YAO MA

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Texas Tech University, Box 41021
Lubbock, Texas, 79409

EDUCATION

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

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

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

EXPERIENCE

Texas Tech University, Lubbock — 2019 to Present
Assistant Professor, Department of Mechanical Engineering
- Instructor, ME 4334-003 Control of Dynamic System
- Director, Mobility Automation Lab

The University of Texas at Austin, Austin — 2018 to 2019
Graduate Research Assistant, Mobility System Lab
- Evaluation and control design of Connected Autonomous Vehicle for energy efficiency and mobility improvement of the transportation system
- Optimization of vehicle energy and emission performance with autonomy, connectivity and driver characteristics

The Ohio State University, Columbus — 2014 to 2018
Graduate Research Associate, Vehicle System and Control Lab
- Modeling, control, and estimation of automotive engine, powertrain, and aftertreatment system
- Optimization and control of hybrid vehicle power management systems

Mohu Consumer Electronics, Raleigh — 2013 to 2014
Electrical Engineer, Product Development
- Board-Level analog circuit design, prototype, and manufacture

SELECTED PROJECTS

Texas Tech University, Mobility Automation — Aug 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 — Aug 2016 to Aug 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 Aug 2014 to Aug 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, "Eco-Driving with Time Series-based Speed Prediction for Connected and Automated Vehicle," ASME Transactions Journal of Dynamic Systems, Measurement and Control, 2020. (Under Review)

[J7] Yao Ma and Junmin Wang, "Personal Driving Behavior Characterization and Impacts on Fuel Economy over Frequent Commute Routes," IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2020. (Under Review)

[J6] Yao Ma and Junmin Wang, "Eco-Driving of Connected and Automated Vehicle and Impacts on Human-Driven Fleets," IEEE Transactions on Intelligent Transportation Systems, 2019. (Under Review)

[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 Transactions Journal of Dynamic Systems, Measurement and Control, Vol. 139, No. 2, 021002 (9 pages), 2017 (DOI: 10.1115/1.4034508).

Peer-Reviewed Conference Publications

[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. (Accepted)

[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. (Accepted)

[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.

PRESENTATIONS AND INVITED TALKS

[P7] Driving the Future: Self-Driving Cars and Applications, Invited Talk at Texas Tech University IEEE Student Branch, Lubbock, TX, March 2020

[P6] A Predictive Control Method for Automotive Selective Catalytic Reduction Systems, Oral Presentation at American Control Conference, Philadelphia, PA, July 2019.

[P5] Synergistic and Intelligent Control of Vehicle Powertrain-Aftertreatment Systems, Invited Talk at Tennessee Technological University, Cookeville, TN, February 2019

[P4] Synergistic and Intelligent Control of Vehicle Powertrain-Aftertreatment Systems, Invited Talk at Texas Tech University, Lubbock, TX, February 2019

[P3] Model Based Control of Automotive Selective Catalytic Reduction Systems with Road Grade Preview, Oral Presentation at American Control Conference, Milwaukee, WI, July 2018.

[P2] Sliding-mode Control of Ammonia Coverage Ratio for Automotive Selective Catalytic Reduction Systems, Oral Presentation at American Control Conference, Milwaukee, WI, July 2018.

[P1] 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 — Aug 2019 to Present
Instructor, Department of Mechanical Engineering
- Course ME 4334 Control of Dynamic Systems
- Evaluations: Fall 2019: 4.6/5; Spring 2020: 4.6/5

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

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

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

North Carolina State University, Raleigh Jun 2013 to Aug 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 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 International Conference on Intelligent Transportation Systems (ITSC)
- IEEE Transactions on Intelligent Transportation
- IEEE Transaction on Industrial Electronics
- IEEE Transactions on Transportation Electrification
- IEEE Transactions on Vehicular Technology
- International Journal of Energy Research
- International Journal of Vehicle Design
- Journal of the Franklin Institute
- Nonlinear Dynamics
- Transportation Research Part C: Emerging Technologies

Editorship:
- Associate Editor, Proceedings of the 2020 Dynamic Systems and Control Conference (DSCC)

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, Member
- IEEE Vehicular Technology Society, Member
- IEEE Intelligent Transportation Systems Society, Member
- Society of Automobile Engineers (SAE), Member

Outreach Activities:
- Judge, South Plains Regional Science and Engineering Fair (K-12 Students), Texas Tech University
- Instructor, WiE (Women in Engineering) RISEng STAR, College of Engineering, Diversity, Outreach & Inclusion Office, The Ohio State University

- Instructor, 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

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