Abhinav Sinha

https://sinha-abhinav.github.io/ abhinav.sinha@uc.edu
linkedin.com/in/drabhinavsinha github.com/sinha-abhinav

Work Experience

Dec 2023- Present | **University of Cincinnati**, Cincinnati, USA
Assistant Professor, Department of Aerospace Engineering and Engineering Mechanics

Dec 2021- Nov 2023 | **The University of Texas at San Antonio**, San Antonio, USA
Postdoctoral Fellow, Host : Dr. Yongcan Cao

May 2021- Nov 2021 | **Indian Institute of Technology Bombay**, Mumbai, India
Postdoctoral Fellow, Host : Dr. Shashi Ranjan Kumar

Jan 2019- May 2021 | **Indian Institute of Technology Bombay**, Mumbai, India
Teaching Assistant
- AE 305 : Flight Mechanics– II, Spring 2019, 2020, and 2021
- AE 717 : Aircraft Flight Dynamics, Spring 2019, 2020, and 2021
- AE 410 : Navigation and Guidance, Fall 2019, 2020, and 2021
- AE 641 : Introduction to Navigation and Guidance, Fall 2019, 2020, and 2021

Jun 2019- May 2018 | **Central Scientific Instruments Organisation**, Chandigarh, India
Research Student

Sep 2014- Jul 2016 | **TATA Consultancy Services Limited**, Pune, India
Assistant System Engineer, Consulting in Manufacturing, Automation and Control Systems

Nov 2015 | **TATA Consultancy Services Limited**, Trivandrum, India
Visiting faculty at TCS Global Learning Center

Jun 2011- May 2014 | **Kalinga Institute of Industrial Technology**, Bhubaneswar, India
Instructor and Coordinator, KIIT Robotics Society

Education

Indian Institute of Technology Bombay 2018 - 2021
Doctor of Philosophy (Ph.D.), Aerospace Engineering
Advisor : *Dr. Shashi Ranjan Kumar*

Indian Institute of Engineering Science and Technology 2016 - 2018
Master of Technology (M.Tech.), Mechatronics
Advisor : *Dr. Ritesh Kumar (CSIR-CSIO), Dr. Rishemjit Kaur (CSIR-CSIO)*

Kalinga Institute of Industrial Technology 2010 - 2014
Bachelor of Technology (B.Tech.), Electronics and Instrumentation
Advisor : *Dr. Rajiv Kumar Mishra*

Patents

[P1] Y. Cao, D. Casbeer, P. K. Ranjan, **Abhinav Sinha**, and I. Weintraub, "Relational Maneuvering of Leader-Follower Unmanned Aerial Vehicles for Flexible Formation," U.S. Patent [Pending]

Publications

Refereed Journals– Published/In Press

[J31] U. Siddique, **Abhinav Sinha**, and Y. Cao, "Learning Fair Policies in Multi-Objective Preference-based Reinforcement Learning", Machine Learning Journal (MLJ), 2025.

[J30] **Abhinav Sinha**, D. Mukherjee, and S. R. Kumar, "Consensus-driven Deviated Pursuit for Guaranteed Simultaneous Interception of Moving Targets", *IEEE Transactions on Aerospace and Electronic Systems*, early access, 2025.

[J29] P. Ranjan, **Abhinav Sinha**, and Y. Cao, "3D Guidance Law for Flexible Target Enclosing with Inherent Safety", *IEEE Robotics and Automation Letters*, vol. 10, no. 2, pp. 2088-2095, 2025.

[J28] P. Ranjan, **Abhinav Sinha**, and Y. Cao, "Self-organizing Multiagent Target Enclosing under Limited Information and Safety Guarantees", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 61, no. 1, pp. 1066-1078, 2025.

[J27] P. Ranjan, **Abhinav Sinha**, Y. Cao, D. Casbeer, and I. Weintraub, "Relational Maneuvering of Leader-Follower Unmanned Aerial Vehicles for Flexible Formation", *IEEE Transactions on Cybernetics*, vol. 54, no. 10, pp. 5598-5609, 2024.

