YAO MA

Phone: (806) 834-8113
Yao.Ma@ttu.edu

Texas Tech University, Box 41021
Lubbock, Texas, 79409

EDUCATION

Ph.D. The University of Texas at Austin, Mechanical Engineering 2019
Advisor: Prof. Junmin Wang
Thesis: Synergistic and Intelligent Control of Vehicle Powertrain-Aftertreatment Systems

M.S. North Carolina State University, Electrical Engineering 2013

B.S. Harbin Institute of Technology, Control Science and Engineering 2012

EXPERIENCE

Texas Tech University, Lubbock 2019 to Present
Assistant Professor, Department of Mechanical Engineering

The University of Texas at Austin, Austin 2018 to 2019
Graduate Research Assistant, Mobility System Lab

The Ohio State University, Columbus 2014 to 2018
Graduate Research Associate, Vehicle System and Control Lab

Mohu Consumer Electronics, Raleigh 2013 to 2014
Electrical Engineer, Product Development

SELECTED PROJECTS

Texas Tech University, Mobility Automation 2019 to Present
- Connected and Autonomous Vehicle in Mixed Traffic
- Driver Behavior Monitoring, Characterization, and Analysis
- Predictive Propulsion and Energy Systems Control for Connected Vehicles

National Science Foundation, Cyber-Physical System: Synergy 2016 to 2018
- Next-generation, personalized, active vehicle safety control systems design with vehicle connectivity technologies
- Interactive driving simulation platform design and implementation with virtual reality and autonomous steering wheel control
- Software user interface and environment design

Tenneco, Inc., Advanced Diesel Engine Aftertreatment System 2014 to 2015
- Setup Engine test cell with the corresponding data acquisition system
- Establish CAN bus-based communication with fast prototype Engine ECU
- Perform experiment calibration of Diesel after treatment system including SCR, DOC, DPF
- Design and implement control algorithms for emission control purpose

PUBLICATIONS

(names of supervised students are printed in *italic*)

Journal Publications

[J8] *Mehmet Fatih Ozkan* and Yao Ma, "Modeling Human Driver Behavior in Car-Following Interactions with Automated and Human-Driven Vehicles and Energy Efficiency Evaluation," IEEE Access, 2021. (In Press)

[J7] *Mehmet Fatih Ozkan* and Yao Ma, "Eco-Driving of Connected and Automated Vehicle with Preceding Driver Behavior Prediction," ASME Journal of Dynamic Systems, Measurement and Control, January 2021; 143(1): 011002. https://doi.org/10.1115/1.4048108

[J6] Yao Ma and Junmin Wang, "Energetic Impacts Evaluation of Eco-Driving on Mixed Traffic with Driver Behavioral Diversity," IEEE Transactions on Intelligent Transportation Systems, 2020. (In Press)

[J5] Yao Ma and Junmin Wang, "Predictive Control for NO_x Emission Reductions in Diesel Engine Vehicle Platoon Application," IEEE Transactions on Vehicular Technology, vol. 68, no. 7, pp. 6429-6440, July 2019. (DOI: 10.1109/TVT.2019.2914062)

[J4] Yao Ma and Junmin Wang, "Sliding-mode Control of Automotive Selective Catalytic Reduction Systems with State Estimation," Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering, 2019. (DOI: 10.1177/0954407019853968)

[J3] Yao Ma and Junmin Wang, "Integrated Power Management and Aftertreatment System Control for Hybrid Electric Vehicles with Road Grade Preview," IEEE Transactions on Vehicular Technology, Vol. 66, Issue 12, pp. 10935-10945, 2017 (DOI: 10.1109/TVT.2017.2763587).

[J2] Yao Ma and Junmin Wang, "Control of Aged Automotive Selective Catalytic Reduction Systems for Consistent Performances," Journal of the Franklin Institute, Vol. 354, Issue 18, pp. 8094-8116, 2017 (DOI: 10.1016/j.jfranklin.2017.10.003).

[J1] Yao Ma and Junmin Wang, "Observer-based Estimation of Aging Condition for Selective Catalytic Reduction Systems in Vehicle Applications," ASME Journal of Dynamic Systems, Measurement and Control, Vol. 139, No. 2, 021002 (9 pages), 2017 (DOI: 10.1115/1.4034508).

