

Andreas A. Malikopoulos

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RESEARCH INTERESTS

Analysis, optimization and control of complex systems; decentralized stochastic systems; stochastic scheduling and resource allocation; nonlinear optimization and convex analysis; large-scale optimization; learning in complex systems; connected and automated vehicles; energy and sustainable systems; off-grid buildings; and automotive technologies.

TEACHING INTERESTS

Decision making in large-scale systems; stochastic optimal control; modeling dynamics and control; analysis and design of feedback control systems; intelligent control; linear and nonlinear system theory; game theory; mechanism design; engineering systems analysis for design optimization; and intelligent transportation systems.

EDUCATION

Ph.D. Mechanical Engineering, University of Michigan, 2008.

Dissertation: *Real-Time, Self-Learning Identification and Stochastic Optimal Control of Advanced Powertrain Systems.*

M.S. Mechanical Engineering, University of Michigan, 2004.

Project: *Simulation of an Integrated Starter Alternator (ISA) System for the HMMWV.*

Diploma Mechanical Engineering, National Technical University of Athens (NTUA), Greece, 2000.

Senior Thesis Title: *Design and Resin Flow Simulation of a Plastic Storing Case for Computer Disks – Design and Manufacturing of Injection Mold for the Production of the Plastic Case.*

B.S. Mechanical Engineering, Technological Educational Institute of Patras, Greece, 1994.

Senior Thesis Title: *Development and Analysis of Optimization Algorithms for Product Design.*

EXPERIENCE

Oak Ridge National Laboratory
Deputy Director, Urban Dynamics Institute
Knoxville, TN
January 2014-present
Leading ORNL efforts on connected and automated vehicles (CAVs). Developed a new initiative with the goal to investigate the use of scalable data and informatics to enhance understanding of the environmental implications of CAVs and improving transportation sustainability and accessibility.

Oak Ridge National Laboratory, Energy & Transportation Science Division
R&D Staff, Alvin M. Weinberg Fellow
Knoxville, TN
November 2012-present
Developing the theory and algorithms for optimization and control of intelligent systems. Current applications include:

- Intelligent vehicles with the aim of (1) becoming eco-friendly and operating at zero-based emissions, (2) realizing the optimum performance and efficiency based on consumers' needs and preferences, (3) learning how traffic information can positively impact considerations of the environment, traffic safety and traffic congestion, and (4) analyzing the driver's intention and watching his/her physical status for any impairments or information overload.
- Smart buildings that will aim to optimize energy system parameters to improve sustainability, facilitate cost-effective energy generation, and allocate demand optimally to different energy sources, e.g., solar, renewable, etc.

Oak Ridge National Laboratory, Energy & Transportation Science Division
R&D Associate, Alvin M. Weinberg Fellow
Knoxville, TN
November 2010-October 2012
Established a rigorous mathematical framework; formulated numerical algorithms; and conducted a qualitative assessment on deriving an optimal solution for the analysis and stochastic optimization of large-scale complex systems in applications related to energy and transportation.

General Motors, Research & Development Center
Senior Researcher
Warren, MI
February 2010- August 2010
Lead in autonomous intelligent propulsion systems and transportation. Developed computational mathematical models in optimization and control towards making highly energy-efficient and eco-friendly vehicles.

General Motors, Research & Development Center
Researcher
Warren, MI
June 2008-January 2010
Conducted research in the area of optimization, stochastic control, and hybrid systems with an emphasis on applications to advanced propulsion systems. Implemented control learning algorithms for the HCCI demo vehicles- Saturn Aura and Opel Vectra.

University of Michigan, Mechanical Engineering
Postdoctoral Research Fellow
Ann Arbor, MI
January 2008-May 2008
Conducted a study in advanced learning control models with an emphasis on applications to Homogeneous Charge Compression Ignition (HCCI) engines.

General Motors, Research & Development Center
Graduate Student Intern
Warren, MI
June 2005-September 2005
Worked on propulsion modeling and control design; supported simulation-based and model-based analysis of various control algorithms for multivariable control of Compression Ignition Direct Injection (CIDI) engines and confirmed accordance of the full-authority engine control model developed by the R&D diesel control research team.

University of Michigan, Mechanical Engineering
Graduate Student Research Assistant
Ann Arbor, MI
January 2003-December 2007
Participated in a number of research projects of the Automotive Research Center (ARC), the National Automotive Center (NAC), the U.S. Army Tank-Automotive Research, Development and Engineering Center (TARDEC), and the General Dynamics Land Systems (GDLS).

- Developed the theory and mathematical learning algorithms that make the engine of a vehicle into an autonomous intelligent system able to learn its optimal operation in real time with respect to the driver's driving style.
- Implemented optimal cooling system design for a heavy-duty off-road vehicle with a series electric hybrid powertrain.
- Developed a real-time power management control algorithm for a mild hybrid High Mobility Multi-purpose Wheeled Vehicle (HMMWV).

National Technical University of Athens (NTUA), Mechanical Engineering
Research Assistant
Athens, Greece
May 2002-December 2002

Implemented an innovative design of a composite bicycle frame using finite element analysis utilizing I-Deas. The RTM simulation tool was used for the resin injection into the mold with a preplaced fiber preform.