[J26] **Abhinav Sinha** and S. R. Kumar, "Time-Critical Unified Rendezvous Guidance for an Unmanned Autonomous Vehicle", *ASME Journal of Autonomous Vehicles and Systems*, vol. 4, no. 3, pp. 031001 1-8, 2024.

[J25] S. Kumar, **Abhinav Sinha**, and S. R. Kumar, "Robust Path-following Guidance for an Autonomous Vehicle in the Presence of Wind", *Aerospace Science and Technology*, vol. 150, pp. 109225, 2024.

[J24] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Three-Dimensional Path Following Nonlinear Guidance for Unmanned Aerial Vehicles", *AIAA Journal of Guidance, Control, and Dynamics*, vol. 47, no. 6, pp. 1231-1240, 2024.

[J23] **Abhinav Sinha** and Y. Cao, "Three-Dimensional Autonomous Guidance for Enclosing a Stationary Target within Arbitrary Smooth Geometrical Shapes", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 59, no. 6, pp. 9247-9256, 2023.

[J22] **Abhinav Sinha** and Y. Cao, "Three-Dimensional Guidance Law for Target Enclosing Within Arbitrary Smooth Shapes", *AIAA Journal of Guidance, Control, and Dynamics*, vol. 46, no. 11, pp. 2224-2234, 2023.

[J21] P. Ranjan, **Abhinav Sinha**, Y. Cao, D. Tran, D. Casbeer, and I. Weintraub, "Energy-efficient Ring Formation Control with Constrained Inputs", *AIAA Journal of Guidance, Control, and Dynamics*, vol. 46, no. 7, pp. 1397-1407, 2023.

[J20] **Abhinav Sinha** and Y. Cao, "3-D Nonlinear Guidance Law for Target Circumnavigation", *IEEE Control System Letters*, vol. 7, pp. 655-660, 2023 (also accepted for presentation at 2023 American Control Conference, San Diego, California, USA).

[J19] **Abhinav Sinha**, R. V. Nanavati, and S. R. Kumar, "Three-dimensional Nonlinear Impact Time Guidance using Predicted Interception Point", *AIAA Journal of Guidance, Control, and Dynamics*, vol. 46, no. 3, pp. 608-617, 2023.

[J18] **Abhinav Sinha**, and Y. Cao, "Nonlinear Guidance Law for Target Enclosing with Arbitrary Smooth Shapes", *AIAA Journal of Guidance, Control, and Dynamics*, vol. 45, no. 11, pp. 2182-2192, 2022.

[J17] **Abhinav Sinha**, and S. R. Kumar, "Cooperative target capture using predefined-time consensus over fixed and switching networks", *Aerospace Science and Technology*, vol. 127, pp. 107686, 2022. [Preprint available at arXiv:2109.01338]

[J16] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Three-agent Time-constrained Cooperative Pursuit-Evasion", Journal of Intelligent & Robotic Systems, vol. 104, no. 28, pp. 1–27, 2022. [Preprint available at arXiv:2106.01895]

[J15] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Cooperative integrated guidance and control design for simultaneous interception", *Aerospace Science and Technology*, vol. 120, pp. 107262, 2022.

[J14] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Impact time constrained integrated guidance and control design", *Aerospace Science and Technology*, vol. 115, pp. 106824, 2021.

[J13] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Nonsingular impact time guidance and control using deviated pursuit", *Aerospace Science and Technology*, vol. 115, pp. 106776, 2021.

[J12] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Cooperative Salvo Based Active Aircraft Defense Using Impact Time Guidance", *IEEE Control Systems Letters*, vol. 5, no. 5, pp. 1573–1578, 2021 (also accepted for presentation at 2021 American Control Conference, New Orleans, Louisiana, USA).

[J11] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Three-Dimensional Nonlinear Cooperative Salvo Using Event-Triggered Strategy", *AIAA Journal of Guidance, Control, and Dynamics*, vol. 44, no. 2, pp. 328–342, 2021.

