Sai Tej PARUCHURI

Curriculum Vitae

Mechanical Engineering & Mechanics
Lehigh University, Bethlehem, USA
✉ *saitejp@lehigh.edu*
Website
in *Linkedin*

Education

2015–2020 **Ph.D. in Mechanical Engineering**, *Virginia Tech*, Blacksburg, VA, USA.
Dissertation title: *Topics on Modeling and Estimation of Linear and Nonlinear Piezoelectric Systems.*
Advisor: *Dr. Andrew Kurdila.*
Research Focus: *Dynamics and Controls; Smart Materials and Adaptive Structures; Data-driven Modeling of Smart Material Systems; Estimation & Control; Nonlinear Systems.*

2019–2020 **M.S. in Mathematics**, *Virginia Tech*, Blacksburg, VA, USA.
Thesis title: *Output Regulation of Systems Governed by Delay Differential Equations: Approximations & Robustness.*
Advisor: *Dr. John Burns.*
Research Focus: *Delay-Differential Equations; Output Regulation; Robust Geometric Control.*

2010–2014 **B.E. in Mechanical Engineering**, *Thiagarajar College of Engineering (TCE)*, Madurai, India.

Academic Appointments

Jan 2023 – Ongoing **Research Scientist**, *Plasma Control Laboratory, Mechanical Engineering & Mechanics*, Lehigh University, Bethlehem, PA, USA.

Nov 2020 – Dec 2022 **Postdoctoral Research Associate**, *Plasma Control Laboratory, Mechanical Engineering & Mechanics*, Lehigh University, Bethlehem, PA, USA.

Research Interests

- Nuclear Fusion & Tokamaks; Scalar & Profile Control of Tokamak Plasmas; Integrated Control & Actuator Management in Tokamaks; Tokamak Scenario Optimization; AI-Driven Fusion Solutions.
- Nonlinear Control; Adaptive Control; Optimal & Robust Control; Adaptive Dynamic Programming; Nonparametric Estimation; RKHS Embedding Methods; Reinforcement Learning.

Publications: Journal Articles

[1] **S. T. Paruchuri**, I. Ward, N. Rist, V. Graber, H. Al Khawaldeh, Z. Wang, E. Schuster, A. Pajares, and J.-W. Juhn, "Density regulation with disruption avoidance in next-generation tokamaks using a safe reinforcement learning-based controller," *Fusion Engineering and Design*, vol. 216, p. 115064, July 2025.

[2] **S. T. Paruchuri**, A. Pajares, and E. Schuster, "Lyapunov-based nonlinear control of nonautonomous systems with individual input constraints," *Automatica*, vol. 173, p. 111998, Mar. 2025.

[3] S. Morosohk, Z. Wang, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Optimal control of the electron temperature profile in DIII-D using machine learning surrogate models," *Fusion Engineering and Design*, vol. 206, p. 114615, 2024.

[4] B. Leard, Z. Wang, **S. T. Paruchuri**, E. Schuster, and T. Rafiq, "Hybrid model predictive control techniques for safety factor profile and stored energy regulation while incorporating NBI constraints," *Nuclear Fusion*, vol. 64, no. 8, p. 086052, 2024.

[5] S. Niu, A. Bouland, H. Wang, F. Fotiadis, A. Kurdila, A. L'Afflitto, **S. T. Paruchuri**, and K. G.

Vamvoudakis, "Convergence Rates of Online Critic Value Function Approximation in Native Spaces," *IEEE Control Systems Letters*, pp. 1–1, 2024.

[6] A. J. Kurdila, **S. T. Paruchuri**, N. Powell, J. Guo, P. Bobade, B. Estes, and H. Wang, "Approximation of discrete and orbital Koopman operators over subsets and manifolds," *Nonlinear Dynamics*, vol. 112, pp. 6291–6327, Apr. 2024.

[7] **S. T. Paruchuri**, A. Pajares, T. Rafiq, and E. Schuster, "Nonlinear control of the minimum safety factor in tokamaks by optimal allocation of spatially moving electron cyclotron current drive," *Fusion Engineering and Design*, vol. 207, p. 114612, Oct. 2024.