University of Delaware, Center of Composite Materials (CCM) Newark, DE
Research Assistant August 2001- April 2002
Conducted an extensive experimental program to assess structural performance of the HMMWV hood. Vehicle crash loads on the hood were simulated by use of a special telescopic test frame that allowed investigation of buckling loads and modes.

Intracom SA, Technical Operation Division Athens, Greece
Product Designer April 2000-July 2001
Designed and studied the car parking meter (SPARK 100) and the solar telephone booth. Designated the aesthetic product design and performed finite element analysis of the static and dynamic outdoor requirements. Performed optimization of the assembly steps.

National Technical University of Athens (NTUA), Mechanical Engineering Athens, Greece
Undergraduate Research Opportunity Program November 1999 -May 2000
Studied the simulation of a gas-assisted injection molded part using C-Mold software. A test mold for a commercial product was constructed and the simulated results were compared to the real outcome of each injection strategy.

Hellenic Navy, Fleet Headquarters Salamina, Greece
Analyst July 1998-April 2000
Developed software applications and provided computer support of the Hellenic ministry system hardware. System administrator and responsible of network maintenance of the Hellenic navy.

Intracom SA, Technical Operation Division Athens, Greece
Undergraduate Student Intern September 1993-June 1994
Trained in computer aided design software I-Deas, Pro-Engineer, and AutoCAD. Performed structural design and finite element analysis of military communication systems, and command control systems.

ADVISING AND TEACHING EXPERIENCE

Served Ph.D. Dissertation Committees

- Mohamed L. Shaltout, *Optimal Control of Wind Turbines for Microgrid Applications*, Ph.D in Mechanical Engineering, University of Texas, Austin, July, 2015.
- Michael E. Cholette, *Performance Monitoring and Fault-Tolerant Control of Complex Systems with Variable Operating Conditions*, Ph.D in Mechanical Engineering, University of Texas, Austin, July, 2012.

Served Committees for M.S. Thesis

- Yang Shen, *On Decision Making: Bayesian and Stochastic Optimization Approaches*, M.S., Department of Mathematics, University of Tennessee, Knoxville, November, 2012.

Mentored graduate students at Oak Ridge National Laboratory

- Yue Joyce Zhang May 2015-August 2015
Ph.D Candidate Electrical & Computer Engineering, Boston University, Boston
- Jackeline Rios-Torres September 2014-August 2015
Ph.D Candidate Automotive Engineering, Clemson University, Clemson

- Erik Miebling
Ph.D Candidate
June 2013-August 2013
Electrical & Computer Engineering, University of Michigan, Ann Arbor
- Mohamed L. Shaltout
Ph.D Candidate
June 2013-August 2013
Mechanical Engineering, University of Texas, Austin
- Yang Shen
M.S. Candidate
May 2012-August 2012
Department of Mathematics, University of Tennessee, Knoxville
- Sherrill Toran
M.S. Candidate
June 2012-August 2012
Department of Mathematics, Tennessee State University, Nashville
- Zachary A. Henderson
B.S. Candidate
June 2012-August 2012
Mechanical Engineering, Tennessee Tech University, Cookeville
- Michael E. Cholette
Ph.D Candidate
May 2011-August 2011
Mechanical Engineering, University of Texas, Austin
- Juan P. Aguilar
M.S. Candidate
May 2011-July 2011
Mechanical Engineering, Georgia Institute of Technology

General Motors, Research & Development Center
Mentor
Warren, MI
May 2009-August 2010
Advising graduate intern students conducting research in the area of stochastic and adaptive control, hybrid systems, and artificial intelligence with applications to advanced propulsion systems.

University of Michigan,
Assistant Instructor
Ann Arbor, MI
January 2008-April 2008
AUTO 599 (Prof. Dennis Assanis), graduate course on Analysis and Control of Alternative Powertrains. Assisted in teaching this class, held office hours, and graded homework assignments.

University of Michigan,
Graduate Student Instructor
Ann Arbor, MI
January 2005-April 2007
ME 555 (Prof. Panos Papalambros), graduate course on Design Optimization. Assisted in teaching this class, held office hours, advised student design projects, and graded homework assignments.

University of Michigan, Undergraduate Research Opportunity Program (UROP)
Graduate Student Mentor
Ann Arbor, MI
September 2005-April 2006
Assisted undergraduate students with individual research projects related to hybrid-electric vehicles. Tutored Matlab/Simulink, Design Optimization, Internal Combustion Engines and Automatic Control material.

National Technical University of Athens (NTUA), Mechanical Engineering
Instructor
Athens, Greece
September 2002-December 2002
Taught and advised the “Computer Aided Design and Manufacturing” graduate level course. Developed new course material and restructured the syllabus. Initiated and supported interdisciplinary student coursework and project interaction. Assisted students individually with homework problems or material they found difficult to understand. Presented a series of product design examples through I-Deas.

Intracom Corp., Technical Operation Division
Internship Supervisor
Athens, Greece
April 2000-July 2001
Mentored and supervised undergraduate summer intern students in engineering design and I-Deas software.

