

## QADEER AHMED

Research Scientist  
Center for Automotive Research,  
The Ohio State University,  
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### RESEARCH INTEREST

Smart Powertrain and Automotive systems; Optimal Control; Fault Diagnosis; Structural analysis-based Fault Diagnosis; Sliding Mode Control; Nonlinear Control; Cybersecurity; Machine learning;

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### POSITIONS HELD:

<b>Research Scientist</b> Center for Automotive Research, The Ohio State University, Columbus	<b>2016- Present</b>
<b>Senior Research Associate</b> Center for Automotive Research, The Ohio State University, Columbus	<b>2015 – 2016</b>
<b>Research Associate and Post-Doctoral Researcher</b> Center for Automotive Research, The Ohio State University, Columbus	<b>2012 – 2014</b>
<b>Research Engineer &amp; Research Assistant</b> Control & Signal Processing Research Group, M. A. Jinnah Univ., Islamabad, PK	<b>2007 – 2011</b>

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### EDUCATION

<b>Doctor of Philosophy [With Distinction] in Electronic Engineering</b> (Major: Control Systems) Muhammad Ali Jinnah University, Islamabad, Pakistan. Thesis Title: Fault Diagnosis Methodologies for Automotive Engine Air Intake Path Advisor: Prof. Aamer I. Bhatti.	<b>October 2011</b>
<b>Master of Science [With Distinction] in Electronic Engineering</b> (Major: Control Systems) Muhammad Ali Jinnah University, Islamabad, Pakistan. Thesis Title: Robust Control Algorithms for Twin Rotor System Advisor: Prof. Aamer I. Bhatti.	<b>June 2009</b>
<b>Bachelor of Science [With Hons] in Mechatronics &amp; Control Engineering</b> University of Engineering & Technology, Lahore, Pakistan.	<b>December 2006</b>

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### PUBLICATIONS:

20 Journal articles; 57 Conference proceedings and 1 Monograph (See the attached document for list)  
Scopus: Citations 327 and H-Index:10  
Google Scholar: Citations 428 and H-Index:11  
ISI Web of Science: Citations: 162 and H-Index:8

## TEACHING EXPERIENCE

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- Teaching ME2040 Statics and Mechanics of Materials in Spring 2019 to a class of 94 undergraduate students.
- Taught ME2040 Statics and Mechanics of Materials in Autumn 2018 to a class of 145 undergraduate students.
- Taught ECE3551 Introduction to Feedback Control Systems in Spring 2018 to a class of 49 undergraduate students.
- 3 Lectures in ME8372, Fault Diagnosis in Dynamic Systems, taught by Prof. Giorgio Rizzoni in 2017
- 1 lecture in ECE 3551 Introduction to Feedback Control Systems, taught by Prof. Vadim Utkin in 2017
- Assisted Prof. Giorgio Rizzoni in preparing lecture presentations, exams and assignments for ME 8372 Fault diagnostics of dynamical systems in 2014
- Developed MATLAB/Simulink based simulator platform as part of course work on Modeling and Control of HEV for Stuttgart International Summer School on Mobility in 2013.
- Designed, Developed & Conducted Control Engineering Lab Course in M. A. Jinnah University in 2009

## SCHOLARSHIP AND AWARDS

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- **Lumley Research Award** by OSU College of Engineering, 2018
- Best Young Scientist 2012 declared by Pakistan Science Foundation and National Academy of Young Scientist.
- M. A. Jinnah University, Islamabad Postgraduate scholarship (2009-2011).
- M. A. Jinnah University, Islamabad, Deans Role of Honor, 2009.
- Selected for Young Author support program, IFAC, World Congress, 2008, Seoul, Korea.
- Selected for Student support award, Conference of Control Application, 2009 St. Petersburg, Russia.
- Talent Scholarship at University of Engineering & Technology Lahore, 2003.
- 3rd Position (among 6000 candidates approx.) in Matriculation Board Exam, 2000.