[8] X. Song, B. Leard, Z. Wang, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Control-Oriented Free-Boundary Equilibrium Solver for Tokamaks," *Plasma*, vol. 7, no. 4, pp. 842–857, 2024.

[9] **S. T. Paruchuri**, V. Graber, A. Pajares, and E. Schuster, "Static actuator-sharing algorithm for concurrent control of multiple plasma properties," *Plasma Physics and Controlled Fusion*, vol. 67, p. 015005, Nov. 2024.

[10] **S. T. Paruchuri**, V. Graber, H. A. Khawaldeh, and E. Schuster, "Dynamic Actuator Allocation via Reinforcement Learning for Concurrent Plasma Control Objectives," *IEEE Transactions on Plasma Science*, vol. 52, pp. 4140–4146, Sept. 2024.

[11] S. Morosohk, Z. Wang, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Simultaneous control of the electron temperature and safety factor profiles in DIII-D using model-based optimal control techniques," *Plasma Physics and Controlled Fusion*, vol. 67, p. 015012, Dec. 2024.

[12] B. R. Leard, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Fast model-based scenario optimization in NSTX-U enabled by analytic gradient computation," *Fusion Engineering and Design*, vol. 192, p. 113606, 2023.

[13] **S. T. Paruchuri** and E. Schuster, "Nonlinear control of safety factor gradient in tokamaks using spatially variable electron cyclotron current drives," *Fusion Engineering and Design*, vol. 194, p. 113914, 2023.

[14] H. Al Khawaldeh, B. Leard, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Model-based linear–quadratic–integral controller for simultaneous regulation of the current profile and normalized beta in NSTX-U," *Fusion Engineering and Design*, vol. 192, p. 113795, 2023.

[15] **S. T. Paruchuri**, Z. Wang, T. Rafiq, and E. Schuster, "Model predictive current profile control in tokamaks by exploiting spatially moving electron cyclotron current drives," *Fusion Engineering and Design*, vol. 192, p. 113796, 2023.

[16] J. Burns, B. Estes, J. Guo, A. Kurdila, **S. T. Paruchuri**, and N. Powell, "Kernel methods for regression in continuous time over subsets and manifolds," *Nonlinear Dynamics*, vol. 111, no. 14, pp. 13165–13186, 2023.

[17] **S. T. Paruchuri**, J. Guo, and A. Kurdila, "Sufficient Conditions for Parameter Convergence Over Embedded Manifolds Using Kernel Techniques," *IEEE Transactions on Automatic Control*, vol. 68, no. 2, pp. 753–765, 2023.

[18] A. Bouland, S. Niu, **S. T. Paruchuri**, A. Kurdila, J. Burns, and E. Schuster, "Rates of Convergence in a Class of Native Spaces for Reinforcement Learning and Control," *IEEE Control Systems Letters*, pp. 1–1, 2023.

[19] J. Guo, M. E. Kepler, **S. T. Paruchuri**, H. Wang, A. J. Kurdila, and D. J. Stilwell, "Adaptive estimation of external fields in reproducing kernel Hilbert spaces," *International Journal of Adaptive Control and Signal Processing*, vol. 36, no. 8, pp. 1931–1957, 2022.

[20] **S. T. Paruchuri**, J. Guo, and A. Kurdila, "Kernel center adaptation in the reproducing kernel Hilbert space embedding method," *International Journal of Adaptive Control and Signal Processing*, vol. 36, no. 7, pp. 1562–1583, 2022.

[21] **S. T. Paruchuri**, J. Guo, and A. Kurdila, "Reproducing kernel Hilbert space embedding for adaptive estimation of nonlinearities in piezoelectric systems," *Nonlinear Dynamics*, vol. 101, no. 2, pp. 1397–1415, 2020.