PUBLICATIONS

Books:

1. **Malikopoulos, A.A.** *Real-Time, Self-Learning Identification and Stochastic Optimal Control of Advanced Powertrain Systems*, ProQuest, September 2011.

Journal Articles (in Review):

1. **Malikopoulos, A.A.**, "A Duality Framework for Stochastic Optimal Control of Complex Systems," *IEEE Transactions on Automatic Control*, arXiv: 1506.03417. (*conditionally accepted*)
2. Rios-Torres, J. and **Malikopoulos, A.A.**, Pisu, P., "Coordination of Connected and Automated Vehicles for Efficient Traffic Flow," *IEEE Transactions on Intelligent Transportation Systems*. (*in review*)
3. Rios-Torres, J., **Malikopoulos, A.A.**, Pisu, P., "A Survey on Driver Feedback Systems and Coordination of Connected and Automated Vehicles," *IEEE Transactions on Intelligent Transportation Systems*. (*in review*)
4. **Malikopoulos, A.A.**, Charalambous, C.D. and Tzortzis, I., "The Average Cost of Markov Chains Subject to Total Variation Distance Uncertainty," *Systems & Control Letters*. (*in review*)

Journal Articles (Appeared or in Press):

1. **Malikopoulos, A.A.**, "A Multiobjective Optimization Framework for Online Stochastic Optimal Control in Hybrid Electric Vehicles," *IEEE Transactions on Control Systems Technology*. (*forthcoming*)
2. Shaltout, M., **Malikopoulos, A.A.**, Pannala, S., Chen, D., "A Consumer-Oriented Control Framework for Performance Analysis in Hybrid Electric Vehicles," *IEEE Transactions on Control Systems Technology*, Vol. **23**, No.4, 2015, pp. 1451-1464.
3. **Malikopoulos, A.A.**, "Supervisory Power Management Control for Hybrid Electric Vehicles: A Survey," *IEEE Transactions on Intelligent Transportation Systems*, Vol. **15**, No.5, 2014, pp. 1869-1885.
4. **Malikopoulos, A.A.** and Aguilar, J.P., "An Optimization Framework for Driver Feedback Systems," *IEEE Transactions on Intelligent Transportation Systems*, Vol. **14**, No. 2, 2013, pp.955-964.
5. **Malikopoulos, A.A.** "Impact of Component Sizing in Plug-In Hybrid Electric Vehicles for Energy Resource and Greenhouse Emissions Reduction," *J. Energy Resour. Technol*, **135**, No. 4, 2013, pp. 041201-9.
6. Park, S., **Malikopoulos, A.A.**, Kokkolaras, M. and Jung, D. "Thermal Management System Modeling and Component Sizing for Heavy Duty Series Hybrid Electric Vehicles," *Int. J. Heavy Vehicle Systems*, Vol. **18**, No. 3, 2011, pp.272-287.
7. **Malikopoulos, A.A.**, Papalambros, P.Y. and Assanis, D.N., "Online Self-Learning Identification and Stochastic Control for Autonomous Internal Combustion Engines," *J. Dyn. Sys., Meas., Control*, Vol.**132**, No. 2, 2010, pp.024504-9.
8. **Malikopoulos, A.A.**, "Convergence Properties of a Computational Learning Model for Unknown Markov Chains," *J. Dyn. Sys., Meas., Control*, Vol.**131**, No. 4, 2009, pp. 041011-7.
9. **Malikopoulos, A.A.**, Papalambros, P.Y. and Assanis, D.N., "A Real-Time Computational Learning Model for Sequential Decision-Making Problems Under Uncertainty," *J. Dyn. Sys., Meas., Control*, Vol.**131**, No. 4, 2009, pp.041010-8.
10. **Malikopoulos, A.A.**, Assanis, D.N. and Papalambros, P.Y., "Real-Time, Self-Learning Optimization of Diesel Engine Calibration," *J. Eng. Gas Turbines Power*, Vol. **131**, No. 2, 2009, pp. 022803-9.

Journal Articles (in Preparation):

1. **Malikopoulos, A.A.**, Zhang, Y.Z, Rios-Torres, J., Cassandras, C.G., “Decentralized Optimal Control for Coordination of Connected and Automated Vehicles,” indented for *IEEE Transactions on Control Systems Technology*. (working paper)
2. **Malikopoulos, A.A.**, “System-Wide Optimal Control for Transportation Systems,” indented for *IEEE Transactions on Automatic Control*. (working paper)
3. **Malikopoulos, A. A.**, “A Theoretical Framework Using Mechanism Design for Emergence in Complex Systems,” indented for *IEEE Transactions on Automatic Control*. (working paper)
4. Hong, S., **Malikopoulos, A.A.**, Lee, J., Park, B., “Development and Evaluation of Speed Harmonization Using Optimal Control Theory,” indented for *Transportation Research Part B: Methodological*. (working paper)

Peer-Reviewed Conference Publications:

