Curriculum Vitae

Ardalan Vahidi, Ph.D.
Professor, IEEE Fellow, ASME Fellow
Clemson University
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EDUCATION

Ph.D., Mechanical Engineering (Systems & Control), University of Michigan, Ann Arbor, Michigan	09/2001-08/2005
M.Sc., Transportation Safety, George Washington University, Washington DC	01/1999-08/2001
M.Sc., Structural Engineering, Sharif University of Technology, Tehran	09/1996-07/1998
B.Sc., Civil Engineering, Sharif University of Technology, Tehran	09/1992-07/1996

ACADEMIC AND RESEARCH EXPERIENCE

Clemson University, Professor of Mechanical Engineering	08/2017- present
University of California, San Diego, Visiting Scholar, MAE Department	07/2022-08/2022
IFP Energies Nouvelles, Paris, France, Scientific Visitor	05/2017-08/2017
Clemson University, Associate Professor of Mechanical Engineering	08/2011-07/2017
University of California, Berkeley, Visiting Scholar, Department of Mechanical Engineering	06/2012-08/2013
BMW Group Technology Office, California, USA, Research Fellow	06/2012-08/2013
Clemson University, Assistant Professor of Mechanical Engineering	08/2005-07/2011

EXPERIENCE HIGHLIGHTS

- Pioneered research in controls, v2x communication, and real-time computing enhancing mobility of automated vehicles
- Analytical and experimental research on electric vehicles, fuel cells, supercapacitors, and batteries
- Principal Investigator on 20+ government and industry funded projects totaling $6M
- Demonstrated leadership in execution of large federally funded projects to completion and technology transfer
- Published 1 book and 100+ papers with 10,000 citations
- Advised 23 graduate students to completion. Advised 20 undergraduate students.

RESEARCH EXPERTISE AND INTERESTS

Areas	Applications
Autonomous Systems	Automated and Connected Vehicles
Human-Robot Interaction	Off-Road Robotic Vehicles
Optimal Control and Estimation	Electrified and Shared Transportation
Reinforcement Learning	Energy Devices: Fuel Cells, Supercapacitors, Batteries
Game Theory	Human Performance at Endurance Limits

HONORS AND AWARDS

Fellow, Institute of Electrical and Electronics Engineers (IEEE)	2024
Best Paper Award, Transportation Research Board (TRB)	2024
Fellow, American Society of Mechanical Engineers (ASME)	2020
Collaboration Award, Clemson College of Engineering, Computing, and Applied Science	2020
Best paper award in Transportation and Automotive Systems, 2020 American Control Conference	2020
Best paper award in Transportation and Automotive Systems, 2018 ASME DSC Conference	2019
Advisor and co-author, IFAC Young Author Award, IFAC AAC 2019	2019
Eastman Award of Research and Teaching Excellence, Clemson University	2012 & 2019
First Prize, Graduate Student Symposiums, Dept. Mechanical Eng., University of Michigan	2003 & 2004
Third Prize, The First Iranian Universities Civil Eng. Olympiad, Awarded by Ministry of Higher Education	1996
Ranked 11th, Nationwide University Entrance Examination for Iranian Universities among 300,000 Participants	1992

LEADERSHIP AND SERVICE

National and International
- Chair, Invited Sessions, 2020 American Control Conference, 2018-2020
- Associate Editor, IEEE Transactions on Control Systems Technology, 2019-2023
- Associate Editor, ASME Journal of Dynamic Systems, Measurement, and Control, 2015-2018
- Chair, Student Programs, 2016 American Control Conference, 2014-2016
- Member, ASME DSCD Executive Committee (Treasurer) (2012-2015)
- Program Committee and Associate Editor: 2011-2015 American Control Conference
- Associate Editor: 2009-2011 ASME Dynamic Systems and Control Conference
- Fellow, American Society of Mechanical Engineers, ASME, (2020-)
- Fellow, Institute of Electrical and Electronics Engineers, IEEE, (2024-)
- Member, IEEE Technical Committee on Smart Cities (TCSC) (2015-)
- Member, IEEE Technical Committee on Automotive Controls (TCAC), (2005-)
- Member, ASME Technical Committee on Automotive and Transportation Systems (ATS), (2005-)

Department and University Level
- Chair, Faculty Search Committee, Mechanical Engineering, 2018-2019
- Chair, Faculty Search Committee, Mechanical Engineering, 2017-2018
- Chair, Dynamic Systems and Control Group, Mechanical Engineering, 2016-2021
- Chair, Assessment Committee, Mechanical Engineering, 2016-2018
- Chair, Graduate and Research Committee, Mechanical Engineering, 2013-2014
- Chair, Honors and Awards Committee, Mechanical Engineering, 2011-2012
- Member, Tenure and Promotion Committee, 2018-ongoing
- Member, Ad-Hoc By-Laws Committee, 2020-2022
- Member, Department Chair Advisory Committee, Mechanical Engineering, 2017-2018
- Member, Honors and Awards Committee, College of Engineering and Applied Science, 2011-2012
- Member, Department Chair Search Committee, Mechanical Engineering (2009-2010)
- Member, Seminar Committee, Mechanical Engineering, 2005-2009
- Faculty Advisor, Formula SAE and Mini Baja Teams, 2014-2016

PUBLICATIONS

Book

B1. A. Sciarretta and A. Vahidi, *Energy Efficient Driving of Road Vehicles: Towards Cooperative, Connected, and Automated Mobility*, Springer, 2019.

Journals (in review)

J48. V. Bhattacharyya and A. Vahidi, "Interactive Motion Planning for Autonomous Vehicles via Adaptive Interactive MPC," in review, *IEEE Transactions on Control Systems Technology,* 2024.

Journals (published)

J47. A. Dollar, A. Vahidi, B. Pattel, and H. Borhan, "A Linear Programming Formulation for Eco-Driving Over Road Slopes," *Automatica*, **161**, 2024.

J46. M. Shen, A. Dollar, T. Molnar, C. He, A. Vahidi, and G. Orosz, "Energy-Efficient Reactive and Predictive Connected Cruise Control," *IEEE Transactions on Intelligent Vehicles*, 2023.

J45. F. Ashtiani and A. Vahidi, "Dynamic Optimization of Formation and Pace in A Cycling Team Time Trial Considering Effects of Drafting and Cyclists' Fatigue and Recovery," *Control Engineering Practice*, **137**, 2023.

J44. T. Ard, B. Pattel, K. Fuhs, A. Vahidi, and H. Borhan "Simulated and Experimental Verification of Fuel Efficient Truck Platooning with Predictive Control Under Grade and Traffic Disturbances", *ASME Journal of Autonomous Vehicles and Systems*, **2**, 2023.

J43. S. Karimi, A. Karimi, and A. Vahidi, "Level-K reasoning, deep reinforcement learning, and Monte Carlo decision process for fast and safe automated lane change and speed management," *IEEE Transactions on Intelligent Vehicles*, **8**, 3556 – 3571, 2023.

J42. T. Ard, L. Guo, J. Han, Y. Jia, A. Vahidi, and D. Karbowski, "Energy-Efficient Driving in Connected Corridors via Minimum Principle Control: Vehicle-in-the-Loop Experimental Verification in Mixed Fleets," *IEEE Transactions on Intelligent Vehicles*, **8**, 1279-1291, 2023.