[22] **S. T. Paruchuri**, V. V. S. Malladi, P. A. Tarazaga, and A. J. Kurdila, "Expanding the teaching of single frequency vibration absorption to broadband attenuation using subordinate oscillator arrays via fettuccine pasta," *Engineering Structures*, vol. 224, p. 111201, 2020.

[23] J. Sterling, **S. T. Paruchuri**, T. J. Ryan, J. Vignola, and A. J. Kurdila, "Subordinate Oscillator Arrays: Physical Design and Effects of Error," 2020.

[24] J. Guo, S. Dadashi, M. Bender, **S. T. Paruchuri**, N. Powell, Y. Sharma, H. Kurdila, J. W. McGlothlin, and A. J. Kurdila, "Probabilistic error bounds on constraint violation for empirical-analytical Lagrangian models of motion," *Nonlinear Dynamics*, vol. 98, no. 1, pp. 195–213, 2019.

[25] A. J. Kurdila, J. Guo, **S. T. Paruchuri**, and P. Bobade, "Persistence of excitation in reproducing kernel hilbert spaces, positive limit sets, and smooth manifolds," *arXiv preprint arXiv:1909.12274*, 2019.

[26] **S. T. Paruchuri**, J. Sterling, V. V. N. S. Malladi, A. Kurdila, J. Vignola, and P. Tarazaga, "Passive piezoelectric subordinate oscillator arrays," *Smart Materials and Structures*, vol. 28, no. 8, p. 085046, 2019.

[27] J. A. Sterling, J. F. Vignola, T. J. Ryan, and **S. T. Paruchuri**, "Analysis of increased damping in arrays of attached resonators," *The Journal of the Acoustical Society of America*, vol. 145, no. 3, pp. 1824–1824, 2019.

Publications: Peer-Reviewed Conference Proceedings

[1] N. Powell, **S. T. Paruchuri**, A. Bouland, S. Niu, and A. Kurdila, "Invariance and Approximation of Koopman Operators in Native Spaces," in *2024 American Control Conference (ACC)*, pp. 2871–2878, 2024-07-10/2024-07-12.

[2] Z. Wang, **S. T. Paruchuri**, L. Yang, and E. Schuster, "Safety Factor Profile Regulation via Self-Triggered Model Predictive Control in the EAST Tokamak," in *2024 American Control Conference (ACC)*, pp. 2545–2550, 2024-07-10/2024-07-12.

[3] **S. T. Paruchuri**, A. Pajares, and E. Schuster, "Nonlinear Local Control of the Safety-Factor-Profile Gradient at Moving Spatial Locations in Tokamak Plasmas," in *2023 American Control Conference (ACC)*, pp. 1590–1595, 2023.

[4] J. A. Burns, J. Guo, A. J. Kurdila, **S. T. Paruchuri**, and H. Wang, "Error Bounds for Native Space Embedding Observers with Operator-Valued Kernels," in *2023 American Control Conference (ACC)*, pp. 4796–4801, 2023.

[5] **S. T. Paruchuri**, A. Pajares, and E. Schuster, "Lyapunov-based Current-Profile Feedback Control in Tokamaks with Nonsymmetric Individual Actuator Saturation," in *2023 American Control Conference (ACC)*, pp. 1377–1382, 2023.

[6] **S. T. Paruchuri** and E. Schuster, "Distributed Regulation of the Safety Factor Profile in Tokamaks Using Nonlinear Infinite-dimensional Control," in *22nd IFAC World Congress*, vol. 56, pp. 4466–4471, 2023.

[7] **S. T. Paruchuri**, A. Pajares, and E. Schuster, "Minimum Safety Factor Control in Tokamaks via Optimal Allocation of Spatially Moving Electron Cyclotron Current Drive," in *2021 60th IEEE Conference on Decision and Control (CDC)*, pp. 454–459, 2021.

[8] E. Aulisa, J. A. Burns, D. S. Gilliam, and **S. T. Paruchuri**, "Accurate Approximate Regulation of Nonlinear Delay Differential Control Systems," in *2021 60th IEEE Conference on Decision and Control (CDC)*, pp. 422–427, 2021.