1. Zhang, Y.Z, **Malikopoulos, A.A.**, Cassandras, C.G., “Optimal Control and Coordination of Connected and Automated Vehicles at Urban Traffic Intersections,” *Proceedings of the 2016 American Control Conference*, Boston, Massachusetts, July 6-8, 2016. (in review)
2. **Malikopoulos, A.A.** and Rios-Torres, J., “Decentralized Optimal Control for Vehicle Coordination at Intersections,” *Proceedings of the 2016 American Control Conference*, Boston, Massachusetts, July 6-8, 2016. (in review)
3. **Malikopoulos, A.A.**, Wei, L, Rios-Torres, J., Isukapati, I., “Decentralized Control for Coordination of Connected and Automated Vehicles at Intersection,” *Transportation Research Board (TRB) Annual Meeting*, Jan. 10-14, 2016. (in review)
4. Hong, S., **Malikopoulos, A.A.**, Lee, J., Park, B., Lu, W., “Development and Evaluation of Speed Harmonization Using Optimal Control Theory: A Simulation Based Case Study at a Speed Reduction Zone,” *Transportation Research Board (TRB) Annual Meeting*, Jan. 10-14, 2016. (in review)
5. Rios-Torres, J., **Malikopoulos, A.A.**, Pisu, P, "Online Optimal Control of Connected Vehicles for Efficient Traffic Flow at Merging Roads," in *Proceedings of 2015 IEEE 18th International Conference on Intelligent Transportation Systems, Canary Islands, Spain, September 15-18, 2015*. (to appear)
6. **Malikopoulos, A.A.**, "Pareto Efficient Policy for Supervisory Power Management Control," in *Proceedings of 2015 IEEE 18th International Conference on Intelligent Transportation Systems, Canary Islands, Spain, September 15-18, 2015*. (to appear)
7. **Malikopoulos, A.A.**, “Centralized Stochastic Optimal Control of Complex Systems” *Proceedings of the 2015 European Control Conference*, Linz, Austria, July 15-17.
8. **Malikopoulos, A.A.**, Maroulas, V., and Xiong, J. “A Multiobjective Optimization Framework for Stochastic Control of Complex Systems,” *Proceedings of the 2015 American Control Conference*, Chicago, Illinois, July 1-3, 2015.
9. Pourazarm, S., Cassandras, C.G., and **Malikopoulos, A.A.**, “Optimal Routing of Electric Vehicles in Networks with Charging Nodes: A Dynamic Programming Approach” *Proceedings of the IEEE International Electric Vehicle Conference*, Florence, Italy, December 17-19, 2014.
10. Shaltout, M., **Malikopoulos, A.A.**, Pannala, S., Chen, D., “Multi-Disciplinary Decision Making and Optimization for Hybrid Electric Propulsion Systems,” *Proceedings of the IEEE International Electric Vehicle Conference, Florence, Italy, December 17-19, 2014*.
11. **Malikopoulos, A.A.**, “Online Identification of Power Required for Self-Sustainability of the Battery in Hybrid Electric Vehicles,” *Proceedings of the 2014 Technical Conference of the ASME Internal Combustion Engine Division*, Columbus, Indiana, Oct 19-22, ICEF2014-5401, 2014.
12. **Malikopoulos, A.A.**, “Stochastic Optimal Control for Series Hybrid Electric Vehicles,” *Proceedings of 2013 American Control Conference, Washington DC, June 17-19, 2013*.
13. **Malikopoulos, A.A.** and Aguilar, J.P., “Optimization of Driving Styles for Fuel Economy Improvement,” *Proceedings of 2012 15th International IEEE Conference on Intelligent Transportation Systems*, Anchorage, AK, September 16-19, 2012.

