# YAO MA

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## EDUCATION

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|---|---|---|
| **Ph.D.** | The University of Texas at Austin, Mechanical Engineering | May 2019 |
| **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**, Intelligent Mobility System 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 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

## GRANT PROPOSAL

**Texas Department of Transportation** Sep 2018
Graduate Research Assistant
- Connected Vehicle Platooning Optimization for Emissions and Energy Consumption Reduction
- Draft proposal and assist Principal Investigator in the grant application

**ORAU Ralph E. Powe Junior Faculty Enhancement Awards** Dec 2019
(Under Review, Limited submission nominated by Texas Tech University)
Principal Investigator
- Integrated Control and Optimization of Connected and Automated Vehicles for Efficient and Sustainable Mobility in Mixed Traffic

## PUBLICATIONS

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

***Journal Publications***

[J7] *Mehmet Fatih Ozkan* and Yao Ma, "Eco-Driving with Time Series-based Speed Prediction for Connected and Automated Vehicle," IEEE Transactions on Vehicular Technology, 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***

[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

[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 (49 students)

**Thesis Adviser**, Department of Mechanical Engineering
- Mehmet Ozkan, Ph.D. Student, Aug 2023 (Expected)
- Abishek Joseph Rocque, M.S. Student, Aug 2021 (Expected)
- Truong Dinh, M.S. Student, Aug 2020 (Expected)

**The University of Texas at Austin**, Austin — Jan 2019 to May 2019
**Teaching Assistant**, Walker Department of Mechanical Engineering
- Course ME 340 Mechatronics (100 students)

**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
- Advances in Mechanical Engineering
- Automation Innovation
- IEEE/ASME Transaction on Mechatronics
- IEEE Access
- IEEE Control Systems Letters
- IEEE Transactions on Intelligent Transportation
- IEEE Transaction on Industrial Electronics
- IEEE Transactions on Vehicular Technology
- International Journal of Vehicle Design
- Journal of the Franklin Institute
- Nonlinear Dynamics
- Transportation Research Part C: Emerging Technologies
- Proceedings of the American Control Conference (2017-2020)

**Editorship:**
- Associate Editor, Proceedings of the 2020 Dynamic Systems and Control Conference

**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:**
- 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
- Judge, South Plains Regional Science and Engineering Fair (K-12 Students), Texas Tech 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