J41. F. Ashtiani, V. Sreedhara, A. Vahidi, R. Hutchison, and G. Mocko, "Optimal Pacing of a Cyclist in a Time Trial Based on Individualized Models of Fatigue and Recovery," *IEEE Transactions on Control Systems Technology*, 31, 317-332, 2023. [arXiv link]

J40. T. Ard, L. Guo, A. Dollar, A. Fayazi, N. Goulet, Y. Jia, B. Ayalew, and A. Vahidi . "Energy and Flow Effects of Optimal Automated Driving in Mixed Traffic: Vehicle-in-the-Loop Experimental Results," *Transportation Research Part C*, **130**, 2021. [arXiv link]

J39. S. Karimi and A. Vahidi, "Monte Carlo Tree Search and Cognitive Hierarchy Theory for Interactive-Behavior Prediction in Automated Lane Change," *ASME Journal of Autonomous Vehicles and Systems*, **1**, 011008, 2021.

J38. A. Dollar and A. Vahidi, "Multilane Automated Driving with Optimal Control and Mixed Integer Programming," *IEEE Transactions on Control Systems Technology*, **29**, 2561 - 2574, 2021.

J37. T. Ard, A. Dollar, A. Vahidi, Y. Zhang, and D. Karbowski, "Evaluating the Impact of Autonomous Vehicles with Optimal Eco-Driving in High Fidelity Traffic Microsimulations," *Transportation Research Part C*, **120**, 2020.

J36. V. Sreedhara, F. Ashtiani, G. Mocko, A. Vahidi, and R. Hutchison, "Modeling the Recovery of W' in the Moderate to Heavy Exercise Intensity Domain," *Medicine & Science in Sports & Exercise*, **52**, 2646-2654, 2020.

J35. G. G. M. Nawaz Ali , Beshah Ayalew, Ardalan Vahidi, and Md. Noor-A-Rahim, "Feedbackless Relaying for Enhancing Reliability of Connected Vehicles," *IEEE Transactions on Vehicular Technology*, **69**, 4621 – 4634, 2020.

J34. A. Fayazi, A. Vahidi, and A. Luckow, "A Vehicle-in-the-loop (VIL) Verification of an all-Autonomous Intersection Traffic Management," *Transportation Research, Part C,* **107**, 193-210, 2019.

J33. J. Han, A. Vahidi, and A. Sciarretta, "Fundamentals of Energy Efficient Driving for Combustion Engine and Electric Vehicles: An Optimal Control Perspective," *Automatica*, **103**, 558-572, 2019.

J32. N. Wan, C. Zhang, and A. Vahidi, "Probabilistic Anticipation and Control in Autonomous Car Following," *IEEE Transactions on Control Systems Technology*, **27**, 30-38, 2019.

J31. A. Vahidi and A. Sciarretta, "Energy Saving Potentials of Connected and Automated Vehicles," *Transportation Research Part C*, **95**, 822-843, 2018.

J30. R. A. Dollar and A. Vahidi, "Efficient and Collision-Free Anticipative Cruise Control in Randomly Mixed Strings," *IEEE Transactions on Intelligent Vehicles*, **3**, 439-452, 2018.

J29. A. Fayazi and A. Vahidi, "Mixed Integer Linear Programming for Optimal Scheduling of Autonomous Vehicle Passage Through Intelligent Intersections," *IEEE Transactions on Intelligent Vehicles*, **3**, 287-299, 2018.

J28. J. Roy, N. Wan, A. Goswami, A. Vahidi, P. Jayakumar, and C. Zhang, "A Hierarchical Route Guidance Framework for Off-Road Connected Vehicles," *ASME Journal of Dynamic Systems, Measurement, and Control*, **140**, 2018.

J27. Y. Parvini and A. Vahidi, A. Fayazi, "Heuristic versus Optimal Charging of Supercapacitors, Lithium-Ion and Lead-Acid Batteries: An Efficiency Point of View," *IEEE Trans. on Control Systems Technology*, **26**, 167-180, 2018.

J26. R. Hutchison, R., G. Klapthor, K. Edwards, A. Vahidi, G. Mocko, G., K. Bruneau, "Validity and Reproducibility of the Garmin Vector Power Meter when Compared to the SRM Device," *Journal of Sports Science*, **5**, 235-241, 2017 .

J25. B. HomChaudhuri, A. Vahidi, and P. Pisu, "Fast Model Predictive Control Based Fuel Efficient Control Strategy for a Group of Connected Vehicles in Urban Road Conditions," *IEEE Transactions on Control Systems Technology*, 760-767, 25, 2017.

J24. N. Wan and A. Vahidi, and A. Luckow, "Optimal Speed Advisory For Connected Vehicles in Arterial Roads and The Impact on Mixed Traffic," *Transportation Research: Part C*, **69**, 548-563, 2016.

J23. N. Wan, A. Vahidi, and A. Luckow, "Reconstructing Maximum Likelihood Trajectory of Probe Vehicles Between Sparse Updates," *Transportation Research: Part C*, **65**, 16-30, 2016.

J22. A. Fayazi, A. Vahidi, "Crowdsourcing Phase and Timing of Pre-Timed Traffic Signals in Presence of Queues: Algorithms and Backend System Architecture," *IEEE Trans. on Intelligent Transportation Systems*, **17**, 870-881, 2016.

J21. S. Schepmann and A. Vahidi, "Ultracapacitor Power Assist with Preview-based Energy Management For Reducing Fuel Consumption of Heavy Vehicles," *International Journal of Powertrain*, **5**, 375-394, 2016.

J20. Y. Parvini, J. Siegel, A. Stefanopoulou, and A. Vahidi, "Identification and Validation of an Electro-Thermal Model of Cylindrical Double Layer Supercapacitors for Low and High Power and Temperature Operations," *IEEE Transactions on Industrial Electronics*, **63**, 1574-1585, 2016.

J19. A. Fayazi, A. Vahidi, G. Mahler, and A. Winckler, "Traffic Signal Phase and Timing Estimation from Low-Frequency Vehicular Probe Data," *IEEE Transactions on Intelligent Transportation Systems*, **16**, 19-28, 2015.

J18. G. Mahler and A. Vahidi, "An Optimal Velocity-Planning Scheme for Vehicle Energy Efficiency Through Probabilistic Prediction of Traffic-Signal Timing," *IEEE Transactions on Intelligent Transportation Systems*, **15**, 2516-2523, 2014.

J17. H. Borhan and A. Vahidi, "Model predictive control of a hybrid electric powertrain with combined battery and ultracapacitor energy storage system," *International Journal of Powertrain*, **1**, 351-376, 2012.

J16. H. Borhan, A. Vahidi, Tony Phillips, Ming Kuang, Ilya Kolmanovsky, and Stefano Di Cairano, "MPC-based Energy Management of a Power-Split Hybrid Electric Vehicle," *IEEE Transactions on Control Systems Technology*, **20**, 593-603, 2012.

J15. C. Zhang and A. Vahidi, "Route Preview in Energy Management of Plug-in Hybrid Vehicles," *IEEE Transactions on Control Systems Technology*, **20**, 546-553, 2012.

J14. B. Asadi and A. Vahidi, "Predictive Cruise Control for Improving Fuel Economy and Reducing Trip Time," *IEEE Transactions on Control Systems Technology*, **19**, 707-714, 2011.

J13. D. Rotenberg, A. Vahidi, and I. Kolmanovsky, "Ultracapacitor Assisted Powertrains: Modeling, Control, Sizing, and The Impact on Fuel Economy," *IEEE Transactions on Control Systems Technology*, **19**, 576-589, 2011.

J12. C. Zhang, A. Vahidi, P. Pisu, X. Li, and K. Tennant, "Role of Terrain Preview in Energy Management of Hybrid Electric Vehicles," *IEEE Trans. on Vehicular Technology*, **59**, 1139-1147, 2010.