14. **Malikopoulos, A.A.**, “Equilibrium Control Policies for Markov Chains,” *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, Florida, December 12-15, 2011.
15. **Malikopoulos, A.A.** and Smith, D.E., “An Optimization Model for Plug-in Hybrid Electric Vehicles,” *Proceedings of the 2011 Technical Conference of the ASME Internal Combustion Engine Division*, Morgantown, West Virginia, Oct 2-5, ICEF2011-60028, 2011.
16. **Malikopoulos, A.A.**, “A Lookahead Control Algorithm for Discrete-Time Stochastic Systems,” *Proceedings of the 2010 ASME Dynamic Systems and Control Conference (DSCC)*, Boston, MA, Sep. 13-15, 2010.
17. **Malikopoulos, A.A.**, “Convergence Properties of a Computational Learning Model for Unknown Markov Chains,” *Proceedings of the 2008 ASME Dynamic Systems and Control Conference (DSCC)*, Ann Arbor, MI, Oct. 20-22, DSCC2008-2174, 2008.
18. **Malikopoulos, A.A.**, Assanis, D.N. and Papalambros, P.Y., “Optimal Engine Calibration for Individual Driving Styles,” *Proceedings of the Society of Automotive Engineers World Congress*, Detroit, MI, April 14-17, SAE 2008-01-1367, 2008.
19. **Malikopoulos, A.A.**, Papalambros, P.Y. and Assanis, D.N., “A State-Space Representation Model and Learning Algorithm for Real-Time Decision-Making Under Uncertainty,” *Proceedings of the 2007 ASME International Mechanical Engineering Congress and Exposition*, Seattle, WA, Nov 11-15, IMECE2007-41258, 2007.
20. **Malikopoulos, A.A.**, Assanis, D.N. and Papalambros, P.Y., “Real-Time, Self-Learning Optimization of Diesel Engine Calibration,” *Proceedings of the 2007 Technical Conference of the ASME Internal Combustion Engine Division*, Charleston, SC, Oct 14-17, ICEF2007-1603, 2007.
21. **Malikopoulos, A.A.**, Papalambros, P.Y. and Assanis, D.N., “A Learning Algorithm for Optimal Internal Combustion Engine Calibration in Real Time,” *Proceedings of the 2007 ASME International Design Engineering Technical Conferences & Computers and Information In Engineering Conference*, Las Vegas, NV, Sep 4-7, DETC2007/DAC-34718, 2007.
22. **Malikopoulos, A.A.**, Filipi, Z. and Assanis, D.N., “Simulation of an Integrated Starter Alternator (ISA) for the HMMWV,” *Proceedings of the Society of Automotive Engineers World Congress*, Detroit, MI, April 3-6, SAE 2006-01-0442, 2006.
23. Shevchenko, N. B., Krauthauser, C., Heider, D., Kim, H. J., **Malikopoulos, A.A.**, Gillespie, Jr., J. W. and Florence, J., “Manufacturing Technology to Sustain the Army’s Wheeled Vehicle Fleet: Reengineering of a Composite HMMWV Hood,” *Proceedings of the 34th ISTC- Baltimore*, MD November 4-7, 2002.
24. Pantelelis, N.G., **Malikopoulos, A.A.**, Kanarachos, A. and Efentakis, N., “Simulation, Implementation and Evaluation of the Production of a Gas- Assisted Long Part,” *Proceedings of the 56th SPE Annual Technical Conference- ANTEC 2001, Society Plastics Engineers*.

Dissertations and Theses:

1. **Malikopoulos, A.A.**, (2008) *Real-Time, Self-Learning Identification and Stochastic Optimal Control of Advanced Powertrain Systems*, Ph.D. Dissertation, Department of Mechanical Engineering, University of Michigan. Committee: Dennis N. Assanis*, Panos Y. Papalambros*, James S. Freudenberg, A. Galip Ulsoy, and Domitilla Del Vecchio.
2. **Malikopoulos, A.A.**, (2000) *Design and Resin Flow Simulation of a Plastic Storing Case for Computer Disks - Design and Manufacturing of Injection Mold for the Production of the Plastic Case*, Diploma Thesis, Department of Mechanical Engineering, National Technical University of Athens (NTUA), Greece.
3. **Malikopoulos, A.A.**, (1994) *Development and Analysis of Optimization Algorithms for Product Design*, BS Thesis, Department of Mechanical Engineering, Technological Educational Institute of Patras, Greece.

PATENTS

1. **Malikopoulos, A.A.**, Driver Feedback for Fuel Efficiency, United States Patent Application Serial No. 61/877,446.
2. **Malikopoulos, A.A.**, *Method for Real-time, Self-Learning Identification of Fuel Injectors During Engine Operation*, United States Patent, US 2011/0137541 A1, June 9, 2011.
3. **Malikopoulos, A.A.**, *Method, Control Apparatus and Powertrain System Controller for Real-Time, Self-Learning Control Based on Individual Operating Style*, United States Patent, US 8,612,107 B2, December 17, 2013.

RESEARCH GRANTS AND AWARDS

Principal Investigator (PI):

1. Laboratory Directed Research and Development Program of Oak Ridge National Laboratory, “Scalable Data and Informatics for Connected Vehicles Leveraged to Enhance Efficiency,” \$860,000, Oct. 2014- Sep. 2016.
2. US Department of Energy, Office of Energy Efficiency and Renewable Energy, Vehicle Technologies Program, “Analysis for Improving Efficiency with Connected Vehicles,” \$100,000, Oct 2013-Sep 2014.
3. US Department of Energy, Office of Energy Efficiency and Renewable Energy, Vehicle Technologies Program, CRADA with PACCAR and Brayton Energy “Gas Turbine Heavy Hybrid Powertrain Variants: Opportunities and Potential for Systems Optimization,” \$300,000, Oct 2013-Sep. 2015.
4. Laboratory Directed Research and Development Program of Oak Ridge National Laboratory, Seed Award, “Intelligent Supervisory Power Management Control in PEVs,” \$185,000, Feb. 2013- Mar 2014.
5. US Department of Energy, Office of Energy Efficiency and Renewable Energy, Vehicle Technologies Program, “Autonomous Intelligent Hybrid Propulsion Systems,” \$400,000, Oct 2011-Sep 2013.
6. Laboratory Directed Research and Development Program of Oak Ridge National Laboratory, Alvin M. Weinberg Award, “Intelligent Advanced Propulsion Systems,” \$179,900, Feb. 2011-Sep. 2012.

Co-principal Investigator (co-PI):

1. Laboratory Directed Research and Development Program of Oak Ridge National Laboratory, “Off-grid Building Management System,” \$2,600,000, Oct. 2014- Sep. 2016.