[9] J. A. Burns, **S. T. Paruchuri**, and M. Schmidt, "Output Regulation of Systems Governed by Delay Differential Equations: Approximations and Robustness," in *24th International Symposium on Mathematical Theory of Networks and Systems MTNS 2020*, vol. 54, pp. 422–427, 2021.

[10] J. Guo, **S. T. Paruchuri**, and A. J. Kurdila, "Persistence of Excitation in Uniformly Embedded Reproducing Kernel Hilbert (RKH) Spaces," in *2020 American Control Conference (ACC)*, pp. 4539–4544, 2020.

[11] J. Guo, **S. T. Paruchuri**, and A. J. Kurdila, "Approximations of the Reproducing Kernel Hilbert Space (RKHS) Embedding Method over Manifolds," in *2020 59th IEEE Conference on Decision and Control (CDC)*, pp. 1596–1601, 2020.

[12] **S. T. Paruchuri**, J. Guo, M. Kepler, T. Ryan, H. Wang, A. J. Kurdila, and D. Stilwell, "Intrinsic and Extrinsic Approximation of Koopman Operators over Manifolds," in *2020 59th IEEE Conference on Decision and Control (CDC)*, pp. 1608–1613, 2020.

[13] J. Sterling, J. Vignola, J. Gietl, T. Ryan, N. Sonne, and **S. T. Paruchuri**, "Effect of Increased Damping in Subordinate Oscillator Arrays," in *Journal of Physics: Conference Series*, vol. 1149, p. 012006, IOP Publishing, 2018.

[14] **S. T. Paruchuri**, A. Kurdila, and J. Vignola, "Estimation of Distribution Errors in Piezoelectric Subordinate Oscillator Arrays," in *SMASIS2018*, (Volume 1: Development and Characterization of Multifunctional Materials; Modeling, Simulation, and Control of Adaptive Systems; Integrated System Design and Implementation), 2018.

[15] **S. T. Paruchuri**, J. Sterling, A. Kurdila, and J. Vignola, "Piezoelectric composite subordinate oscillator arrays and frequency response shaping for passive vibration attenuation," in *2017 IEEE Conference on Control Technology and Applications (CCTA)*, pp. 702–707, 2017.

[16] **S. T. Paruchuri**, A. J. Kurdila, J. Sterling, A. Vignola, J. Judge, J. Vignola, and T. Ryan, "Thermodynamic Variational Formulations of Subordinate Oscillator Arrays (SOA) With Linear Piezoelectrics," in *IDETC-CIE2017*, (Volume 8: 29th Conference on Mechanical Vibration and Noise), 2017.

Publications: Refereed Conference Abstracts

[1] K. Shabbir, B. Leard, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "A Neural Network Version of the Multi-Mode Model for Fast Simulations in DIII-D," in *Bulletin of the American Physical Society*, (Atlanta, Georgia, USA), APS, 2024.

[2] N. Rist, **S. T. Paruchuri**, and E. Schuster, "Reinforcement Learning-Based Control of the Safety Factor Profile and Normalized Beta in Tokamaks," in *Bulletin of the American Physical Society*, (Atlanta, Georgia, USA), APS, 2024.

[3] H. Al Khawaldeh, **S. T. Paruchuri**, V. Graber, T. Rafiq, E. Schuster, A. Pajares, and J.-w. Juhn, "Advanced Density Regulation for ITER-emulated Scenarios on DIII-D via Adaptive Control Techniques," in *Bulletin of the American Physical Society*, (Atlanta, Georgia, USA), APS, 2024.

[4] I. Ward, V. Graber, N. Rist, **S. T. Paruchuri**, and E. Schuster, "Burn Control in ITER Using a Reinforcement Learning Approach," in *Bulletin of the American Physical Society*, (Atlanta, Georgia, USA), APS, 2024.

[5] H. Al Khawaldeh, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Model-Based Control of the Dimensionless Gain in KSTAR by Leveraging Real-time Estimation of the Confinement Time," in *Bulletin of the American Physical Society*, (Denver, Colorado, USA), APS, 2023.