Peer-Reviewed Conference Publications

[C13] *Mehmet Fatih Ozkan, Abishek J. Rocque,* and Yao Ma, "Inverse Reinforcement Learning Based Stochastic Driver Behavior Learning," IFAC Modeling, Estimation, and Control Conference (MECC), 2021. (Under Review)

[C12] *Mehmet Fatih Ozkan* and Yao Ma, "Fuel-Economical Distributed Model Predictive Control for Heavy-Duty Truck Platoon," IEEE International Intelligent Transportation Systems Conference (ITSC), 2021. (Accepted)

[C11] Yao Ma, Donald J. Docimo, and Victor Maldonado, "Preliminary Design and Dynamics of a Semi-Expendable Unmanned Ground-Aerial Vehicle", AIAA AVIATION Forum and Exposition, 2021. (Accepted)

[C10] *Mehmet Fatih Ozkan* and Yao Ma, "Personalized Adaptive Cruise Control and Impacts on Mixed Traffic," Proceedings of the 2021 American Control Conference, 2021. (**ASME Automotive and Transportation System Best Paper Finalist**)

[C9] *Mehmet Fatih Ozkan* and Yao Ma, "Inverse Reinforcement Learning based Driver Behavior Analysis and Fuel Economy Assessment," Proceedings of the 2020 Dynamic Systems and Control Conference, 2020.

[C8] *Mehmet Fatih Ozkan* and Yao Ma, "A Predictive Control Design with Speed Previewing Information for Vehicle Fuel Efficiency Improvement," Proceedings of the 2020 American Control Conference, 2020.

[C7] Yao Ma and Junmin Wang, "A Predictive Control Method for Automotive Selective Catalytic Reduction Systems," Proceedings of the 2019 American Control Conference, 2019.

[C6] Pingen Chen and Yao Ma, "Model Predictive NO_x Emission Control for a Biodiesel Engine Coupled with A Urea-based Selective Catalytic Reduction System." SAE Technical Paper, SAE World Congress, 2019.

[C5] Yao Ma and Junmin Wang, "A Study on Economical Vehicle Platooning Strategy in Urban Driving Scenarios," Proceedings of the 2018 IEEE Vehicle Power and Propulsion Conference, 2018.

[C4] Yao Ma and Junmin Wang, "Model Based Control of Automotive Selective Catalytic Reduction Systems with Road Grade Preview," Proceedings of the 2018 American Control Conference, 2018.

[C3] Yao Ma and Junmin Wang, "Sliding-mode Control of Ammonia Coverage Ratio for Automotive Selective Catalytic Reduction Systems," Proceedings of the 2018 American Control Conference, 2018.

[C2] Yao Ma and Junmin Wang, "A Control Method for Consistent Performance of Automotive Selective Catalytic Reduction Systems under Variant Aging Conditions," Proceedings of the 2016 American Control Conference, pp. 4187-4192, 2016.

[C1] Yao Ma and Junmin Wang, "Model-based Selective Catalytic Reduction Systems Aging Estimation," Proceedings of the 2016 IEEE International Conference on Advanced Intelligent Mechatronics, pp. 1521-1526, 2016.

Patents

[P1] Victor Maldonado**,**Yao Ma, and Donald J. Docimo, Reconfigurable Unmanned Vehicle, U.S. Provisional Application No. 63/128750, December 21, 2020 (Pending)

PRESENTATIONS AND INVITED TALKS

[T7] Driving the Future: Self-Driving Cars and Applications, Invited Talk at Texas Tech University IEEE Student Branch, Lubbock, TX, March 2020

[T6] A Predictive Control Method for Automotive Selective Catalytic Reduction Systems, Oral Presentation at American Control Conference, Philadelphia, PA, July 2019.

[T5] Synergistic and Intelligent Control of Vehicle Powertrain-Aftertreatment Systems, Invited Talk at Tennessee Technological University, Cookeville, TN, February 2019

[T4] Synergistic and Intelligent Control of Vehicle Powertrain-Aftertreatment Systems, Invited Talk at Texas Tech University, Lubbock, TX, February 2019

[T3] Model Based Control of Automotive Selective Catalytic Reduction Systems with Road Grade Preview, Oral Presentation at American Control Conference, Milwaukee, WI, July 2018.

[T2] Sliding-mode Control of Ammonia Coverage Ratio for Automotive Selective Catalytic Reduction Systems, Oral Presentation at American Control Conference, Milwaukee, WI, July 2018.

[T1] A Control Method for Consistent Performance of Automotive Selective Catalytic Reduction Systems under Variant Aging Conditions, Oral Presentation at American Control Conference, Boston, MA, July 2016.