INVITED SEMINARS

1. *Complex systems in transportation: εϕννία*, Group for Research in Decision Analysis (GERAD) Seminar, McGill University, May 21, 2015, Montreal, Canada.
2. *Optimal Control for Complex Systems in Energy and Transportation*, Computational/Applied Math Seminar in the Department of Mathematics, University of Tennessee, March 11, 2015, Knoxville, TN.
3. *System-Wide Optimal Control for Complex Systems in Transportation*, Seminar in the Department of Civil and Environmental Engineering, University of Virginia, February 20, 2015, Charlottesville, VA.
4. *A Multiobjective Optimization Framework for Stochastic Optimal Control in Complex Transportation Systems*, Seminar in the Center of Information & Systems Engineering, Boston University, December 19, 2013, Boston, MA.
5. *A Duality Framework for Online Optimal Control in Transportation Systems*, Seminar in the Department of Industrial and Systems Engineering, University of Tennessee, November 8, 2013, Knoxville, TN.

6. *A Multiobjective Optimization Framework for Online Optimal Control of Hybrid Electric Vehicles*, Seminar in the department of Mechanical Engineering at the University of Minnesota, October 30, 2013, Minneapolis, MN.
7. *A Multiobjective Optimization Framework for Stochastic Optimal Control in Complex Systems*, Seminar in the School of Aerospace Engineering, Georgia Institute of Technology, May 23, 2013, Atlanta, GA.
8. *Reverse-Engineering the Brain for Reproducing Intelligence in Applications Related to Energy and Transportation*, Seminar at the University of Tennessee Bredesen Center, February 14, 2013, Oak Ridge, TN.
9. *Average Cost Criterion in Controlled Markov Chains: Enabling Theoretical Framework for Optimal Solution Characterization*, Seminar in the Aerospace Robotics and Embedded Systems Laboratory, MIT, June 18, 2012, Cambridge, MA.
10. *Dual Constrained Optimization of the Average Cost in Markov Chain*, Seminar in the Department of Aerospace, University of Michigan, April 30, 2012, Ann Arbor, MI.
11. *Equilibrium Control Policies for Markov Chains*, Colloquium in the Department of Mathematics, University of Tennessee, February 24, 2012, Knoxville, TN.
12. *Stochastic Control and Optimization for Eco-Driving Feedback Technologies*, Seminar in the Department of Electrical Engineering, University of Texas, October 24, 2011, Austin, TX.
13. *Self-Learning Identification and Stochastic Control for Autonomous Intelligent Propulsion Systems*, Colloquium in the Department of Mathematics, University of Tennessee, April 27, 2011, Knoxville, TN.
14. *Self-Learning Identification and Stochastic Control for Autonomous Intelligent Propulsion Systems*, Seminar in the Department of Mechanical Engineering, University of Tennessee, March 24, 2011, Knoxville, TN.
15. *Self-Learning Identification and Stochastic Control for Autonomous Intelligent Propulsion Systems*, 2010 National Academy of Engineering (NAE) German-American Frontiers of Engineering Symposium, Oak Ridge National Laboratory, April 23-25, 2010, Oak Ridge, TN.

INVITED SPEAKER AND PANELIST

1. Decentralized Optimal Control of Connected Vehicles at Intersections, Invited Speaker and Panelist in the Session “Traffic Signal Control with Connected and Automated Vehicles,” “Automated Vehicle Symposium 2015, July 21-23, 2015, Ann Arbor, Michigan.
2. System-Wide Optimal Control for Connected Vehicles, Invited Speaker and Panelist in the Session “Connected Electrified Vehicles and Cybersecurity,” iTEC2015, June 15, 2015, Dearborn, Michigan.
3. Optimal Control for Hybrid Electric Vehicles, Invited Speaker and Panelist in the Session “Advancements in Energy Management and Controls for Electric Vehicles,” iTEC2015, June 15, 2015, Dearborn, Michigan.
4. System-Wide Optimal Control for Connected Vehicles, Invited Speaker at Big Data for Connected Cars and Internet of Things Conference, June 2, 2015, Novi, Michigan.
5. A Consumer-Oriented Control Framework for Performance Analysis in Hybrid Electric Vehicles, Invited talk at the Advanced Hybrid division at Cummins Corporate Research & Technology, Columbus, Indiana, October 21, 2014.
6. A Duality Framework for Stochastic Optimal Control of Complex Systems, Invited talk at the 3rd Midwest Workshop on Control and Game Theory, Columbus, Ohio, April 20, 2014.
7. A Multiobjective Optimization Framework for Stochastic Optimal Control of Advanced Propulsion Systems, Invited talk at the 2013 IEEE Workshop on Open Problems and Challenges in Automotive Control, Washington, D.C., June 20, 2013.
8. *Stochastic Optimal Control for Advanced Propulsion Systems*, 2012 DOE Crosscut Workshop on Lean Emissions Reduction Simulation Workshop, University of Michigan, Dearborn, Michigan, April 30- May 2, 2012.
9. *Self-Learning Identification and Stochastic Control for Autonomous Intelligent Propulsion Systems*, 2011 DOE Crosscut Workshop on Lean Emissions Reduction Simulation Workshop, University of Michigan, Dearborn, Michigan, April 19-21, 2011.

