

Syed Ali Asad Rizvi

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Tennessee Technological University
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Education

University of Virginia Ph.D. in Electrical Engineering	Charlottesville, Virginia Aug. 2015{ Dec. 2019
National University of Sciences and Technology M.S. in Electrical Engineering, summa cum laude	Karachi, Pakistan Sep. 2012{ Jul. 2014
NED University of Engineering and Technology B.E. in Industrial Electronics Engineering, summa cum laude	Karachi, Pakistan Jan. 2008{ Dec. 2011

Professional Experience

Tennessee Technological University Assistant Professor, Department of Electrical and Computer Engineering	Cookeville, Tennessee Aug. 2021{ Present
National Institute of Standards and Technology (NIST) Postdoctoral Fellow, Energy and Environment Division	Gaithersburg, Maryland Feb. 2020{ Jul. 2021
Data Communication and Control (Pvt.) Ltd. Design and Research Engineer	Karachi, Pakistan Feb. 2012{ Jul. 2015

Research Areas

Control theory, reinforcement learning, and optimization with applications in autonomous vehicles, energy systems, rotordynamics with magnetic bearings, HVAC systems, and electric drives.

Sponsored Research

- ^ Principal Investigator (Subaward with Zongli Lin), "Design Optimization and Validation of a Machine-Learning-Based Integrated JB/AMB Supported Rotor for Energy Applications," National Academy of Sciences (NAS), Amount: \$200,000 (50% share) 2023-2025
- ^ Principal Investigator, "A Game-Theoretic Reinforcement Learning Control Framework for Multi-Agent Control of Building HVAC Systems," National Institute of Standards and Technology (NIST), Amount: \$120,000 (100% share) 2022-2024
- ^ Principal Investigator, "A Stabilizing Reinforcement Learning Control Framework for Handling Real-World Constraints," Office of Research at Tennessee Technological University, Amount: \$5,000 (100% share) 2022-2023
- ^ Senior Personnel (PI: Syed Hasan, co-PIs: Nan Guo, Doug Talbert), "Cybersecurity for Autonomous Ground Vehicles: Towards Hardware in the Loop Simulation for Autonomous Vehicles' Cybersecurity," Applied Research Associates (ARA), Amount: \$1,812,925 (6% share) 2023-2025
- ^ Senior Personnel (PI: Pinggen Chen, co-PIs: Joseph Ojo, Nan Chen), "Second-Life Battery in Mobile EV Charging Application for Rural Transportation (SMART)," U.S. Department of Energy (DOE), Amount: \$4,202,542 (5% share) 2023-2025

Publications

Books

1. S. A. A. Rizvi and Z. Lin, Output Feedback Reinforcement Learning Control for Linear Systems, 2022. Birkhäuser, Springer.

Book Chapters

1. S. A. A. Rizvi, Y. Wei and Z. Lin, "Reinforcement learning for optimal adaptive control of time delay systems," in Handbook of Reinforcement Learning and Control, pp. 215-242, 2021. Springer.

Journals

1. S. A. A. Rizvi, A. Pertzborn and Z. Lin, "Development of a bias compensating Q-learning controller for a multi-zone HVAC facility," IEEE CAA Journal of Automatica Sinica, vol. 10, no. 8, pp. 1704-1715, 2023. IEEE.
2. D. Zhang, J. Anwar, S. A. A. Rizvi and Yusheng Wei, "Deep learning for continuous-time leader synchronization in graphical games using sampling and deep neural networks," ASME Letters in Dynamic Systems and Control, vol. 3, no. 3, pp. 031004(1-6), 2023. ASME.
3. S. A. A. Rizvi and Z. Lin, "A note on state parameterizations in output feedback reinforcement learning control of linear systems," IEEE Transactions on Automatic Control, vol. 68, no. 10, pp.

13. S. A. A. Rizvi and Z. Lin, "Output feedback Q-learning for discrete-time linear zero-sum games with application to the H-infinity control," *Automatica*, vol. 95, pp. 213-221, 2018. Elsevier.
14. S. A. A. Rizvi and A. Y. Memon, "An extended observer-based robust nonlinear speed sensorless controller for a PMSM," *International Journal of Control*, vol. 92, no. 9, pp. 2123-2135, 2018. Taylor & Francis.
15. B. Weaver, T. Tsukuda, S. A. A. Rizvi, et al., "Experimental measurements of turbomachinery rotordynamics, component performance, and dynamic control at ROMAC—a review," *Journal of the Gas Turbine Society of Japan*, vol. 45, no. 4, pp. 235-242, 2017.

Conferences

1. M. H. Zaheer, S. Y. Yoon and S. A. A. Rizvi, "Derivative feedback control using reinforcement learning," 62nd IEEE Conference on Decision and Control (CDC), 2023, Marina Bay Sands, Singapore. IEEE.
2. U. A. Mughal, M. Ismail and S. A. A. Rizvi, "Stealthy false data injection attack on unmanned aerial vehicles with partial knowledge," 2023 IEEE Conference on Communications and Network Security (CNS), 2023, Orlando, USA. IEEE.
3. J. Anwar and S. A. A. Rizvi, "Bias compensating reinforcement learning control with feedforward adaptation for HVAC systems," 41st American Control Conference (ACC), 2023, San Diego, USA. IEEE.
4. S. A. A. Rizvi and Z. Lin, "Compensation of disturbance induced estimation bias in adaptive dynamic programming based optimal control," SIAM Conference on Control and Its Applications, 2023, Philadelphia, USA. SIAM.
5. D. Zhang, J. Anwar, S. A. A. Rizvi