J11. W. Greenwell and A. Vahidi, "Predictive Control of Voltage and Current in a Fuel Cell-Ultracapacitor Hybrid," *IEEE Transactions on Industrial Electronics*, **57**, 1954-1963, 2010.

J10. M. McIntyre, T. Ghotikar, A. Vahidi, X. Song, and Darren Dawson, "A Two-Stage Lyapunov-Based Estimator for Estimation of Vehicle Mass and Road Grade," *IEEE Transactions on Vehicular Technology*, **58**, 3177-3185, 2009.

J9. W. Schmittinger and A. Vahidi, "A Review of the Main Parameters Influencing Long-Term Performance and Durability of PEM Fuel Cells," *Journal of Power Sources*, **180**, 1-14, 2008.

J8. A. Vahidi, I. Kolmanovsky, and A. Stefanopoulou, "Constraint Handling in a Fuel Cell System: A Fast Reference Governor Approach," *IEEE Transactions on Control Systems Technology*, **15**, 86-98, 2007.

J7. A. Vahidi, A. Stefanopoulou, and H. Peng, "Current Management in a Hybrid Fuel Cell Power System: A Model Predictive Control approach," *IEEE Trans. on Control Systems Technology*, **14**, 1047-1057, 2006.

J6. A. Vahidi, A. Stefanopoulou, and H. Peng, "Adaptive Model Predictive Control for Coordination of Compression and Friction Brakes in Heavy Duty Vehicles," *Journal of Adaptive Control and Signal Processing*, **20**, 581-598, 2006.

J5. A. Vahidi, A. Stefanopoulou, and H. Peng, "Recursive Least Squares with Forgetting for Online Estimation of Vehicle Mass and Road Grade: Theory and Experiments," *Vehicle System Dynamics*, **43**, 31-57, 2005.

J4. A. Vahidi and A. Eskandarian, "Research Advances in Intelligent Collision Avoidance and Adaptive Cruise Control," *IEEE Transactions on Intelligent Transportation Systems*, **4**, 3, pp. 143-153, 2003.

J3. A. Vahidi and A. Eskandarian, "Influence of Preview Uncertainties in the Preview Control of Vehicle Suspensions," *Journal of Multi-Body Dynamics*, **216**, pp. 295-301, 2002.

J2. A. Vahidi and A. Eskandarian, "Predictive Time-Delay Control of Vehicle Suspensions," *Journal of Vibration and Control*, **7**, pp. 1195-1211, 2001.

J1. A. Joghataie and A. Vahidi, "Designing A General Neuro-Controller for Water Towers," *ASCE Journal of Engineering Mechanics*, **126**, pp. 582-587, 2000.

Refereed Conference Publications

C57. J. Han, T. Ard, P. Gupta, R. Wang, A. Vahidi, Y. Jia, D. Karbowski, "Human Driver Interaction with An Eco-Speed Advisory System in Connected Vehicles: Simulation and Experimental Results," in *Proceeding of Transportation Research Board*, 2024. **[Winner, Best Paper Award, Road User Measurement and Evaluation (ACH50) Committee]**

C56. P. Gupta, R. Wang, T. Ard, J. Han, D. Karbowski, A. Vahidi, and Y. Jia "An X-in-the-Loop (XIL) Testing Framework for Validation of Connected and Autonomous Vehicles" In *Proceedings of IEEE International Automated Vehicle Validation Conference*, Austin, TX, 2023. **[Winner, 2nd Best Paper Award]**

C55. V. Bhattacharyya and A. Vahidi, "Automated Vehicle Highway Merging: Motion Planning via Adaptive Interactive Mixed-Integer MPC", in *Proceedings of American Control Conference*, San Diego, CA, 2023

C54. T. Ard, B. Pattel, A. Vahidi, and A. Borhan, "Considerate and Cooperative Model Predictive Control for Energy-Efficient Truck Platooning of Heterogeneous Fleets," in *Proceedings of American Control Conference*, 2022.

C53. R. A. Dollar, T. G. Molnar, A. Vahidi, G. Orosz, "MPC-Based Connected Cruise Control with Multiple Human Predecessors," in *Proceedings of American Control Conference*, 2021.

C52. R. A. Dollar, A. Sciarretta, and A. Vahidi "Information and Collaboration Levels in Vehicular Strings: A Comparative Study," in *Proceedings of IFAC World Congress*, Berlin, Germany, 2020.

C51. S. Karimi and A. Vahidi, "Receding Horizon Motion Planning for Automated Lane Change and Merge Using Monte Carlo Tree Search and Level-K Game Theory," in *Proceedings of American Control Conference*, Denver, CO, 2020.

C50. T. Ard, F. Ashtiani, A. Vahidi, H. Borhan, "Optimizing Gap Tracking Subject to Dynamic Losses via Connected and Anticipative MPC in Truck Platooning," in *Proceedings of American Control Conference*, Denver, CO, 2020. **[Winner of ASME Automotive and Transportation Systems Best Paper Award]**

C49. R. A. Dollar, A. Sciarretta, and A. Vahidi, "Multi-Agent Control of Lane-Switching Automated Vehicles for Energy Efficiency," in *Proceedings of American Control Conference*, Denver, CO, 2020.

C48. G. G. M. Nawaz Ali , B. Ayalew, A. Vahidi, and Md. Noor-A-Rahim, "Analysis of Reliabilities Under Different Path Loss Models in Urban/Sub-urban Vehicular Networks," *Proceedings of IEEE 90th Vehicular Technology Conference,* Honolulu, HI, 2019.

C47. R.A. Dollar and A. Vahidi, "Automated Vehicles in Hazardous Merging Traffic: A Chance Constrained Approach," in *Proceedings of IFAC Conference on Advances in Automotive Control,* Nice, France, 2019. **[Winner of International Federation of Automatic Control Young Author Award]**

C46. F. Ashtiani, V. Sreedhara, A. Vahidi, R. Hutchison, and G. Mocko, "Experimental Modeling of Cyclists Fatigue and Recovery Dynamics Enabling Optimal Pacing in A Time Trial," in *Proceedings of American Control Conference*, 2019.

C45. D. Rathod, B. Xu, A. Yebi, A. Vahidi, Z. Filipi, and M. Hoffman. A Look-ahead Model Predictive Control Strategy for an Organic Rankine Cycle-Waste Heat Recovery System in a Heavy Duty Diesel Engine Application. No. 2019-01-1130. *SAE Technical Paper*, 2019.

C44. D. Gundana, R. A. Dollar, and A. Vahidi, "To Merge Early or Late: Analysis of Traffic Flow and Energy Impact in a Reduced Lane Scenario," in *Proceedings of IEEE ITSC*, Maui, HI, 2018.

C43. S. Karimi, A. Vahidi, and P. Jayakumar, "A Comprehensive Framework for Simulating Dynamics of An Off-Road Vehicle in Unstructured Environments," *Proceedings of ASME DSCC*, Atlanta, GA, 2018.

C42. R. A. Dollar and A. Vahidi, "Predictive Coordinated Vehicle Acceleration and Lane Selection Using Mixed Integer Programming," *Proceedings of ASME DSCC*, Atlanta, GA, 2018. [**Winner of ASME Automotive and Transportation Systems Best Paper Award**]

C41. J. Han, J. Rios-Torres, A. Vahidi, A. Sciarretta, "Impact of Model Simplification on Optimal Control of Combustion Engine and Electric Vehicles Considering Control Input Constraints," in *Proceedings of IEEE VPCC*, Chicago, IL, 2018.

