Augustinos D. Saravanos

Postdoctoral Associate
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Personal

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Research Interests

Scalable and Reliable Autonomy: At the Intersection of AI and Optimization

Theory: large-scale optimization, (stochastic) optimal control, learning-to-optimize, generative modeling
Applications: multi-agent autonomy, robotics, transportation, 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

Experience

Massachusetts Institute of Technology (MIT) Cambridge, MA
Postdoctoral Associate Aug 2025-present
Supervisor: Prof. Chuchu Fan
Focus: Generative AI for optimization, decision-making and autonomy

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

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

Publications

([*]Equal contribution, [†]Equal advising)

Journal Publications

[J5] Second-Order Constrained Dynamic Optimization,
Y. Aoyama, O. So, **A.D. Saravanos** and E.A. Theodorou,
International Journal of Robotics Research (IJRR), 2026.

[J4] Distributed Covariance Steering via Non-Convex ADMM for Large-Scale Multi-Agent Systems,
A.D. Saravanos, I.M. Balci[*], A.T. Abdul[*], E. Bakolas and E.A. Theodorou,
IEEE Transactions on Automatic Control (TAC), 2026. Under review.

[J3] 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. Under review.

[J2] 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. Under review.

[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.

Conference Publications

[C14] Learning-to-Optimize via Deep Unfolded Flows,
A.D. Saravanos, O. So, H.M. Sabbir Ahmad and C. Fan,
International Conference on Machine Learning (ICML), 2026. Spotlight (top 2%).

[C13] 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.

[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.

[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.

[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.

[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.

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

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

[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.

[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.

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

[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.

[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.

[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.

Workshop Papers / Technical Reports

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

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

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 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.

[P2] Collaborative learning with full model alignment 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.

[P1] Collaborative learning with full model alignment 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.

Grant Writing

[G1] Safety Guarantees and Stability Verification for End-to-End Autonomous Driving Models 2026
Hyundai Motor Group (HMG), Project Manager: Dr. Yong-suk Kang
Amount: $70,000 (May-Nov 2026)
Role: Lead author (PI: Prof. Chuchu Fan, MIT)

Awards/Fellowships

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

Invited Talks

2026 INFORMS Optimization Society Conference, Computational Optimization Track Mar 2026
Topic: Deep Learning-Aided Large-Scale Distributed Optimization

JST ASPIRE Meeting Mar 2026
Topic: Learning-to-Optimize via Generative Modeling

Worcester Polytechnic Institute - Robotics Engineering, Guest Lecture Nov 2025
Topic: Towards Large-Scale Autonomy: Multi-Agent Planning and Control

Mentorship/Supervision

Graduate Students

Ollie Zhang, MS Student at MIT Spring 2026-present
Research topic: Multi-agent planning and control

Carson Sobolewski, PhD Student at MIT 2025-present
Research topic: Safe multi-agent control for autonomous field inspection robots

Arshiya Taj Abdul, MS/Junior PhD student at Georgia Tech 2023-2025
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, Junior PhD student at Georgia Tech 2023-2025
Research topic: Stochastic optimal control and generative AI
Resulted into 1 ICLR '24 and 1 NeurIPS '25 publications.

Akash Ratheesh, Junior 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, Junior PhD student at Georgia Tech 2024-2025
Research topic: Distributed trajectory optimization for multi-agent systems
Resulted into an upcoming CDC '26 submission.

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

Undergraduate Students

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

Hunter Kuperman, BS Student at Georgia Tech Spring-Fall 2024
Research topic: Learning-to-optimize for quadratic programming

Teaching

Guest Lecturer at Feedback Control Systems 16.30/31, MIT Dec 2025
Lecture title: "Advanced Topics: Optimal Control and Lyapunov Analysis"

Guest Lecturer at Motion Planning RBE 550, Worcester Polytechnic Institute (WPI) Nov 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

Peer Review Service

Journals: T-RO, TAC, TCNS, RA-L, L-CSS, IJRNC, TSMC.

Conferences: RSS, ICRA, IROS, ICLR, ICML, NeurIPS, L4DC, CDC, ACC, ECC, ICAR, IASEAI.

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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