[6] Z. Wang, **S. T. Paruchuri**, S. Morosohk, and E. Schuster, "Current Profile Control in EAST via Reinforcement-Learning-based Model Predictive Control," in *Bulletin of the American Physical Society*, (Denver, Colorado, USA), APS, 2023.

[7] S. Morosohk, Z. Wang, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Simultaneous Regulation of the Electron Temperature and Safety Factor Profiles for DIII-D using Optimal Control Methods," in *Bulletin of the American Physical Society*, (Denver, Colorado, USA), APS, 2023.

[8] **S. T. Paruchuri** and E. Schuster, "Incorporating Gas Puffing Delays into Density Control Synthesis in Tokamak Reactors By Combining Optimal Control and Reinforcement Learning Techniques," in *Bulletin of the American Physical Society*, (Denver, Colorado, USA), APS, 2023.

[9] B. Leard, Z. Wang, **S. T. Paruchuri**, E. Schuster, and T. Rafiq, "Incorporating Pulse Width Modulation Constraints Arising in Neutral Beam Injection," in *29th IAEA Fusion Energy Conference*, (London, United Kingdom), 2023.

[10] L. Yang, H. Al Khawaldeh, **S. T. Paruchuri**, X. Song, Z. Wang, and E. Schuster, "Towards Density Profile Regulation via Pellet Injection in Tokamaks Using Hybrid Model Predictive Control," in *29th IAEA Fusion Energy Conference*, (London, United Kingdom), 2023.

[11] H. Al Khawaldeh, **S. T. Paruchuri**, Z. Wang, T. Rafiq, and E. Schuster, "Simultaneous Optimal Regulation Of Kinetic+Magnetic Scalar Plasma Properties For Robust Sustainment Of Advanced Scenarios In NSTX-U," in *29th IAEA Fusion Energy Conference*, (London, United Kingdom), 2023.

[12] **S. T. Paruchuri**, V. Graber, A. Pajares, and E. Schuster, "Actuator-Sharing Algorithm For Simultaneous Regulation Of Multiple Plasma Properties With Coupled Dynamics," in *29th IAEA Fusion Energy Conference*, (London, United Kingdom), 2023.

[13] **S. T. Paruchuri** and E. Schuster, "Model-based Safety-Factor-Profile Slope Control at Predefined Rational Surfaces in DIII-D," in *Bulletin of the American Physical Society*, (Spokane, Washington, USA), APS, 2022.

[14] H. Al Khawaldeh, B. Leard, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Model-Based Optimal Control of Core Kinetic+ Magnetic Profiles and Scalar Plasma Properties in NSTX-U," in *Bulletin of the American Physical Society*, (Spokane, Washington, USA), APS, 2022.

[15] H. Wang, J. Burns, J. Guo, A. Kurdila, **S. T. Paruchuri**, and N. Powell, "Koopman Operators and Inverse Problems," in *IEICE Proceedings Series*, vol. 71, The Institute of Electronics, Information and Communication Engineers, 2022.

[16] S. Morosohk, **S. T. Paruchuri**, Z. Wang, T. Rafiq, and E. Schuster, "Robust Control of the Electron Temperature Profile in DIII-D," in *Bulletin of the American Physical Society*, (Spokane, Washington, USA), APS, 2022.

[17] L. Yang, **S. T. Paruchuri**, and E. Schuster, "Electron Density Profile Regulation with Pellet Injection using Self-trigger Model Predictive Control," in *Bulletin of the American Physical Society*, (Spokane, Washington, USA), APS, 2022.

[18] M. Elango, A. Annamalai, and **S. T. Paruchuri**, "Harmonic Analysis on Axial Turbine Blades," in *Recent Advances in Computational and Experimental Mechanics, Vol—I* (D. Maity, P. K. Patra, M. Afzal, R. Ghoshal, C. S. Mistry, P. Jana, and D. K. Maiti, eds.), (Singapore), pp. 23–35, Springer Singapore, 2022.