C40. A. Goswami, H. Saeidi, A. Vahidi, and P. Jayakumar, "Implementation of Hierarchical Framework with Accurate Localization and Low Level Control in a Low-Cost Scaled Autonomous Car," in *Proceedings of American Control Conference*, Milwaukee, WI, 2018.

C39. R. Koli, H. Arunachalam, Qi. Zhu, S. Onori, A. Vahidi, and R. Prucka, "Nonlinear Model Predictive Control of Dual Loop - Exhaust Gas Recirculation in a Turbocharged Spark Ignited Engine," in *Proceedings of American Control Conference*, Milwaukee, WI, 2018.

C38. F. Ashtiani, A. Fayazi, and A. Vahidi, "Multi-Intersection Traffic Management for Autonomous Vehicles via Distributed Mixed Integer Linear Programming," in *Proceedings of American Control Conference*, Milwaukee, WI, 2018.

C37. A. Dollar and A. Vahidi, "Quantifying the Impact of Limited Information and Control Robustness on Connected Automated Platoons," *Proceedings of IEEE ITSC*, Yokohama, Japan, 2017.

C36. G. Mahler, A. Winckler, A. Fayazi, A. Vahidi, and M. Filusch, "Cellular Communication of Traffic Signal State to Connected Vehicles for Arterial Eco-Driving," *Proceedings of IEEE ITSC*, Yokohama, Japan, 2017.

C35. A. Fayazi and A. Vahidi, "A Smart City Traffic Management Scheme and Vehicle-in-the-loop (VIL) Verification Platform for Autonomous Driving," *Proceedings of IEEE CCTA*, Kohala Coast, HI, 2017 .

C34. A. Fayazi, A. Vahidi, and A. Luckow, "Optimal Scheduling of Autonomous Vehicle Arrivals at Intelligent Intersections via MILP" *Proceedings of American Control Conference*, Seattle, WA, 2017.

C33. Y. Parvini and A. Vahidi, "Maximizing Charging Efficiency of Lithium-Ion and Lead-Acid Batteries Using Optimal Control Theory, " in *Proceedings of American Control Conference*, Chicago, IL, 2015.

C32. B. HomChaudhuri, A. Vahidi, and P. Pisu "A Fuel Economic Model Predictive Control Strategy for a Group of Connected Vehicles in Urban Roads," in *Proceedings of American Control Conference*, Chicago, IL, 2015.

C31. N. Wan and A. Vahidi, "Maximum Likelihood Estimation of Vehicle Trajectories at Intersections Using Sparse Transit Bus Data," in *Proceedings of Transportation Research Board*, Washington DC, 2015.

C30. N. Wan and A. Vahidi, "Probabilistic Estimation of Travel Times in Arterial Streets Using Sparse Transit Bus Data," in *Proceedings of IEEE Intelligent Transportation Systems Conference*, Qingdao, China, 2014

C29. Y. Parvini, J. Siegel, A. Stefanopoulou, and A. Vahidi, "Preliminary Results on Identification of an Electro-Thermal Model for Low Temperature and High Power Operation of Cylindrical Double Layer Ultracapacitors, " in

Proceedings of American Control Conference, Portland, OR, 2014.

C28. N. Wan, A. Fayazi, H. Saeedi, and A. Vahidi, "Optimal Power Management of an Electric Bicycle based on Terrain Preview and Considering Human Fatigue Dynamics," in *Proceedings of American Control Conference*, Portland, OR, 2014.

C27. N. Wan, G. Gomes, A. Vahidi, R. Horowitz, "Prediction on Travel-Time Distribution for Freeways Using Online Expectation Maximization Algorithm," in *Proceedings of Transportation Research Board*, Washington, DC, 2014.

C26. A. Fayazi, N. Wan, S. Lucich, A. Vahidi, and G. Mocko, "Optimal Pacing in a Cycling Time-Trial Considering Cyclist's Fatigue Dynamics," in *Proceedings of American Control Conference*, Washington, DC, 2013.

C25. Y. Parvini and A. Vahidi, "Optimal Charging of Ultracapacitors During Regenerative Braking," in *Proceedings of IEEE International Electric Vehicle Conference*, Greenville, SC, 2012.

C24. G. Mahler and A. Vahidi, "Reducing Idling at Red Lights Based on Probabilistic Prediction of Traffic Signal Timings," *Proceedings of American Control Conference*, Montreal, Canada, 2012.

C23. C. Zhang and A. Vahidi, "Model Predictive Cruise Control with Probabilistic Constraints for Eco Driving," *Proceedings of the 2011 ASME DSCC Conference*, Arlington, VA, 2011.

C22. H. Borhan, W. Liang, A. Vahidi, A. Phillips, M. Kuang, S. Di Cairano, and R. McGee "Nonlinear Model Predictive Control of a Power-split Hybrid Electric Vehicle with Battery and Engine Dynamics," *Proceedings of the ASME DSCC Conference*, Arlington, VA, 2011.

C21. S. Schepmann and A. Vahidi, "Heavy Vehicle Fuel Economy Improvement Using Ultracapacitor Power Assist and Preview-based MPC Energy Management," *Proceedings of American Control Conference*, San Francisco, 2011.

C20. H. Borhan, C. Zhang, A. Vahidi, T. Phillips, M. Kuang, and S. Di Cairano, "Nonlinear Model Predictive Control for Power-split Hybrid Electric Vehicles," *Proceedings of Conference on Decision and Control*, Atlanta, GA, 2011.

C19. B. Asadi, C. Zhang and A. Vahidi, "The Role of Traffic Flow Preview For Planning Fuel Optimal Vehicle Velocity," in *Proceedings of ASME Dynamic Systems and Control Conference*, Boston, MA, 2010.

C18. C. Zhang and A. Vahidi, "Real-Time Optimal Control of Plug-in Hybrid Vehicles with Trip Preview," *Proceedings of American Control Conference*, Baltimore, MD, 2010.

C17. H. Borhan and A. Vahidi, "Model Predictive Control of a Power-split Hybrid Electric Vehicle with Combined Battery and Ultracapacitor Energy Storage," *Proceedings of American Control Conference*, Baltimore, MD, 2010.

C16. C. Zhang, A. Vahidi, X. Li, and D. Essenmacher, "Role of Trip Information Preview in Fuel Economy of Plug-in Hybrid Vehicles," *Proceedings of ASME Dynamic Systems and Control Conference*, Hollywood, CA, 2009.

C15. C. Zhang, A. Vahidi, P. Pisu, X. Li, and K. Tennant, "Utilizing Road Grade Preview for Increased Fuel Economy of Hybrid Vehicles," *Proceedings of IFAC Symposium on Control in Transportation Systems*, Redondo Beach, CA, 2009.

C14. B. Asadi and A. Vahidi, "Predictive Use of Traffic Signal State for Fuel Saving," *Proceedings of 12th IFAC Symposium on Control in Transportation Systems*, Redondo Beach, CA, 2009.

C13. H. Borhan, A. Vahidi, T. Phillips, M. Kuang, and I. Kolmanovsky, "Predictive Energy Management of a Power-Split Hybrid Electric Vehicle," *Proceedings of American Control Conference*, St. Louis, MO, 2009.

C12. W. Greenwell and A. Vahidi, "Experiments in Predictive Coordination of a Fuel Cell/Ultracapacitor Hybrid," *Proceedings of ASME Dynamic Systems and Control Conference*, Ann Arbor, MI, 2008.

C11. D. Rotenberg, A. Vahidi, and Ilya Kolmanovsky, "Ultracapacitor Assisted Powertrains: Modeling, Control, Sizing, and The Impact on Fuel Economy," *Proceedings of American Control Conference*, Seattle, WA, 2008.