IN THE NEWS

- Nelson, P (2015), “How connected cars will optimize traffic flow,” Network World, April 21, 2015.
<http://www.networkworld.com/article/2911456/big-data-business-intelligence/how-connected-cars-will-optimize-traffic-flow.html>
- “US scientists to develop computational framework to optimize road traffic,” Road Traffic Technology, April 7, 2015.
<http://www.roadtraffic-technology.com/news/newsus-scientists-to-develop-computational-framework-to-optimise-road-traffic-4547325>
- “Connected vehicle technology aims to improve travel times,” Design Products & Applications, April 4, 2015.
<http://www.dpaonthenet.net/article/91721/Connected-vehicle-technology-aims-to-improve-travel-times.aspx>
- McCorkle, M. (2015), “Computational framework for optimizing traffic flow could be the beginning of a road revolution, PhyOrg, April 3, 2015.
<http://phys.org/news/2015-04-framework-optimizing-traffic-road-revolution.html>
- “Developing a Framework for Connected Vehicle Technologies,” Informed Infrastructure, April 3, 2015.
<https://informedinfrastructure.com/14019/developing-a-framework-for-connected-vehicle-technologies/>
- Jones, K. E., (2015), “Road revolution by connecting vehicles: Computational framework for optimizing traffic flow,” Science Daily, April 2, 2015
<http://www.sciencedaily.com/releases/2015/04/150402114701.htm>
- McCorkle, M. (2015), “Connecting Vehicles,” R&D Magazine, April 2, 2015.
<http://www.rdmag.com/news/2015/04/connecting-vehicles>
- The project on Connected and Automated Vehicles (CAVs) was featured in the ORNL website.
<http://www.ornl.gov/ornl/news/features/2015/connecting-vehicles>
- Millikin, M. (2014) “ORNL, UT Austin team proposes optimization framework for hybrids; balancing fuel consumption, motor efficiency, battery capacity and life,” Green Car Congress, December 22, 2014.
<http://www.greencarcongress.com/2014/12/20141222-andreas.html>
- Pyper, J. (2014) “Self-driving cars could cut greenhouse gas pollution,” Scientific American, September 15, 2014.
<http://www.scientificamerican.com/article/self-driving-cars-could-cut-greenhouse-gas-pollution/>
- Walli, R. (2014) “Vehicles – Connected to savings,” EurekAlert, September 3, 2014.
http://www.eurekalert.org/pub_releases/2014-09/drn1-stf_1090314.php
- Millikin, M. (2014) “Survey of power management control technologies for HEVs and PHEVs suggests future need to consider vehicle as part of larger system,” Green Car Congress, April 11, 2014.
<http://www.greencarcongress.com/2014/04/20140411-malikopoulos.html>
- Featured in the website of the Department of Mechanical Engineering at the University of Michigan.
<https://me-web2.engin.umich.edu/pub/news/newsitem?newsItemId=664>
- Featured in the *Sustainable Transportation Program Update*, Oak Ridge National Laboratory, Vol. 4, No. 2, August 2013.
- Featured in the ORNL website
<http://www.ornl.gov/ornl/careers/working-at-ornl/andreas-malikopoulos>
- Millikin, M. (2013) “ORNL researcher proposes more efficient control strategy for series hybrids,” Green Car Congress, July 9, 2013.
<http://www.greencarcongress.com/2013/07/malikopoulos-20130709.html>
- Millikin, M. (2013) “ORNL researcher explores impact of motor/generator and battery pack sizing on medium-duty PHEV; optimization framework,” Green Car Congress, January 4, 2013.
<http://www.greencarcongress.com/2013/01/aam-20130104.html>
- Featured in *Clean Energy Research Highlights*, Oak Ridge National Laboratory, January 1, 2013

- <http://www.ornl.gov/science-discovery/clean-energy/research-highlights/ids-models-transportation>
- Millikin, M. (2012) "ORNL researchers propose optimization framework for use in real-time feedback systems to improve driving styles with reduced fuel consumption," Green Car Congress, October 3, 2012.
<http://www.greencarcongress.com/2012/10/malikopoulos-20121003.html>
- Millikin, M. (2012) "Oak Ridge researcher developing autonomous intelligent engines capable of real-time calibration based on driver behavior," Green Car Congress, May 24, 2012.
<http://www.greencarcongress.com/2012/05/malikopoulos-20120524.html>

