. Saravanos, H. Kuperman, A. Oshin, A.T. Abdul, V. Pacelli and E.A. Theodorou,
International Conference on Learning Representations (ICLR), 2025. [Link]

[C8] Scalable Robust Optimization for Safe Multi-Agent Control Under Unknown Deterministic Uncertainty,
A.T. Abdul*, **A.D. Saravanos*** and E.A. Theodorou,
American Control Conference (ACC), 2025. [Link]

[C7] Distributed Model Predictive Covariance Steering,
A.D. Saravanos, I.M. Balci, E. Bakolas, E.A. Theodorou,
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024. [Link] [Video]

[C6] A Robust Differential Neural ODE Optimizer,
P. Theodoropoulos, G.H. Liu, T. Chen, **A.D. Saravanos** and E.A. Theodorou,
International Conference on Learning Representations (ICLR), 2024. [Link]

[C5] Distributed Hierarchical Distribution Control for Very-Large-Scale Clustered Multi-Agent Systems,
A.D. Saravanos, Y. Li and E.A. Theodorou,
Robotics: Science and Systems (RSS), 2023. [Link] [Video]

[C4] Improved Exploration for Safety-Embedded Differential Dynamic Programming Using Tolerant Barrier States,
J.E. Kuperman, H. Almubarak, **A.D. Saravanos** and E.A. Theodorou,
International Conference on Advanced Robotics (ICAR), 2023. [Link] [Video]

[C3] Decentralized Safe Multi-Agent Stochastic Optimal Control using Deep FBSDEs and ADMM,
M.A. Pereira*, **A.D. Saravanos***, O. So and E.A. Theodorou,
Robotics: Science and Systems (RSS), 2022. [Link] [Video]

[C2] Receding Horizon Differential Dynamic Programming Under Parametric Uncertainty,
Y. Aoyama, **A.D. Saravanos** and E.A. Theodorou,
IEEE Conference on Decision and Control (CDC), 2021. [Link]

[C1] Distributed Covariance Steering with Consensus ADMM for Stochastic Multi-Agent Systems,
A.D. Saravanos, A.G. Tsolovikos, E. Bakolas and E.A. Theodorou,
Robotics: Science and Systems (RSS), 2021. [Link]

Workshop Papers / Technical Reports

[O2] Sim2Real on the Robotarium Platform Using Decentralized Multi-Agent Safe Deep FBSDEs,
M.A. Pereira*, **A.D. Saravanos***, E.A. Theodorou,
Robotics: Science and Systems (RSS), Workshop on Scaling Robot Learning, 2022.
[Link] [Video 1] [Video 2]

[O1] Sampling-Based Optimization for Multi-Agent Model Predictive Control,
Z. Wang, **A.D. Saravanos**, H. Almubarak, O. So, E.A. Theodorou,
Technical Report, 2022. [Link] [Video]

Theses

[T2] Distributed Optimization Architectures for Large-Scale Decision-Making,
A.D. Saravanos
Ph.D. Thesis, Georgia Institute of Technology, 2025.

[T1] Nonlinear Model Predictive Control for Space Robotic Systems,
A.D. Saravanos
Diploma Thesis, University of Patras, 2019.

Patents

[P3] Collaborative learning with full model alignment — Sep 2023
A.D. Saravanos, F.J. Cabrita Condessa, W.-Y. Lin, Z. Li and M.R. Ganesh
U.S. Patent Application No. 18/371,596. [Link]

[P2] Collaborative learning with full model alignment — Sep 2023
A.D. Saravanos, F.J. Cabrita Condessa, W.-Y. Lin, Z. Li and M.R. Ganesh
U.S. Patent Application No. 18/371,594. [Link]

[P1] Collaborative learning with full model alignment — Sep 2023
A.D. Saravanos, F.J. Cabrita Condessa, W.-Y. Lin, Z. Li and M.R. Ganesh
U.S. Patent Application No. 18/371,587. [Link]

Fellowships/Awards

Onassis Foundation Scholar - Doctoral Fellowship — 2021-2025
Four-year award for PhD studies financial support

Gerondelis Foundation - Doctoral Fellowship — 2022
One-time award for PhD studies financial support

Skouras Foundation Scholarship — 2019
Top ECE student and in top 10 students of University of Patras for academic year 2018-19

Valedictorian, Class of 2019, December Graduation Ceremony, ECE, University of Patras — 2019

1st & 2nd places, Line Following Robots (Enhanced), Robotex International 2018, Estonia — 2018

3rd place, Line Following Robots (Enhanced), Robotex International 2017, Estonia — 2017

Bronze medal, European Science Olympiad (EUSO) 2013, Luxembourg — 2013

Gold medal, National Science Olympiad 2013, Greece — 2013

Peer Review Service

Journals: IEEE Transactions on Robotics (T-RO); IEEE Transactions on Automatic Control (TAC); IEEE Transactions on Systems, Man and Cybernetics; IEEE Control Systems Letters (L-CSS); International Journal of Robust and Nonlinear Control

Conferences: International Conference on Learning Representations (ICLR); International Conference on Machine Learning (ICML); Robotics: Science and Systems (RSS); IEEE International Conference on Robotics and Automation (ICRA); International Conference on Intelligent Robots and Systems (IROS); IEEE Conference on Decision and Control (CDC); American Control Conference (ACC); International Conference on Advanced Robotics (ICAR)

Teaching and Mentoring

Teaching

Guest Lecturer at Motion Planning RBE 550, Worcester Polytechnic Institute (WPI) — Fall 2025
Lecture title: "Towards Large-Scale Autonomy: Multi-Agent Planning and Control"

Volunteer teacher, Robots at MET Program, University of Patras, Greece — 2018-2020
Taught teams of elementary school students on LEGO robotics

TISP (Teacher In-Service Program) Volunteer, IEEE Student Branch, University of Patras — 2016-2020
Taught elementary school students basic concepts in engineering

Volunteering course coordinator at "Skagiopouleio" Orphanage, Patras, Greece — May 2017
Organized "Introduction to Coding" course for elementary school students

Mentoring/Supervising

Dami Thomas, UROP (Undergraduate Research Opportunities Program) at MIT — Fall 2025
Research topic: Safe multi-agent control for autonomous field inspection robots

Arshiya Taj Abdul, MS/PhD student at Georgia Tech — 2022-2025
Research topic: Distributed robust optimization for multi-agent control under uncertainty
Resulted into 1 ACC '25, 1 CDC '25 and 1 TAC (under review) publications.

Panagiotis Theodoropoulos, PhD student at Georgia Tech — 2022-2025
Research topic: Stochastic optimal control and generative AI
Resulted into 1 ICLR '24 and 1 NeurIPS '25 publications.

Akash Ratheesh, PhD student at Georgia Tech — 2023-2025
Research topic: Operator splitting covariance steering for safe stochastic nonlinear control
Resulted into 1 CDC '25 publication.

Taehyun Yoon, PhD student at Georgia Tech — 2024-2025
Research topic: Distributed trajectory optimization for multi-agent systems
Resulted into 1 ACC '26 (under review) publication.

Joshua Kuperman, MS student at Georgia Tech — 2022-2023
Research topic: Tolerant barrier states for safe trajectory optimization
Resulted into 1 ICAR '23 publication.

Technical Skills

Coding Languages:	Python, C/C++, MATLAB, Julia
Packages:	PyTorch, Scikit-learn, NumPy, CVX/CVXPY, MOSEK, Gurobi
IDEs:	Visual Studio, Jupyter Notebook, PyCharm, Spyder

Languages

English (Fluent), Greek (Native), French (Advanced)

References

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