C10. A. Vahidi, and W. Greenwell, "A Decentralized Model Predictive Control Approach to Power Management of a Fuel-Cell Ultracapacitor Hybrid," *Proceedings of American Control Conference*, New York, NY, 2007.

C9. M. McIntyre, A. Vahidi, and D. Dawson, "An Online Estimator for Heavy Vehicle's Mass and Road Grade," *Proceedings of ASME Dynamic Systems and Control Division*, Chicago, IL, 2006.

C8. A. Vahidi, I. Kolmanovsky, and A. Stefanopoulou, "Constraint Management in Fuel Cells: A Fast Reference Governor Approach," *Proceedings of American Control Conference*, Portland, OR, 2005.

C7. A. Vahidi, A. Stefanopoulou, and H. Peng, "Adaptive Model Predictive Control for Vehicle Braking Assist System Design," *Proceedings of ASME Dynamic Systems and Control Division*, Anaheim, CA, 2004.

C6. A. Vahidi, A. Stefanopoulou, and H. Peng, "Model Predictive Control for Starvation Prevention in a Fuel Cell System," *Proceedings of American Control Conference*, Boston, MA, 2004.

C5. A. Vahidi, A. Stefanopoulou, and H. Peng, "Experiments for Online Estimation of Heavy Vehicle's Mass and Time-Varying Road Grade," *Proceedings of ASME Dynamic Systems and Control Division*, Washington, DC, 2003.

C4. A. Vahidi, M. Druzhininia, A. Stefanopoulou, and H. Peng, "Simultaneous Mass and Time-Varying Grade Estimation for Heavy Duty Vehicles," *Proceedings of American Control Conference*, Denver, CO, 2003.

C3. A. Vahidi and A. Eskandarian, "A Study on the Effect of Preview Uncertainties in Preview Control of Vehicle Suspensions," *ASME Design Engineering Division DE*, New York, NY, 2001.

C2. A. Vahidi, and A. Eskandarian, "Predictive Control of Vehicle Suspensions with Time-Delay for a Quarter Car Model," *Proceedings of Multi-Body Dynamics: Monitoring and Simulation Techniques*, pp. 97-105, 2000.

C1. A. Joghataie and A. Vahidi, "Neural Networks in the Control of Water Towers," *Proceedings of the Artificial Neural Networks in Engineering*; pp. 733-738, 1999.

Abstracts

A1. G. Klapthor,, R. Hutchison, K. Edwards, K. Knowles, K. Humes, G. Mocko, A. Vahidi, "Validity And Reliability Of A Pedal-based Power Meter During Maximal Ergometer Testing," *ACSM Medicine and Science in Sports and Exercise*, **48** (5), pp. 107, 2016.

A2. R. Hutchison, G. Klapthor, K. Knowles, K. Edwards, K. Humes, G. Mocko, A. Vahidi, "Comparison Of Ventilatory Thresholds Via V-slope Method to Lactate Thresholds With NIRS," *ACSM Medicine and Science in Sports and Exercise*, **48** (5), pp. 107, 2016.

A3. K. Edwards, R. Hutchison, G. Klapthor, K. Knowles, G. Mocko, A. Vahidi, K. Humes, M. Murr, "Comparison of Threshold Determinations between Blood Lactate Samples and Near Infrared Spectroscopy," *ACSM Medicine and Science in Sports and Exercise*, **48** (5), pp. 434, 2016.

Other Publications

M4. A. Vahidi, "Constrained Optimal Control Applied to Fuel Cells and Vehicle Systems," Ph.D. Dissertation, University of Michigan, 2005.

M3. A. Vahidi, A. Stefanopoulou, X. Wang, and T.-C. Tsao, "Experimental Verification of Discretely Variable Compression Braking Control for Heavy Duty Vehicles," PATH Technical Report, UC Berkeley, 2004.

M2. A. Vahidi, A. Stefanopoulou, P. Farias, and T.-C. Tsao, "Experimental Verification of Discretely Variable Compression Braking Control for Heavy Duty Vehicles," PATH Technical Report, UC Berkeley, 2003.

M1. A. Vahidi, "Active Vibration Control of Water Towers under Earthquake Loading," Master's Thesis, Sharif University of Technology, Tehran, Iran, 1998. (in Persian)

PATENTS

1. A. Vahidi and G. Mahler, "System and Method for Utilizing Traffic Signal Information for Improving Fuel Economy and Reducing Trip Time," *US Patent 8,478,500*, 2013.

2. G. Mahler, A. Winckler, A. Vahidi, A. Luckow, "Systems and Methods for Predicting Traffic Signal Information*," US Patent 8,972,145*, 2015.

3. A. Vahidi, A. Fayazi, G. Mahler, A. Winckler, "Systems and Methods for Estimating Traffic Signal Information," *US Patent 9,183,743*, 2015.

4. T. Ard, A. Vahidi, A. Borhan, "Apparatuses, Methods, and Systems of Controlling Vehicle Platoons," *US Provisional Patent*, 2023.

INVITED PRESENTATIONS

P49. "Energy and Flow Effects of Optimal Automated Driving in Mixed Traffic," University of California, Irvine, Department of Mechanical and Aerospace Engineering, October 27, 2023

P48. "Energy and Flow Effects of Optimal Automated Driving in Mixed Traffic," University of Southern California, Department of Electrical and Computer Engineering, October 13, 2023

P47. "Efficient Driving with Automated and Connected Vehicles: Algorithms, Microsimulations, and Cyber-physical Experiments," IEEE Workshop on Intelligent Transportation Systems, Tysons Corner, VA, October 27, 2022.

P46. "Efficient Driving with Automated and Connected Vehicles: Algorithms, Microsimulations, and Cyber-physical Experiments," online, General Motors Global Research and Development, March 28, 2022.

P45. "Optimal Control for Motion Planning of Automated Vehicles," online, Michigan State University, October 6, 2021.

P44. "Optimal Automated Driving in Mixed Traffic," online, PTV Talks, April 20, 2021.

P43. "Energy and Flow Effects of Optimal Automated Driving in Mixed Traffic," online, Johannes Kepler University, Linz, Austria, January 11, 2021.

P42. "Energy and Flow Effects of Optimal Automated Driving in Mixed Traffic," online, New York University, Abu Dhabi, November 8, 2020.

P41. "Vehicle-in-Loop Experiments of Optimal Automated Driving in Mixed Traffic" PTV Group North America, Virtual Webinar, October 15, 2020.

P40. "Efficient Driving Leveraging Cellular Connectivity," virtual, Qualcomm, San Diego, CA, September 28, 2020.

P39. "Anticipative Guidance of Connected and Autonomous Cars for Energy Efficiency," Workshop on Emerging Control of Vehicular Traffic for Improving Sustainability and Energy Efficiency, Society of Instrument and Control Engineers (SICE) Annual Conference, Chiang Mai, Thailand, September 23, 2020.

P38. "Anticipative Guidance of Connected and Autonomous Cars for Energy Efficiency," University of Illinois, Chicago, January 28, 2020.

P37. "Eco Driving with Connected and Automated Vehicles", Workshop on Connected and Automated Vehicles for Energy Efficiency and Environment Impact, IFP Energies Nouvelles, Rueil-Malmaison, France, September 30, 2019.

P36. "Anticipative Guidance of Connected and Autonomous Cars for Energy Efficiency" IDETC-CIE, Anaheim, CA, August 2019.

P35. "Opportunities for Efficient Driving with CAVs and Their Network-wide Impact" NSF Workshop on Control for Networked Transportation Systems, Philadelphia, PA, July 8-9, 2019.