[19] B. Leard, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Towards In-Between-Discharges Model-Based Scenario Planning in NSTX-U Via Fast Nonlinear Optimization," in *Bulletin of the American Physical Society*, vol. 66, (Pittsburgh, Pennsylvania, USA), APS, 2021.

[20] S. Morosohk, Z. Wang, A. Pajares, **S. T. Paruchuri**, T. Rafiq, and E. Schuster, "Simultaneous Electron Temperature and Safety Factor Profile Control for DIII-D," in *Bulletin of the American Physical Society*, vol. 66, (Pittsburgh, Pennsylvania, USA), APS, 2021.

[21] **S. T. Paruchuri**, A. Pajares, T. Rafiq, and E. Schuster, "Control of the Local Gradient and the Minimum Value of the Safety Factor Profile by Using Moving ECCD," in *Bulletin of the American Physical Society*, vol. 66, (Pittsburgh, Pennsylvania, USA), APS, 2021.

[22] C. R. Neighborgall, K. Kothari, V. V. N. Sriram Malladi, P. Tarazaga, **S. T. Paruchuri**, and A. Kurdila, "Shaping the Frequency Response Function (FRF) of a Multi-Degree-of-Freedom (MDOF) Structure Using Arrays of Tuned Vibration Absorbers (TVA)," in *Topics in Modal*

Analysis & Testing, Volume 8 (M. L. Mains and B. J. Dilworth, eds.), (Cham), pp. 317–326, Springer International Publishing, 2020.

[23] J. Sterling, **S. T. Paruchuri**, P. Tarazaga, J. Vignola, A. Kurdila, V. V. N. S. Malladi, and T. Ryan, "Piezoelectric Subordinate Oscillator Arrays: Performance Recovery and Robustness to Uncertainty," in *IDETC-CIE2019*, (Volume 8: 31st Conference on Mechanical Vibration and Noise), 2019.

[24] J. Vignola, J. Judge, J. Sterling, T. Ryan, A. Kurdila, **S. T. Paruchuri**, and A. Glean, "On the use of shunted piezo actuators for mitigation of distribution errors in resonator arrays," in *Proceedings of the 22nd International Congress on Acoustics, Buenos Aires*, 2016.

Research Experience

Experimental Campaigns at Major International Fusion Research Facilities

Dec 2025 (planned) **Optimal Actuator Allocation for Integrated Control**, *TCV, Swiss Plasma Center*, École Polytechnique Fédérale de Lausanne, Switzerland.

- Working on an actuator allocation framework for integrated plasma control that optimizes the distribution of control authority across multiple actuators.
- Collaborating with the Swiss Plasma Center team and ITER researchers on implementing the framework within the TCV digital plasma control system.
- Designing experiments to validate the efficacy of the proposed allocation algorithm during various plasma control test cases.

April 2025 **Advanced Density Control in DIII-D for ITER and Beyond**, *DIII-D National Fusion Facility*, General Atomics, San Diego, CA, USA.

- Supervised the development of a model reference adaptive plasma density controller that incorporates gas puffing delays.
- Collaborated with researchers at DIII-D, General Atomics, USA and KSTAR, KIFE, Korea.
- Demonstrated the ability to adaptively regulate plasma density in real-time using pellet injection and delayed gas puffing.

Jan 2025 **Advanced Density Regulation for ITER and Future Reactors by Simultaneous Gas Puffing and Pellet Injection**, *KSTAR (Korea Superconducting Tokamak Advanced Research)*, Korea Institute of Fusion Energy, Daejeon, South Korea.

- Assisted in the development and validation of plasma control system (PCS) infrastructure to mimic ITER-like delayed gas puffing.
- Partnered with KIFE specialists in plasma control and pellet injection systems.
- Validated the robustness of the PCS in replicating ITER-like delayed gas puffing conditions.