13. S. A. A. Rizvi and Z. Lin, "Output feedback reinforcement learning control for the continuous-time linear quadratic regulator problem," 36th American Control Conference (ACC), 2018, Milwaukee, USA. IEEE.
14. S. A. A. Rizvi and Z. Lin, "Output feedback optimal tracking control using reinforcement Q-learning," 36th American Control Conference (ACC), 2018, Milwaukee, USA. IEEE.
15. S. A. A. Rizvi and Z. Lin, "Output feedback reinforcement Q-learning control for the discrete-time linear quadratic regulator problem," 56th IEEE Conference on Decision and Control (CDC), 2017, Melbourne, Australia. IEEE.
16. A. Y. Memon and S. A. A. Rizvi, "Robust output feedback linearizing speed sensorless control of PMSM," Multi-Conference on Systems and Control (MSC) and Conference on Control Applications (CCA), 2015, Sydney, Australia. IEEE.
17. S. A. A. Rizvi, M. Faisal, H. Aftab, S. Ahmed and A. Y. Memon, "A robust observer and controller design for a DC motor with a low-resolution encoder," 27th IEEE Chinese Control and Decision Conference 2015, Qingdao, China. IEEE.
18. S. A. A. Rizvi and A. Y. Memon, "Robust output feedback control of PMSM using cascaded sliding mode and high gain observers," 40th Annual Conference of the IEEE Industrial Electronics Society, 2014, Dallas, USA. IEEE.
19. S. A. A. Rizvi and M. B. Kadri, "Online adaptation of rotor parameters using fuzzy logic in indirect field oriented vector control of AC induction drives," 9th IEEE International Conference on Emerging Technologies (ICET), 2013, Islamabad, Pakistan. IEEE.
20. S. A. A. Rizvi and M. B. Kadri, "Sensorless temperature estimation for thermal protection of vector controlled AC drives using fuzzy MRAS," International Conference on Modeling & Simulation (ICOMS), 2013, Islamabad, Pakistan.
21. S. A. A. Rizvi, S. Sunder, F. Haroon and A. Mirza, "Humidity control with interactive web monitoring: a cost-optimal solution for printing industries," 10th IEEE International Conference on Frontiers of Information Technology (FIT), 2013, Islamabad, Pakistan. IEEE.
22. S. A. A. Rizvi, S. Sunder, F. Haroon and A. Mirza, "Virtual instrumentation for control applications," Emerging Trends and Applications in Information Communication Technologies: International Multi-Topic Conference, 2012, Jamshoro, Pakistan. Springer.

Honors & Awards

^ TTU Wings Up 100 Award	, Tennessee Technological University	2023
^ TTU Scholastic Research Award	, Tennessee Technological University	2023
^ PREP Fellowship Award	, National Institute of Standards and Technology	2019
^ Louis T. Rader Graduate Research Award	, University of Virginia	2019
^ Student Travel Award	, American Control Conference	2018
^ Russel Graduate Fellowship Award	, University of Virginia	2017
^ Student Travel Award	, IEEE Conference on Decision and Control	2017
^ ECE Annual Poster Session Award	, 3 rd place, University of Virginia	2017
^ NICTA Research Project Award	, National ICT Australia	2015
^ Travel Scholarship	, IEEE Industrial Electronics Society	2014

- ^ President's Gold Medal , National University of Sciences and Technology 2014
- ^ B.E. Gold Medal , NED University of Engineering and Technology 2012
- ^ Full Tuition Scholarship , Institute of Industrial Electronics Engineering 2008 { 2012
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Professional Service

- ^ Member, IEEE Control Systems Society (CSS) Conference Editorial Board 2023{ Present
- ^ Associate Editor, 63rd IEEE Conference on Decision and Control (CDC) 2024
- ^ Session Organizer, 6th International Conference on Industrial Artificial Intelligence (IAI) 2024
- ^ Associate Editor, 42nd American Control Conference 2023
- ^ Session Chair, 2023 SIAM Conference on Control and its Applications 2023
- ^ Program Committee, 17th International Conference on Control and Automation 2022
- ^ Session Co-Chair, 36th American Control Conference 2018
- ^ Presented short courses annually on "Rotordynamics and Magnetic Bearings" for industry members of Rotating Machinery and Controls (ROMAC) Lab, University of Virginia 2017{ 2019
- ^ Reviewer of over 120 submissions in premier journals and conferences including IEEE Transactions on Automatic Control, Automatica, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Cybernetics, IEEE Conference on Decision and Control (CDC), American Control Conference (ACC), IFAC World Congress, etc.

University Service

- ^ Member (Present Chair) of ECE Scholarships and Student Awards Committee 2021{ Present
- ^ Member of ECE Graduate Program Committee 2021{ Present
- ^ Member of CoE Spectrum Awards Committee 2024
- ^ Faculty Judge in TTU's Research and Creative Inquiry Day 2023
- ^ Member of ECE Robotics, Automation, and Controls Focus Group 2021{ Present
- ^ ECE Faculty Representative in TTU's Student Recruitment Events 2021 { Present

Professional Trainings

- ^ Tomorrow's Professor Today , University of Virginia 2020
- ^ FPGA Based Digital System Design using Verilog HDL , IEEE 2010
- ^ Xpedient Certified Embedded Systems Engineer , Xpedient Technologies 2010

Societies & Affiliations

- ^ Member, IEEE 2012{ Present
- ^ Member, IEEE Control Systems Society 2012{ Present
- ^ Registered Engineer, Pakistan Engineering Council 2014{ Present