P34. "Eco-driving with Connected and Automated Vehicles: Algorithms and Experiments" 3rd IAVSD Workshop on Dynamics of Road Vehicles: Connected and Automated Vehicles, University of Michigan, Ann Arbor, April 28, 2019.

P33. "Coordinating Connected Cars and Signals in Smart Cities" Distinguished Speaker Series, US DOT Center for Connected Multimodal Mobility, Clemson, SC, March 28, 2019.

P32. "Eco-Driving with Connected and Automated Vehicles", ASME DSCC, Workshop on Connected and Automated Vehicles, Atlanta, GA, September 30, 2018.

P31. "Anticipative Guidance of Connected and Autonomous Cars for Energy Efficiency", Ford Motor Company, Research and Advanced Engineering, May 17, 2018.

P30. "Optimal Coordination of Connected and Autonomous Cars in Smart Cities", New York University, Abu Dhabi, November 19, 2017.

P29. "Optimal Coordination of Connected and Autonomous Cars in Smart Cities", University of California, Berkeley, November 3, 2017.

P28. "Eco Driving with Connected and Automated Vehicles", IFP Energies Nouvelles - Technology, Computer Science, and Applied Mathematics Division, Rueil-Malmaison, France, June 1, 2017.

P27. "Efficient Vehicular Mobility Via Connectivity and Control", Control Seminar Series, University of Michigan, Ann Arbor, March 31, 2017.

P26. "Coordinating Connected Cars and Signals in Smart Cities", Winter School on Intelligent Transportation, Singapore, January 17, 2017.

P25. "Coordinating Connected Cars and Signals in Smart Cities", Smart Cities Workshop, IEEE Conference on Decision and Control, Las Vegas, NV, December 11, 2016.

P24. "Opportunities for Increasing Fleet Energy Efficiency with Connected and Autonomous Cars," Research and Innovation Center, Ford Motor Company, May 24, 2016.

P23. "Driver Decision Support For Improving Energy Efficiency of Connected Cars and The Impact on Arterial Traffic," Institute for Pure and Applied Mathematics, University of California, Los Angeles, November 17, 2015.

P22. "Increasing The Energy Efficiency of Connected Cars," Department of Mechanical and Aerospace Engineering, George Washington University, Washington DC, October 2, 2015.

P21. "Increasing The Energy Efficiency of Connected Cars," Department of Electrical And Computer Engineering, University of Maryland, College Park, October 10, 2014.

P20. "Constrained Optimal Control of Automotive Systems," Department of Mechanical and Aerospace Engineering, University of California, Davis, California, November 5, 2013.

P19. "Eco-driving via Connected Vehicle Technologies," IEEE International Sustainable Mobility and Connected Vehicle Leadership Forum, Santa Clara, California, October 23, 2013

P18. "Optimization-based Energy Management of Hybrid Powertrains," Eaton Corporation Global Research and Technology, Southfield, Michigan, June 4, 2013.

P17. "Traffic and Terrain Preview for Energy Saving of Connected Vehicles," BMW Group Technology Office USA, Mountain View, California, July 12, 2012.

P16. "Predictive Use of Upcoming Traffic Signal Information for Improving Fuel Economy," Innomobility 2011.

P15. "Role of Traffic and Terrain Preview in Energy Saving of Connected Vehicles," ITS Georgia Annual Meeting, Greensboro, Georgia, September 19, 2011.

P14. "Saving Energy by Data Sharing and Computing on the Cloud," Annual IEEE Vehicular Technology Meeting, Vehicles in the Cloud Panel, San Francisco, September 8, 2011.

P13. "A Cyberphysical Framework for Increasing Energy Efficiency and Mobility of Networked Vehicles," Department of Mechanical Engineering, University of Texas, Austin, November 5, 2010.

P12. "A Cyberphysical Framework for Increasing Energy Efficiency and Mobility of Networked Vehicles," Department of Mechanical And Aerospace Engineering, University of California, Irvine, October 29, 2010.

P11. "Predictive Energy Management in Networked Vehicles: Utilizing Traffic and Terrain Preview for Fuel Saving," Department of Mechanical Engineering, Georgia Institute of Technology, Atlanta, September 24, 2010

P10. "Predictive Energy Management in Networked Vehicles: Utilizing Traffic and Terrain Preview for Fuel Saving," Control Seminar Series, University of Michigan, Ann Arbor, December 4, 2009.

P9. "Energy Savings in Networked Vehicles by Exploiting Traffic, Traffic Signal, and Terrain Information", BMW Information Technology Research Center, Greenville, South Carolina, June 15, 2009.

P8. "Role of System Engineering and Telematics in Energy Management of Next generation Hybrid Vehicles" Clemson University International Center for Automotive Research, January 14, 2009.

P7. "Role of System Engineering and Telematics in Energy Management of Next Generation hybrid Vehicles" Department of Mechanical Engineering, University of North Carolina, Charlotte, October 30, 2008.

P6. "Overview on Modeling and Control of Hybrid Electric Powertrains" Tutorial Presentation, American Control Conference, Seattle, WA, June 11, 2008.

P5. "Control Engineering of Fuel Cell Systems" Invited Panel, Fuel Cell South Meeting, Atlanta, GA, December 2006.

P4. "Model Predictive Control for Controlling the Air Supply System in a Hybrid Fuel Cell System" Scientific Research Lab, Ford Motor Company, Dearborn, Michigan, July 14, 2004.

P3. "Fuel Cell Control for Automotive Applications: Computational and Real-Time Perspectives" National Instrument/ACTC Automotive Workshop, Dearborn, Michigan, February 7, 2005.

P2. "Power and Constraint Management in Fuel Cells" The Wilson Center for Research and Technology", Xerox Corporation, Webster, New York, March 24, 2005.

P1. "Coordination of Propulsion Systems in Vehicles" General Motors, Warren, Michigan, April 1, 2005.

SPONSORED RESEARCH

S22. "ENACTED: Energy-Efficient Automated Connected Cars Demonstration" US Department of Energy through Argonne National Lab, PI (50%), ($150K/year for 3 years), (4/1/2024-3/30/2027)

S21. "Immersing Humans and Automated Vehicles in Augmented Reality Traffic for Energy Impact Evaluation: Development of Theory, Tools, and Experimental Platform" US Department of Energy through Argonne National Lab, Smart 2.0, PI (55%), $750K, (4/1/2021-8/31/2024)

S20. "Energy Management of Multi-Scale Autonomous Vehicles", US Department of Defense, Ground Vehicle Systems Center, Co-PI (25%) $1.8M, (7/01/2020-12/31/2023)

S19. "Optimal Scheduling of Automated Delivery Train Movements Across BMW Manufacturing Plant," BMW, PI (100%), $50,000, (1/1/2020-3/31/2020)

S18. Clemson Vice President of Research Postdoctoral Support Grant for Automated Vehicle Research, PI (100%), $71,900 (9/1/2019-12/31/2020)

S17. "Advancing Platooning with Automated Driver Assist Systems," US Department of Energy, Sole University PI (100%) $364,393 (Led by Cummins Inc, Total Federal Funding: $2.5M Federal +$2.5M cost-share) (1/1/2019-12/31/2021)

S16. "Boosting Energy Efficiency of Heterogeneous Connected Automated Vehicle (CAV) Fleets via Anticipative and Cooperative Vehicle Guidance," US Department of Energy, PI (40%) $1,343,193 (9/1/2017-12/31/2019). [More Info]

S15. "Data-Enabled Statistical Prediction of Surrounding Traffic for Automated Driving," BMW, PI (100%), $50,000, (1/1/2018-12/31/2018)