Teaching, Supervision and Mentoring Experience

Instructor Roles

Spring 2025 **Course Instructor**, *ME 207 Mechanical Engineering Laboratory (Controls Section)*, Lehigh University.

- Taught two back-to-back lab batches combining control theory lectures and hands-on experiments.
- Adapted instruction for students with diverse backgrounds; 65% had no prior coursework in controls.

Spring 2024 **Substitute Instructor**, *ME 450 Nonlinear Systems & Control*, Lehigh University, (Course Instructor: Prof. Eugenio Schuster).

- Delivered four lectures on Lyapunov theorem & feedback linearization.

Research Supervision

2022–Present **Graduate Student Supervisor**, *Lehigh University*, under Prof. E. Schuster.

- Oversaw Ph.D. student research on tokamak scenario optimization, plasma control, and AI-driven fusion solutions, fostering independent investigation and research skills.
- Managed project timelines to ensure milestones were met on schedule and student work aligned with research objectives.
- Advised on article preparation, conference presentations/posters design to support research dissemination.

Teaching Support Roles

Fall 2019 – Spring 2020 **Graduate Teaching Assistant**, *Engineering Education*, Virginia Tech.
- Taught some of the lectures in the freshman introductory course "Foundations of Engineering."
- Assisted the course instructors with creating course exams & assignments.

Fall 2018 – Spring 2019 **Head Graduate Teaching Assistant**, *Mechanical Engineering*, Virginia Tech.
- Supervised other teaching assistants in addition to carrying out duties listed below.

Fall 2017 – Spring 2018 **Graduate Teaching Assistant**, *Mechanical Engineering*, Virginia Tech.
- Assisted course instructor with creating assignments and revising course material and rubrics.
- Created and analyzed peer evaluation data of students required by the Accreditation Board for Engineering and Technology (ABET).
- Guided and evaluated the progress of 9 senior design projects with more than 70 students.

Fall 2016 **Grader**, *System Dynamics, Mechanical Engineering*, Virginia Tech.

Spring 2016 **Grader**, *Differential Equations, Mathematics*, Virginia Tech.

Mentoring Experience

Summer 2017 & 2018 **Academic Coach**, *Student Transition Engineering Program*, Virginia Tech.

Summer, Fall 2018 **Peer Mentor**, *Virginia Tech's Early Engineering Mentoring program*, Virginia Tech.

Industry Work Experience

Sep 2014 - May 2015 **Design Engineer**, *Amritha Tool Crafts Pvt. Ltd.*, India, Full-time employee.

Academic Service

Working Groups, Panels, Workshops

2025 **Review Panelist**, *National Science Foundation (NSF)*, Directorate for Engineering (ENG), Division of Electrical, Communications and Cyber Systems (ENG/ECCS).

Jan 9-11, 2024 **Subject Matter Expert**, *Basic Research Needs Workshop on Measurement Innovation*, Fusion Pilot Plant (FPP)-Magnetic confinement Fusion Energy (MFE) working group.
Sponsored by the U.S. Department of Energy (DOE), Office of Science (SC), Office of Fusion Energy Sciences (FES).

Peer Review

2017 – ongoing **Peer Reviewer for Articles**.
Neurocomputing, Plasma Physics and Controlled Fusion, Neural Networks, Annual Reviews in Control, Nonlinear Dynamics, Fusion Engineering and Design, IEEE Control Systems Letters, International Journal of Robust and Nonlinear Control, International Journal of Adaptive Control and Signal Processing, Journal of the Franklin Institute, IEEE Control Systems Letters, Automatica, IEEE Transactions on Automatic Control, and MPDI Mathematics

2017 – ongoing **Peer Reviewer for Conferences**.
IEEE CDC, IEEE ACC, IEEE CCTA, IFAC SSSC, ASME SMASIS, and IFAC World Congress.

Conference Sessions Organized and Chaired

2017 **Session Co-Chair**, *ASME IDETC 2017*, Cleveland, USA.

2024 **Session Chair**, *IEEE American Control Conference 2024*, Toronto, Canada.

Referees

Available on Request.