## GRANTS AND SPONSORED PROGRAMS:

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### Project Leadership Role:

1. Cummins Inc: Spatial constrained Powertrain Control of PHEV for EV Geo-fencing and Cybersecurity Issues in advance vehicle controllers 2018-19  
OSU PI: **Qadeer Ahmed**, OSU co-PI: Giorgio Rizzoni ~\$0.5M
2. OSU CAR Industrial Consortium project- Model-based functional safety analysis of highly automated driving 2018-19  
OSU PI: **Qadeer Ahmed** \$50,000
3. Ford Motor Company- Model-based Fault Diagnosis of Automatic Transmission Systems using Structural Analysis 2017-18  
OSU PI: **Qadeer Ahmed**, OSU co-PI: Giorgio Rizzoni \$190,000
4. US DOE- U.S.-China Clean Energy Research Center (CERC) Truck Research Utilizing Collaborative Knowledge (TRUCK); 2016-21  
Project Partners: ANL, Cummins Inc., FCCC, OSU, ORNL, Purdue Uni., and Uni. of Michigan; \$25M  
OSU PIs: Giorgio Rizzoni, Marcello Canova and **Qadeer Ahmed**

5. Parker Hannifin Inc.- Fault Diagnosis and Cost Optimization of Parker Fluid Systems using “Connected” Sensors; OSU PI: Giorgio Rizzoni, OSU co-PI: Greg Busch and **Qadeer Ahmed.** 2016-18  
~\$0.5M
6. US DOE- Electric Truck with Range Extending Engine (ETREE); Project Partners: Cummins Inc., PACCAR Inc., OSU, ANL and NREL; OSU PI: Giorgio Rizzoni, OSU co-PI: **Qadeer Ahmed** 2016-19  
\$4.5M
7. Ford Motor Company- Model-based Functional Safety Analysis of the HEV MHT Torque Monitor Subsystem; OSU PI: Giorgio Rizzoni, OSU co-PI: **Qadeer Ahmed** 2016-17  
\$180,000
8. Cummins Inc.- Optimal look-ahead energy management scheme for an on-highway HEV; OSU PI: Giorgio Rizzoni, OSU co-PI: **Qadeer Ahmed.** 2016-17  
\$450,000
9. Ford Motor Company- Applying Structured Analysis to 10R Transmission; OSU PI: Giorgio Rizzoni, OSU co-PI: **Qadeer Ahmed** 2015-16  
\$49,000

**Project Manager/Team Member:**

1. Ford Motor Company: AV Test Driver - Active Diagnosis for Mechanical Faults OSU Team: Giorgio Rizzoni (PI), **Qadeer Ahmed** 2018-19  
\$180,000
2. Parker Hannifin Inc.- Modeling optimization and health monitoring of a Parker TransAir system; OSU Team: Giorgio Rizzoni (PI), Greg Busch (co-PI), **Qadeer Ahmed** 2015-16  
\$245,000
3. Cummins Inc.- Model and algorithm development for control and optimizations of energy management in HEVs in Modelica Programming Language OSU Team: Giorgio Rizzoni (PI), **Qadeer Ahmed** 2015-16  
\$65,000
4. Cummins Inc.- Model and algorithm development for control and optimization of energy management in HEVs OSU Team: Giorgio Rizzoni (PI), **Qadeer Ahmed** 2014-15  
\$450,000
5. U.S.-China Clean Energy Research Center (CERC) (Thrust area: Vehicle Electrification) Consortium OSU Team: Giorgio Rizzoni (PI), **Qadeer Ahmed** (2012-14) 2012-16
6. NSF GOALI: Aging propagation and model based prognosis for inter-connected systems OSU Team: Giorgio Rizzoni (PI), Wei Zhang (co-PI), **Qadeer Ahmed** 2013-16  
\$250,000
7. Sandia Labs- Conceptual design development of an advanced semi-trailer dual redundant hybrid electrical power system. OSU Team: Yann Guezennec (PI), **Qadeer Ahmed** 2012  
\$25,000
8. ICT R&D Fund Pakistan- Early Fault Warning in Automotive Systems Project Team: Aamer Iqbal Bhatti (PI), **Qadeer Ahmed** 2009-2011  
PKR 15.4M
9. Obstacle Avoiding Robot Control 2009
10. Stewart Platform modeling and control 2008
11. Stabilized platform modeling and control 2007

### Grant Proposal Preparation and Submission

Actively participated in successful 10+ grants proposal preparation submitted to: US Department of Energy, National Science Foundation, USAID, Automotive OEMs and Tier 1 suppliers.