S14. "Improving Energy Efficiency and Mobility of Connected Fleets via Route Preview and Cooperative Control" US Department of Defense, TACOM, PI (100%), $270,747 (7/1/2015-6/30/2018)

S13. "Increased Mobility and Energy Efficiency Enabled by Vehicle to Vehicle and Vehicle to Infrastructure Connectivity" BMW, PI (100%), $133,473, (1/1/2015-12/31/2016)

S12. "Understanding Human Muscle Fatigue Dynamics During Prolonged Exertions" Clemson University Internal Grant, PI (50%, With G. Mocko), $15,000, (3/1/2014-2/28/2015)

S11. "Data-Enabled Estimation and Prediction of the State of Traffic Signals" BMW, PI (100%), $215,873, (1/1/2011-12/31/2014)

S10. "Ultracapacitor Energy Storage for Improving Fuel Economy and Extending Battery Life in Heavy Vehicles" US Department of Defense, TACOM, PI (100%), $257,885 (6/1/2011-6/30/2015)

S9. "Predictive Energy Management in Smart Vehicles: Exploiting Traffic and Terrain Preview for Fuel Saving" National Science Foundation (CMMI-0928533), PI (100%), $260,000, (8/1/2009-7/31/2013)

S8. "Utilizing 3D Aerial Terrain Maps for Improving Energy Management of Hybrid Vehicles" US Department of Defense, TACOM, PI (55%), $84,000 (8/15/2008-8/15/2010)

S7. "Ultracapacitors for Power Boost in Vehicles", US Department of Defense, TACOM, PI (48%), $80,000 (8/15/2008-8/15/2010)

S6. "Ford URP: Optimization-based Control for Advanced Hybrid Powertrain Systems" Ford Motor Company, PI (100%), $120,000, (3/1/2007 - 3/1/2010)

S5. "Online Parameter Estimation for Advanced Control of Heavy Vehicles" Eaton Corporation Research Lab, PI (100%), $80,787 (4/1/2007-7/30/2008)

S4. "Quantifying the Potentials of 3D Road Maps for Improving the Energy Management of Hybrid Electric Vehicles" Intermap Technologies, PI (100%), $59,850 (9/1/2007-8/31/2009)

S3. "Multi-core Computing for Implementation of Advanced Engine Control Algorithms" General Motors Research Lab, co-PI (50%), $43,788, (5/1/2007-11/1/2007)
S2. "Next-Generation Actuation Technologies in Vehicle Control" BMW, PI (100 %), $25,587, (9/1/2006-12/31/2006)

S1. "Ultracapacitors for Power Boost in ICE Vehicles: System Integration, Supervisory Control Design, and Hardware-in-the-loop Experiments" Ford Motor Company, PI (50%), $25,000, (9/1/2006-5/31/2007)

STUDENT ADVISING

Current Graduate Advisees

      1. Viranjan Bhattachariyya (Ph.D.) Research: "Game Theory for Modeling Automated Vehicle Interactions in Mixed Traffic" (August 2021-)

Past Postdoctoral Advisees and Research Associates

      1. Dr. Alireza Fayazi (Postdoc) Research: "Vehicle-in-Loop Testing and Verification for Experimental Connected and Automated Vehicles; Integrating Motion-Control, V2X Communication, and Energy Measurement Systems into Autonomous Test Vehicles via ROS interface" (January 2017-February 2020) Now: Ridecell Automated Driving.

      2. Dr. Judhajit Roy (Postdoc) Research: "Vehicle route guidance on off-road terrains" (January 2016-August 2016) Now: Ford Motor Company

      3. Wenjian Hao (Research Fellow): "Reinforcement Learning for Motion Planning of Off-Road Automated Vehicles" (October 2020-August 2021) Now: Purdue University

Past Graduate Students

      1. Tyler Ard (Ph.D.) Dissertation: "Impacts of Connected and Automated Vehicles on Energy and Traffic Flow: Optimal Control Design and Verification Through Field Testing" (January 2018- December 2023) Now at: Argonne National Lab

      2. Shahab Karimi (Ph.D.) Dissertation: "Deep Reinforcement Learning and Game Theoretic Monte Carlo Decision Process for Safe and Efficient Lane Change Maneuver and Speed Management" (2016-2023) Now at: ZF.

      3. Faraz Ashtiani (Ph.D.) Dissertation: "Optimal Pacing of Cyclists in a Time Trial Based on Experimentally Calibrated Models of Fatigue and Recovery" (January 2016- August 2021) Now at: Tesla.

      4. Austin Dollar (Ph.D.) Dissertation: "Efficient Automated Driving Strategies Leveraging Anticipation and Optimal Control" (September 2016- May 2021) Now at: General Motors.

      5. Alireza Fayazi (Ph.D.) Dissertation: "Connected Vehicles At Signalized Intersections: Arterial Eco-Driving And Traffic Signal Optimization" (August 2011-December 2016). *Finalist and Third Prize: 2017 Best Dissertation Award from IEEE Intelligent Transportation Systems Society*. Now: RideCell.

      6. Yasha Parvini, (Ph.D.) Dissertation: "Modeling, Hybridization, and Optimal Charging of Electrical Energy Storage Systems" (May 2011-August 2016), Now: Associate Professor Oslo Met, Norway.

      7. Nianfeng Wan (Ph.D.) Dissertation: "Estimation and Control of Traffic Relying on Vehicular Connectivity" (August 11- May 16) Now at: NVIDIA.

      8. Judhajit Roy (Ph.D. co-advised with Harry Law) Dissertation: "Design of Cab Suspensions and Semi-active Seat Damping Control Strategies for Tractor Semi-Trailers" Now at: Ford Motor Company

      9. Grant Mahler, (Ph.D.) Dissertation: "Enhancing Energy Efficiency in Connected Vehicles Via Access to Traffic Signal Information" (September 09-November 13) Hired by: BMW Technology Office, California.

      10. Hosseinali Borhan, (Ph.D.) Dissertation: "Optimization-Based Power Management Of Hybrid Power Systems With Applications In Advanced Hybrid Electric Vehicles And Wind Farms," (January 07-July 2011), Now at: Cummins.

11. Chen Zhang, (Ph.D.) Dissertation: "Predictive Energy Management In Connected Vehicles: Utilizing Route Information Preview For Energy Saving," (September 07-December 2010), Now at: Faraday Future.

12. Rob Smith (M.Sc.) Thesis: ": The Effect of Deployment and Optimal Dispatch of Shared Electric Shuttles on the Energy Efficiency of Campus Transit" (June 2021- August 2023)

13. Austin Dollar (M.Sc.) Research Project: "Efficient and Collision-Free Anticipative Cruise Control in Randomly Mixed Strings," (May 2019) Now: General Motors.

14. Angshuman Goswami (M.Sc.) Thesis: "Hierarchical Off-Road Path Planning and Technologies for Its Validation Using a Scaled Autonomous Car," (Sep. 2015-December 2017), Now at: ZF, Michigan.

15. Lei Fan, (M.Sc.) Research Project: "Strategizing The Energy Management Of An Experimental Electric Bicycle" (Sep. 2010-May 2011)

16. Seneca Schepmann, (M.Sc.) Thesis: "Ultracapacitor Heavy Hybrid Vehicle: Model Predictive Control Using Future Information to Improve Fuel Consumption" (Aug. 2009-Aug. 2010) Now at: Proterra Electric Bus Company.

17. Behrang Asadi, (M.Sc.) Thesis: "Predictive Energy Management In Smart Vehicles: Exploiting Traffic And Traffic Signal Preview For Fuel Saving" (August 2007-August 2009) Now at: Head of Advanced Analytics at Danaher Corporation.