[J10] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Three-Dimensional Guidance With Terminal Time Constraints for Wide Launch Envelops", *AIAA Journal of Guidance, Control, and Dynamics*, vol. 44, no. 2, pp. 343–359, 2021.

[J9] **Abhinav Sinha**, and S. R. Kumar, "Super-Twisting Control Based Cooperative Salvo Guidance Using Leader-Follower Approach", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 56, no. 5, pp. 3556–3565, 2020.

[J8] **Abhinav Sinha**, and R. K. Mishra, "Consensus in first order nonlinear heterogeneous multi-agent systems with event-based sliding mode control", *International Journal of Control*, vol. 93, no. 4, pp. 858–871, 2020.

[J7] **Abhinav Sinha**, R. Kumar, R. Kaur and R. K. Mishra, "Consensus-Based Odor Source Localization by Multiagent Systems Under Resource Constraints", *IEEE Transactions on Cybernetics*, vol. 50, no. 7, pp. 3254–3263, 2020.

[J6] **Abhinav Sinha**, R. Kumar, R. Kaur and A. P. Bhondekar, "Consensus-Based Odor Source Localization by Multiagent Systems", *IEEE Transactions on Cybernetics*, vol. 49, no. 12, pp. 4450–4459, 2019.

[J5] R. K. Mishra, and **Abhinav Sinha**, "Event-triggered sliding mode based consensus tracking in second order heterogeneous nonlinear multi-agent systems", *European Journal of Control*, vol. 45, pp. 30–44, 2019.

[J4] T. Majumder, R. K. Mishra, **Abhinav Sinha**, S. S. Singh, and P. K. Sahu, "Robust congestion control in cognitive radio network using dynamic event-triggered sliding mode", *International Journal of Communication Systems*, vol. 33, no. 10, pp. e4206, 2019.

[J3] **Abhinav Sinha**, and R. K. Mishra, "Control of a nonlinear continuous stirred tank reactor via event triggered sliding modes", *Chemical Engineering Science*, vol. 187, pp. 52–59, 2018.

[J2] T. Majumder, R. K. Mishra, **Abhinav Sinha**, S. S. Singh, and P. K. Sahu, "Congestion Control in Cognitive Radio Networks with Event-triggered Sliding Mode", *AEU– International Journal of Electronics and Communication*, vol. 90, pp. 155–162, 2018.

[J1] **Abhinav Sinha**, and R. K. Mishra, "Nonlinear autonomous altitude control of miniature helicopter UAV based on sliding mode methodology", *International Journal of Electronics and Communication Technology*, vol. 61, spl.- 1, Jan- Mar 2015.

Refereed Journals– Under Review/Preparation

[j4] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Cooperative Nonlinear Guidance Strategies for Guaranteed Pursuit-Evasion", under review.

[j3] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Provably Safe Control for Constrained Nonlinear Systems with Bounded Input", under review.

[j2] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Trajectory Tracking for Unmanned Aerial Vehicles in 3D Spaces under Motion Constraints", under review.

[j1] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Three-dimensional Nonlinear Path-following Guidance with Bounded Input Constraints", under review.

Book Chapters

[BC2] **Abhinav Sinha**, and R. K. Mishra, "Smooth sliding mode control of a nonlinear CSTR using an inverse hyperbolic function-based law, *Foundations and Frontiers in Computer, Communication and Electrical Engineering*, Taylor and Francis, 2016.

[BC1] T. Majumder, **Abhinav Sinha**, R. K. Mishra, S. S. Singh, and P. K. Sahu, "Congestion control in Cognitive Radio Networks using fractional order rate reaching law based sliding modes, *Foundations and Frontiers in Computer, Communication and Electrical Engineering*, Taylor and Francis, 2016.

Peer Reviewed Conference Proceedings

[C42] U. Siddique, **Abhinav Sinha**, and Y. Cao, "Adaptive Event-triggered Reinforcement Learning Control for Complex Nonlinear Systems", *in Proc., American Control Conference (ACC)*, Denver, USA, 8th-10th July 2025.