### PRESENTATIONS AND SEMINARS

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1. "Challenges in Modern Automotive systems" seminar at OSU Marion Campus on Nov 28<sup>th</sup> 2018.
2. "Diagnostics in Advanced Automatic Transmissions" seminar at Center for Automotive Research OSU, April 17, 2018.
3. "Automotive Engineers are cool" talk with 2<sup>nd</sup> graders at Alpine Elementary School, April 5, 2018.
4. "Is Engineering An exciting career?" seminar for 8<sup>th</sup> graders at Sunrise academy Dec 15, 2017.
5. "Advance diagnostics in Modern Automatic transmission" part of workshop on "Fault Diagnosis in Complex Systems Using Structural Analysis, and Application to Automotive Functional Safety" at 1st IEEE Conference on Control Technology and Applications, Hawaii, US, 2017.
6. "Modeling and Control of Dual Mechanical Port based Hybrid Electric Vehicle Powertrain" presentation at CERC annual conference at University of Michigan, August 2014.
7. "Modeling and Control of Hybrid Electric Vehicle Powertrain", Presentation at Symposium on Recent Advances in Control Engineering held by IEEE CSS Pakistan chapter. 23rd April 2014
8. "Structural analysis based FDI for dynamical system" seminar on 29th April 2014 at IEEE CSS Pakistan chapter group meeting held at Muhammad Ali Jinnah University, Islamabad, Pakistan.
9. "Sustainable mobility and The Future of Transportation", seminar at Pakistan Institute of engineering & Applied Sciences and Capital University Science and Technology Islamabad, Pakistan, September 2012.

### PROFESSIONAL SOCIETIES

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1. Member IEEE and IEEE Control System Society (CSS)
2. Member American Society of Mechanical Engineer (ASME)
3. Member Society of Automotive Engineer (SAE)
4. Member of ASME DSCD Technical Committee (TC) on Automotive and Transport Systems (ATS).
5. Member of International Federation of Automatic Control (IFAC) TC on Automotive Control.
6. Member of IEEE CSS technical committee on Automotive Control.
7. Member of IEEE CSS committee on Control Standards (Automotive Control)

### UNDERGRADUATE, GRADUATE STUDENT AND VISITING SCHOLAR SUPERVISION

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PhD Graduate Students	Student Institution	Year
Bharat Hedge (Advisor G. Rizzoni):	The Ohio State University	2014-18
Brian Rehman (Advisor G. Rizzoni).	The Ohio State University	2015-
Mukilan Arasu (Advisor G. Rizzoni):	The Ohio State University	2015-
Kaveh K. Sadabadi (Advisor G. Rizzoni)	The Ohio State University	2016-
Tianpei Li (Advisor G. Rizzoni)	The Ohio State University	2016-
Ahmed Yar (Advisor: A. I. Bhatti)	Capital Uni. Of Sci. & Tech	2014-17
Athar Hanif (Advisor: A. I. Bhatti)	Capital Uni. Of Sci. & Tech	2014-
Ghulam Murtaza (Advisor: A. I. Bhatti)	Capital Uni. Of Sci. & Tech	2014-17
Raheel Anjum (Advisor: A. I. Bhatti)	Capital Uni. Of Sci. & Tech	2015-
M. Asghar (Advisor: A. I. Bhatti)	Capital Uni. Of Sci. & Tech	2014-

Pradeep Oruganti (Advisor G. Rizzoni)	The Ohio State University	2017-
Hamza Anwar (Advisor G. Rizzoni)	The Ohio State University	2018-
Tong Zhao (Advisor G. Rizzoni)	The Ohio State University	2017-

**Master Graduate Students**

Chris Stanislovaitis (Advisor G. Rizzoni)	The Ohio State University	2014-15
Avinash Divecha (Advisor G. Rizzoni)	The Ohio State University	2015-16
Avi. V. Rajendra (Advisor G. Rizzoni)	The Ohio State University	2016-17
Xuchen Li (Advisor G. Rizzoni)	The Ohio State University	2017-18
Matt Appel (Advisor G. Rizzoni)	The Ohio State University	2018-19

