

# YAO MA

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Texas Tech University, Box 41021  
Lubbock, Texas, 79409

## EDUCATION

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| <b>Ph.D.</b> | The University of Texas at Austin, Mechanical Engineering<br><i>Advisor: Prof. Junmin Wang</i><br><i>Thesis: Synergistic and Intelligent Control of Vehicle Powertrain-Aftertreatment Systems</i> | 2019 |
| <b>M.S.</b>  | North Carolina State University, Electrical Engineering   | 2013 |
| <b>B.S.</b>  | Harbin Institute of Technology, Control Science and Engineering   | 2012 |

## EXPERIENCE

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| <b>Texas Tech University, Lubbock</b><br><b>Assistant Professor</b> , Department of Mechanical Engineering <ul style="list-style-type: none"><li>Instructor, ME 4334-003 Control of Dynamic System</li><li>Director, Mobility Automation Lab</li></ul>  | 2019 to Present |
| <b>The University of Texas at Austin, Austin</b><br><b>Graduate Research Assistant</b> , Mobility System Lab <ul style="list-style-type: none"><li>Evaluation and control design of Connected Autonomous Vehicle for energy efficiency and mobility improvement of the transportation system</li><li>Optimization of vehicle energy and emission performance with autonomy, connectivity and driver characteristics</li></ul> | 2018 to 2019    |
| <b>The Ohio State University, Columbus</b><br><b>Graduate Research Associate</b> , Vehicle System and Control Lab <ul style="list-style-type: none"><li>Modeling, control, and estimation of automotive engine, powertrain, and aftertreatment system</li><li>Optimization and control of hybrid vehicle power management systems</li></ul>   | 2014 to 2018    |
| <b>Mohu Consumer Electronics, Raleigh</b><br><b>Electrical Engineer</b> , Product Development <ul style="list-style-type: none"><li>Board-Level analog circuit design, prototype, and manufacture</li></ul>   | 2013 to 2014    |

## SELECTED PROJECTS

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| <b>Texas Tech University, Mobility Automation</b> <ul style="list-style-type: none"><li>Connected and Autonomous Vehicle in Mixed Traffic</li><li>Driver Behavior Monitoring, Characterization, and Analysis</li><li>Predictive Propulsion and Energy Systems Control for Connected Vehicles</li></ul>  | 2019 to Present |
| <b>National Science Foundation, Cyber-Physical System: Synergy</b> <ul style="list-style-type: none"><li>Next-generation, personalized, active vehicle safety control systems design with vehicle connectivity technologies</li><li>Interactive driving simulation platform design and implementation with virtual reality and autonomous steering wheel control</li><li>Software user interface and environment design</li></ul> | 2016 to 2018    |

- 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

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

### ***Journal Publications***

[J9] *Mehmet Fatih Ozkan* and Yao Ma, “Eco-Driving and Impacts on Neighboring Vehicles with Driver Behavioral Heterogeneity,” ASME Transactions Journal of Dynamic Systems, Measurement and Control, 2020. (Under Review)

[J8] *Mehmet Fatih Ozkan* and Yao Ma, “Eco-Driving of Connected and Automated Vehicle with Preceding Driver Behavior Prediction,” ASME Transactions Journal of Dynamic Systems, Measurement and Control, 2020. (In Press)

[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, “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<sub>x</sub> 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***

[C11] Yao Ma, Donald J. Docimo, and Victor Maldonado, “Preliminary Design and Dynamics of a Semi-Expendable Unmanned Ground-Aerial Vehicle”, Proceedings of the 2021 AIAA AVIATION Forum, 2021. (Under Review)

[C10] *Mehmet Fatih Ozkan* and Yao Ma, “Personalized Adaptive Cruise Control and Impacts on Mixed Traffic,” Proceedings of the 2021 American Control Conference, 2021. (Accepted)

[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] Pinggen Chen and Yao Ma, “Model Predictive NO<sub>x</sub> 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**

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[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

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<b>Texas Tech University</b> , Lubbock	2019 to Present
<b>Instructor</b> , Department of Mechanical Engineering	
<ul style="list-style-type: none"> <li>ME 4334 Control of Dynamic Systems, Evaluations: Fall 2019: 4.6/5; Spring 2020: 4.6/5; Fall 2020: 4.1 (Online)</li> <li>ME 4331 Individual Study in Mechanical Engineering: Scaled Autonomous Vehicle Design and Control</li> <li>ME 5120 Graduate Seminar</li> </ul>	
<b>Thesis Advisor</b> , Department of Mechanical Engineering	
<ul style="list-style-type: none"> <li>One Ph.D. Student, Aug 2023 (Expected)</li> <li>One M.S. Student, Aug 2021 (Expected)</li> </ul>	
<b>The University of Texas at Austin</b> , Austin	2019
<b>Teaching Assistant</b> , Walker Department of Mechanical Engineering	
<ul style="list-style-type: none"> <li>Course ME 340 Mechatronics</li> </ul>	
<b>The Ohio State University</b> , Columbus	2017
<b>Guest Lecturer</b> , Department of Mechanical and Aerospace Engineering	
<ul style="list-style-type: none"> <li>Course ME 3260 System Dynamics and Vibrations</li> </ul>	
<b>North Carolina State University</b> , Raleigh	2013
<b>Teaching Assistant</b> , Department of Electrical Engineering	
<ul style="list-style-type: none"> <li>Course Robotics featuring Scaled Autonomous Vehicle</li> <li>Supervise lab experiment</li> </ul>	

## SERVICE

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### 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 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)

#### **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:**

- Panel Reviewer, 2021 National Science Foundation

#### **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**

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<b>Texas Tech University</b> Nominee, 2020 ORAU Ralph E. Powe Junior Faculty Enhancement Awards	2019
<b>The University of Texas at Austin</b> Recipient, Advance Teaching Certificate by Faculty Innovation Center	2018
<b>American Control Conference Committee</b> Recipient, Student Travel Award	2016, 2018
<b>Harbin Institute of Technology</b> Recipient, People's Scholarship	2008-2010

### **STUDENTS AWARDS**

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**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