18. Wesley Greenwell, (M.Sc.) Thesis: "Real-Time Power Management of A Fuel Cell/Ultracapacitor Hybrid" (July 06 - May 08) Hired by: Michelin USA.

19. Dean Rotenberg, (M.Sc.) Thesis: "Ultracapacitor Assisted Powertrains: Modeling, Control, Sizing, and The Impact on Fuel Economy" (September 06 - July 08) Hired by: Department of Defense- Aberdeen Proving Ground.

20. Saurabh Keni, (M.Sc. co-advised with Mohammed Daqaq) Thesis: "Stability Analysis and Decentralized Control of Coupled Oscillators with Feedback Delays" (September 06 - July 08) Hired by: Caterpillar.

21. Tejas Ghotikar, (M.Sc.) Thesis: "Estimation Of Vehicle Mass And Road Grade" (September 06 - July 08) Now: Assistant Professor, Sardar Vallabhbhai Patel Institute Of Tech, India.

22. Aditya Bhandari, (M.Sc.) Research Project: "Dynamic Programming For Energy Optimization Of Ultracapacitor Hybrids" (September 06 - July 08) Hired by: Caterpillar.

23. Wolfgang Schmittinger, (M.Sc.) Research Project: "A Survey Of Conditions Influencing A PEM Fuel Cell Life" (September 05 - May 07) Hired by: Husky, Luxemburg.

Undergraduate Student Advising

1. Alexander Minnich, (Honor College) "Modeling and Estimation of Fatigue and Recovery During Exercise" (S24-)

2. Sydney Olson, (Honor College) "Human-Robot Interaction in Autonomous Driving" (F23-S24)

3. Chloe Wright, (Honor College) "Modeling and Estimation of Fatigue and Recovery During Exercise" (S23-F23)

4. Adam James Kummetz, (Honor College) "Microsimulation of automated vehicles in urban driving" (S20-Fall20)

5. Arvind Mahadevan, "Virtual reality visualization for automated vehicle testing"(F20)

6. David Gundana, (Honor College) "Optimal Lane Selection for Autonomous Vehicles," (F17-S18)

4. Stefan Topper, "Control of a platoon of connected cars for improved mobility" (S16)

5. Hannah Willingham, "Comparative study of muscle fatigue models" (S16)

6. David Geyer, "Creating a scaled autonomous vehicle: software implementation"(S16)

7. Matthew Chicky, "Creating a scaled autonomous vehicle: hardware assembly" (S16)

8. Robert Hanlin, "Validation of a human muscle fatigue model based on electromyography" (S14)

9. Stephen Lucich, "Modeling muscle fatigue dynamics in cycling" (S12-F12)

10. Zack O'Brien (Honor College), "Wireless control module of an electric bicycle", (F09-S10)

11. Justin Elgin, "Adopting an iPhone as wireless control module of an electric bicycle", (F09)

12. Glenn Milner (Honor College), "Energy harvesting wireless mouse" (S09-F10)

13. Eric Fenimore, "Energy harvesting wireless mouse" (S09)

14. Lance Clark, "Detection of human vital signs via wireless sensors for electric bicycle haptics" (S09)

15. Erica Nasto, "Integration of rider's heart rate in an electric bicycle's control system" (F08-S09)

16. Seneca Schepmann, (Honor College), "Eenergy recuperation mechanism for an electric bicycle" (F07-S08)

17. Carl Eichel, "Development and performance verification of an ultracapacitor hybrid bicycle" (S07 - F08)

18. Maria Koon, "Onboard control algorithms for a hybrid ultracapacitor bicycle" (S07)

19. Tim Stoval, "Development and performance verification of an ultracapacitor hybrid bicycle" (S07)

20. Amir Matlock, "Survey of actuation mechanisms for control of lightweight structures" (F06)

REVIEW ACTIVITIES

<u>Paper Reviews</u>
- IEEE: Trans. on Control Systems Technology, Trans. on Automatic Control, Trans. on Intelligent Transportation Systems, Trans. on Intelligent Vehicles, Trans. on Vehicular Technology, Trans. on Industrial Electronics, Trans. on Mechatronics, Control Systems Letters
- ASME: Journal of Dynamic Systems, Measurement, and Control, Journal of Energy Resources Technology
- IFAC: Automatica, Control Engineering Practice
- Others: Transportation Research Part C, Vehicle System Dynamics, ACM Trans. on Embedded Computing Systems, European Journal of Control
- Conferences: American Control Conference, ASME Dynamics Systems and Control Conference, IEEE Conference on Decision and Control, European Control Conference, IEEE Conference on Control Technology and Applications, IFAC World Congress, IFAC Symposium on Control in Transportation Systems, Transportation Research Board

Undergraduate Courses

Course Number	Course Title	G/UG	Credits	Semester	Number of Students	Review (out of 5)
ME3050	Dynamics Systems	UG	3	F05	27	4.6
				S06	36	4.7
				F07	45	4.3
				F08	35	4.0
				F16	41	4.6
				F17	46	4.2
				F18	44	4.6
				F19	45	4.6
				F20	43	4.5
				S21	59	4.7
				F22	25	4.7
ME4160	Automatic Control	UG	3	F06	26	4.5
				F07	15	3.8
ME4030	Control Systems	UG	3	S09	28	4.3
				F10	41	4.2
				S10	27	4.6
				F13	50	4.3
				S14	38	4.3
				F14	87	4.0
				F15	72	4.1
				F21	80	4.3
				S24	59	4.3

Graduate Courses

Course Number	Course Title	G/UG	Credits	Semester	Number of Students	Review (out of 5)
ME616	Automatic Control	G	3	F06	29	4.9
				F07	22	4.8
ME8200	Modern Control (Linear Systems)	G	3	S07	32	4.4
				S08	22	4.7
				S09	30	4.6
				S10	35	4.6
				S11	13	4.6
				S12	33	4.7
				S16	23	4.4
				S17	49	4.6
				S18	26	4.6
				S20	33	4.7
				S22	36	4.6
				S24	29	4.3
ME8230	First Graduate Course in Control Systems	G	3	F09	20	4.6
				F10	21	4.7
				F11	34	4.8
				F21	6	4.8
				F23	21	4.5
ME8220	Optimal Control	G	3	F09	19	4.5
				S12	13	5.0
				F14	21	4.9
				F16	14	4.9
				F18	32	4.3
				F20	22	4.6
				F22	40	4.3
ME8240	Optimal Estimation	G	3	F13	26	4.7
				S15	13	4.7
				S19	19	4.5
				S23	16	4.4

SELECTED MEDIA COVERAGE

- Greenville News, "Self-driving shuttles coming to Clemson University" (2021)
- Automotive News, "'Ghost' AV research may put the brakes on stop-and-go traffic" (2020)
- Clemson News, "'Ghost' vehicle research shows energy savings in self-driving cars" (2020)
- Upstate Business Journal, "How automotive testing in Greenville could impact tomorrow's roadways" (2019)
- Upstate Business Journal, "How Clemson researchers plan to boost energy efficiency with connected, automated vehicle technology" (2017)
- Greenville News, "Clemson awarded $1.16M to research use of connected, automated vehicle technology to boost energy efficiency" (2017)
- Ars Technica, "The intelligent intersection could banish traffic lights forever" (2017)
- Clemson News, "Lights out: Traffic controller will help cars pass intersections without stopping" (2017)
- Fox Carolina, "Clemson engineers develop device that could eliminate traffic lights altogether" (2017)
- WLOS, "News 13 Investigates: Are cities ready for invisible drivers?" (2017)
- Clemson News, "New terrain in technology" (2014)

Last Updated: May 2024