TEACHING & MENTORING

Texas Tech University, Lubbock 2019 to Present
Instructor, Department of Mechanical Engineering
- ME 4334 Control of Dynamic Systems, Evaluations: Fall 2019: 4.6/5; Spring 2020: 4.6/5; Fall 2020: 4.1/5 (Online); Spring 2021: 4.5/5
- ME 5312 Control Theory I
- ME 4331 Individual Study in Mechanical Engineering: Scaled Autonomous Vehicle Design and Control
- ME 5120 Graduate Seminar

Thesis Advisor, Department of Mechanical Engineering
- One Ph.D. Student, Aug 2023 (Expected)
- One M.S. Student, May 2021

The University of Texas at Austin, Austin 2019
Teaching Assistant, Walker Department of Mechanical Engineering
- Course ME 340 Mechatronics

The Ohio State University, Columbus 2017
Guest Lecturer, Department of Mechanical and Aerospace Engineering
- Course ME 3260 System Dynamics and Vibrations

North Carolina State University, Raleigh 2013
Teaching Assistant, Department of Electrical Engineering
- Course Robotics featuring Scaled Autonomous Vehicle
- Supervise lab experiment

SERVICE

Peer-Reviewed Articles for:
- ASME Journal of Dynamic Systems, Measurement and Control
- ASME Journal of Engineering for Gas Turbines and Power
- ASME Letters in Dynamic Systems and Control
- American Control Conference (ACC)
- Advances in Mechanical Engineering
- Automotive Innovation
- Dynamic Systems and Control Conference (DSCC)
- IEEE/ASME Transaction on Mechatronics
- IEEE Access
- IEEE Control Systems Letters
- IEEE Conference on Decision and Control (CDC)
- IEEE International Conference on Intelligent Transportation Systems (ITSC)
- IEEE Transaction on Intelligent Transportation
- IEEE Transaction on Industrial Electronics
- IEEE Transaction on Transportation Electrification
- IEEE Transaction on Vehicular Technology
- IEEE Vehicular Technology Magazine
- International Journal of Energy Research
- International Journal of Vehicle Design

- Journal of the Franklin Institute
- Journal of Vibration and Control
- Nonlinear Dynamics
- SAE World Congress Experience (WCX™)
- Transportation Research Part C: Emerging Technologies

Conferences Services:
- Session Chair, 2020 Dynamic Systems and Control Conference (DSCC)
- Invited Session Organizer, 2021 American Control Conference (ACC)
- Invited Session Organizer, 2021 Modeling, Estimation, and Control Conference (MECC)

Editorship Services:
- Associate Editor, IEEE Transaction on Vehicular Technology
- Associate Editor, 2020 Dynamic Systems and Control Conference (DSCC)
- Associate Editor, 2021 American Control Conference (ACC)

Grant Review:
- Panelist, 2021 National Science Foundation
- Panelist, 2021 NSF ENG CAREER Workshop

Professional Membership:
- The American Society of Mechanical Engineers (ASME), Member
- ASME Automotive and Transportation System Technical Committee, Member
- Institute of Electrical and Electronics Engineers (IEEE), Member
- IEEE Control Systems Society (CSS), Member
- IEEE CSS Technical Committee on Intelligent Control (TCIC), Member
- IEEE Vehicular Technology Society, Member
- IEEE Intelligent Transportation Systems Society, Member
- Society of Automobile Engineers (SAE), Member

Synergistic Activities:
- Organizer and Host, ASME Dynamic Systems & Control Division Interview Series
- Judge, South Plains Regional Science and Engineering Fair (K-12 Students), Texas Tech University
- Instructor, WiE (Women in Engineering) and MEP (Minority Engineering Program) RISEng STAR, College of Engineering, Diversity, Outreach & Inclusion Office, The Ohio State University
- Teaching Assistant, 2013 Engineering Summer Camp (High School Students), North Carolina State University

SELECTED AWARDS

ASME Automotive and Transportation System Technical Committee 2021
Finalist, Best Paper in American Control Conference

Texas Tech University 2019
Nominee, 2020 ORAU Ralph E. Powe Junior Faculty Enhancement Awards

The University of Texas at Austin 2018
Recipient, Advance Teaching Certificate by Faculty Innovation Center

American Control Conference Committee 2016, 2018
Recipient, Student Travel Award

Harbin Institute of Technology 2008-2010
Recipient, People's Scholarship

STUDENTS AWARDS

Texas Tech University
Mehmet Ozkan, Community of Scholars, Leadership And Mentorship Program, 2020
Shailesh Rao, Undergraduate Research Scholars, Honors College, 2020
Bibek Dhungana, Undergraduate Research & Creative Activities Project Funding, 2021