[C41] R. Boyinine, A. Chakraborty, R. Sharma, and **Abhinav Sinha**, "Infrastructure Planning for Multi-Vehicle Routing with Cooperative Localization", *in Proc. 2025 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, Salt Lake City, USA, 28th Apr-1st May 2025.

[C40] S. Bajpai, R. Boyinine, **Abhinav Sinha**, and R. Sharma, "Toward Simultaneous Localization and Guidance for Collaborative Combat Aircraft (CCA) Effectiveness", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 6th-10th Jan 2025.

[C39] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Geometric Guidance for Enclosing Moving Targets", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 6th-10th Jan 2025.

[C38] P. K. Ranjan, **Abhinav Sinha**, and Y. Cao, "Relational Maneuvering Guidance Strategy for Leader-Follower Flexible Formation in Three Dimensions", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 6th-10th Jan 2025.

[C37] S. Bandela, **Abhinav Sinha**, and Y. Cao, "A Reinforcement Learning Approach to Target Capture in the Presence of a Defender", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 6th-10th Jan 2025.

[C36] M. Wu, U. Siddique, **Abhinav Sinha**, and Y. Cao, "Offline Reinforcement Learning with Failure Under Sparse Reward Environments", *in Proc., 3rd International Conference on Computing and Machine Intelligence (ICMI)*, Mt. Pleasant (Michigan), USA, 13th-14th Apr 2024.

[C35] U. Siddique, **Abhinav Sinha**, and Y. Cao, "On Deep Reinforcement Learning for Target Capture Autonomous Guidance", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 8th-12th Jan 2024.

[C34] P. K. Ranjan, **Abhinav Sinha**, and Y. Cao, "Robust UAV Guidance Law for Safe Target Circumnavigation with Limited Information and Autopilot Lag Considerations", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 8th-12th Jan 2024.

[C33] **Abhinav Sinha**, D. White, and Y. Cao, "Deep Reinforcement Learning-based Optimal Time-constrained Intercept Guidance", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 8th-12th Jan 2024.

[C32] S. Kumar, **Abhinav Sinha**, and S. R. Kumar, "Generic Path-following Guidance for an Autonomous Vehicle", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 8th-12th Jan 2024.

[C31] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Robust Nonlinear Control for Exact-time Stability of a Quadrotor UAV under Uncertainties", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 8th-12th Jan 2024.

[C30] R. Tabiyar, **Abhinav Sinha**, and S. R. Kumar, "Decentralized Cooperative Guidance for Time-constrained Rendezvous with Non-Accelerating Targets", *in Proc., 9th Indian Control Conference (ICC)*, Vishakhapatnam, India, 18th-20th Dec 2023.

[C29] **Abhinav Sinha**, and Y. Cao, "Three-dimensional Nonlinear Guidance Law for Target Circumnavigation", *in Proc., American Control Conference (ACC)*, San Diego, USA, 31st May-2nd Jun 2023.

[C28] **Abhinav Sinha**, and Y. Cao, "A Nonlinear Guidance Law for Target Enclosing with Arbitrary Smooth Shapes", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, National Harbor, USA, 23rd-27th Jan 2023.

[C27] P. K. Ranjan, **Abhinav Sinha**, Y. Cao, D. Tran, D. Casbeer, and I. Weintraub, "Energy-efficient Ring Formation Control with Constrained Inputs", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, National Harbor, USA, 23rd-27th Jan 2023.

[C26] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Robust Path-following Guidance for an Unmanned Vehicle", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, National Harbor, USA, 23rd-27th Jan 2023.

[C25] **Abhinav Sinha**, and S. R. Kumar, "Nonsingular Impact Time Guidance and Control Co-design against a Stationary Target", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, National Harbor, USA, 23rd-27th Jan 2023.

[C24] **Abhinav Sinha**, R. V. Nanavati, and S. R. Kumar, "Three-dimensional Nonlinear Impact Time Guidance using Predicted Interception Point", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, National Harbor, USA, 23rd-27th Jan 2023.