**Undergraduate Students:**

Chris Stanislovaitis (Advisor G. Rizzoni)	The Ohio State University	2013
Xianpai Zeng (Advisor G. Rizzoni)	The Ohio State University	2013
Rongcong Xu (Advisor G. Rizzoni)	Harbin Institute of Tech	2014
Xieyuan Zhang (Advisor G. Rizzoni)	Beijing Ins. Of Tech	2017
Anthony Jackson	The Ohio State University	2017

**Postdocs**

Daniel Jung	The Ohio State University	2017-18
Athar Hanif	The Ohio State University	2018-

**Visiting Scholars**

Dr. Qi Chen	Hefei University of Technology, China	2014-15
Dr. Xuemin Li	Harbin Institute of Technology, China	2015
Dr. Changquig Du	Wuhan University, China	2016
Michele Barbieri	University of Rome Tor Vergata, Italy	2013
Zhengtong Liu	Beijing Ins. Of Tech	2014-15
Rongcong Xu	Beijing Ins. Of Tech.	2014
Minghui Zhang	Xi'an university of technology, China	2014
Chunyan Guo	Xi'an university of technology, China	2015
Dr. Hu Jei	Wuhan University, China	2017
Mingjie Zhao	Beijing Ins. Of Tech	2018

**PROFESSIONAL SERVICES**

**Conference organization**

Member of ASME DSCC 2015 conference management team

**Special Sessions:**

ACC 2018- "Challenges in Advanced diagnostics of complex industrial systems"

**Invited Sessions:**

ASME DSCC 2016- 'Modeling and Control of Internal Combustion Engines'.

ASME DSCC 2017- 'Modeling and Estimation for Vehicle Safety and Integrity'.

AMSE DSCC 2018- 'Modeling and Control of IC Engines and Powertrain Systems'

ACC 2016- 'Energy Storage and Hybrid Electric Vehicle Controls' and 'Advanced Ground Vehicle Estimation and Control Algorithms'.

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ACC 2017- 'Electrochemical Modeling and Diagnostics of Li-ion Batteries'

ACC 2018- 'Control of Engine Breathing; Advances in Control of the Air-Path for Internal Combustion Engines' and 'Energy/Fuel Efficient Powertrains'.

CCTA 2017- 'Vehicle Dynamics Modeling and Control', 'Modeling, Control and Optimization of Powertrain Systems' and 'Connected and Autonomous Vehicles'.

CCTA 2018- 'Control and Diagnostics of Powertrains and Vehicle Dynamics'

**Editorial Board Member**

Associate Editor for American Control Conference 2016, 2017, 2018.

Associate Editor for ASME Dynamic Systems and Control Conference (DSCC), 2015, 2016, 2017.

Associate Editor for IFAC Advances in Automotive Control 2016.

Associate Editor for IFAC Workshop on Engine and Powertrain Control, Simulation and Modeling (ECOSM), 2015, 2018.

Associate Editor for Chinese Control Conference 2018.

Associate Editor for IEEE Conference on Control Technology and Applications, 2018.

International Program Committee Member for IFAC E-CoSM 2018

Technical Committee Member for ICCEREC 2017, ICET 2017, International Congress on Ultra-Modern Control Systems 2010, 2011. International Congress on Ultra-Modern Control Systems 2010, 2011.

**Reviewer Services**

- **Book Publishers:** Elsevier, Springer, Wiley Publishers, iConcept Press

- **Journals:** IEEE T. on Cntrl Sys. Tech.; Automatica; IEEE T. on Ind. Elec.; Int. J. of Heavy Veh. Sys.; SAE Int. J. of Commercial Vehicles; Cntrl Engg. Practice; J. of Process Cntrl, IEEE T. on Mechatronics; Int. J. of Adaptive Control and Signal Processing; IEEE Control Systems Letters; IEEE Access;

- **Conference:** ASME DSCC, IFAC ECOSM, ACC, IFAC AAC, IFAC Safeprocess, SAE World Congress, IFAC World Congress, ECC,

- **Proposals:** ARO, ORNL, US DOE Small business ventures, Ontario Research Fund, OSU Big Data Funding,

- **Miscellaneous:** Super build by Smithsonian Institute, Undergraduate project judge at OSU college of engineering 2015

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