FELLOWSHIPS, HONORS, AND AWARDS

- Best presentation in session, 2013 American Control Conference.
- Best poster award, 2012 Oak Ridge National Laboratory Directed R&D program's annual poster session.
- 2012 Kavli Frontiers of Science Scholar, National Academy of Sciences.
- Recipient of the 2010 Alvin M. Weinberg Fellowship at Oak Ridge National Laboratory.
- 2010 German-American Frontiers of Engineering Symposium (GAFOE), National Academy of Engineering.
- Author of one of the top 10 most downloaded articles in *ASME J. Eng. Gas Turbines Power* during January and February of 2010.
- 2007 *Dare to Dream Opportunity Grant* from the Samuel Zell & Robert H. Lurie Institute of University of Michigan Ross School of Business.
- 2007 Michigan Teaching Fellow, University of Michigan Horace H. Rackham School of Graduate Studies and the Center for Research on Learning and Teaching.
- 2006 Engineering and Science Academic Scholar, College of Engineering, University of Michigan.
- 2nd Place Award in the Oral Presentation and 1st Place Award in the Poster Presentation Competition in the Design and Manufacturing & Industrial and Systems Engineering session, 2006 Engineering Graduate Student Symposium, University of Michigan.
- 1st Place Award in the Oral Presentation and 2nd Place Award in the Poster Presentation Competition in Dynamics, Systems and Controls session, 2005 Engineering Graduate Student Symposium, University of Michigan.
- Graduate Student Research Assistantships (2004-08), University of Michigan.
- Graduate Student Fellowship (2003-04), Gerondelis Foundation.
- Graduate Student Fellowship (2003-04), University of Michigan.
- Admitted 1st in the Department of Mechanical Engineering at the National Technical University of Athens (NTUA), Greece, after the Pan-Hellenic examinations in 1995.
- Graduated 1st cum laude from the Department of Mechanical Engineering of the Technological Educational Institute of Patras, Greece, in 1994.

PROFESSIONAL ASSOCIATIONS

- IEEE, Institute of Electrical & Electronics Engineers (since 2006)
- SIAM, Society of Industrial and Applied Mathematics (since 2006)
- ASME, American Society of Mechanical Engineers (since 2003)
- Member of MENSA (since 1998)

ACADEMIC AND PROFESSIONAL SERVICE

- President, Oak Ridge Postdoc Association (ORPA) October 2012-September 2013
 - Organized and led ORPA to foster a sense of community for approximately 270 Postdoctoral Research Associates at Oak Ridge National Laboratory (ORNL), provide resources, and contribute a framework for their representation in the ORNL community.

- As the president of ORPA he took the following major initiatives:
 - o Created 4 committees: (1) the social and communication committee; (2) the professional development committee; (3) the research committee; and (4) the international committee, assigned a chair to each committee, and chaired biweekly meetings.
 - o Established the *Annual ORNL Postdoc Research Symposium*. Recruited an organizing committee, and led the team to a successful organization of the first of this kind event at ORNL.
- Secretary, Model Identification and Intelligent Systems Technical Committee, ASME Dynamic Systems and Control Division October 2012-present
- Reviewer
 - IEEE Transactions on Automatic Control
 - IEEE Transactions on Control Systems Technology
 - IEEE Transactions on Intelligent Transportation Systems
 - Transportation Research Part B: Methodological
 - Transportation Research Part C: Emerging Technologies
 - IEEE Transactions on Vehicular Technology
 - IEEE/ASME Transactions on Mechatronics
 - Control Engineering Practice
 - IEEE Conference on Decision and Control Conference
 - American Control Conference (ACC)
 - European Control Conference (ECC)
 - IEEE Conference on Intelligent Transportation Systems
 - ASME Dynamic Systems and Control Conference
 - ASME Internal Combustion Engine Division Technical Conferences
- Session Chair:
 - Intelligent Systems, *ASME International Mechanical Engineering Congress and Exposition Technical Conference 2007, Seattle, Washington, November 11-15, 2007.*
 - Intelligent Systems, *2010 ASME Dynamic Systems and Control Conference, Ann Arbor, Michigan, October 12-14, 2009.*
 - Controls and Hybrids, *2011 ASME Internal Combustion Engine Division Fall Technical Conference, Morgantown, West Virginia, October 2-5, 2011.*
 - Stochastic Optimal Control, *50th IEEE Conference on Decision and Control and European Control Conference in 2011, Orlando, Florida, December 10-13, 2011.*
 - Controls and Hybrids, *2012 ASME Internal Combustion Engine Division Spring Technical Conference, Torino, Italy, May 6-9, 2012.*
 - Route Planning and Guidance, *2012 15th IEEE Conference on Intelligent Transportation Systems, Anchorage, Alaska, September 16-19, 2012.*
 - Optimal Control II, *2013 American Control Conference, Washington, D.C., June 17-19, 2013.*
 - Controls and Hybrids, *2014 ASME Internal Combustion Engine Division Fall Technical Conference, Columbus, Indiana, October 19-22, 2014.*
- Active Member:
 - IEEE Technical Committee on Automotive Control
 - IEEE Technical Committee on Medical and Health Care Systems
 - ASME Technical Committee on Model Identification and Intelligent Systems (MIIS)
 - SAE Dynamical Modeling and Simulation Committee
 - International Federation of Automatic Control (IFAC) Technical Committee on Stochastic Systems
 - International Federation of Automatic Control (IFAC) Technical Committee on Automotive Control

- International Federation of Automatic Control (IFAC) Technical Committee on Intelligent Autonomous Vehicles

LANGUAGES

Fluent English, fluent Greek (Native), basic German, beginning level Chinese (Mandarin).