[C23] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Separate Guidance and Control Design for Autonomous Path-following", *in Proc., 22nd IFAC International Symposium on Automatic Control in Aerospace (ACA)*, Mumbai, India, 21st-25th Nov 2022.

[C22] S. K. Singh, **Abhinav Sinha**, and S. R. Kumar, "Nonlinear Control Design for an Unmanned Aerial Vehicle for Path Following", *IFAC PapersOnLine*, vol. 55, no. 1, pp. 592–597, 2022.

[C21] Iftisam, **Abhinav Sinha**, and S. R. Kumar, "Three-dimensional Nonlinear Impact Time Guidance Accounting for Autopilot Lag", *IFAC PapersOnLine*, vol. 55, no. 1, pp. 26–31, 2022.

[C20] **Abhinav Sinha**, R. V. Nanavati, and S. R. Kumar, "Impact Angle Constrained Integrated Guidance and Control for a Dual-controlled Interceptor", *in Proc., 7th Indian Control Conference (ICC)*, Mumbai, India, 20th-22nd Dec 2021.

[C19] **Abhinav Sinha**, and S. R. Kumar, "Cooperative Target Capture using Predefined-time Consensus", *in Proc., 7th Indian Control Conference (ICC)*, Mumbai, India, 20th-22nd Dec 2021.

[C18] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Cooperative Salvo Based Active Aircraft Defense using Impact Time Guidance", *in Proc., American Control Conference (ACC)*, New Orleans, USA, 25th-28th May 2021.

[C17] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Integrated Guidance and Control For Dual Control Interceptors Under Impact Time Constraint", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Virtual Event, 11th-15th and 19th-21st Jan 2021.

[C16] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Three-Dimensional Nonlinear Impact Time Guidance for Stationary Targets", *in Proc., American Control Conference (ACC)*, Denver, USA, 1st-3rd Jul 2020.

[C15] **Abhinav Sinha**, D. Mukherjee, and S. R. Kumar, "Deviated Pursuit based Cooperative Simultaneous Interception against Moving Targets", *in Proc., American Control Conference (ACC)*, Denver, USA, 1st-3rd Jul 2020.

[C14] H. Bishwash, **Abhinav Sinha**, and S. R. Kumar, "Deviated Pursuit Based Nonlinear Impact-Time Guidance with Finite-Time Convergence", *IFAC PapersOnLine*, vol. 53, no. 1, pp. 93–98, 2020, **Awarded Best Paper**.

[C13] **Abhinav Sinha**, and S. R. Kumar, "Super-Twisting Control Based Impact Time Constrained Guidance", *in Proc., Guidance, Navigation, and Control Conference (AIAA SciTech Forum)*, Orlando, USA, 6th-10th Jan 2020.

[C12] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Consensus Based Nonlinear Guidance for Cooperative Salvo", *in Proc., 6th Indian Control Conference (ICC)*, Hyderabad, India, 18th-20th Dec 2019.

[C11] **Abhinav Sinha**, R. Kumar, and R. Kaur, "Resource Efficient Control Strategy for Consensus Based Odour Source Localisation by Multiagent Systems", *accepted, 2018 IEEE Symposium Series on Computational Intelligence*, Bengaluru, India, 18th-21st Nov 2018.

[C10] **Abhinav Sinha**, and R. K. Mishra, "Convergence of multi-agent systems to unknown source of an odor", *in Proc., 2018 IEEE 3rd International Conference for Convergence in Technology*, Pune, India, 7th-8th Apr 2018.

[C9] **Abhinav Sinha**, and R. K. Mishra, "Temperature regulation in a Continuous Stirred Tank Reactor using event triggered sliding mode control", *IFAC PapersOnLine*, vol. 51, no. 1, pp. 401–406, 2018.

[C8] T. Majumder, **Abhinav Sinha**, R. K. Mishra, S. S. Singh, and P. K. Sahu, "Robust nonlinear congestion controller for time delayed and uncertain cognitive radio based wireless network", *in Proc., 2015 IEEE Power, Communication and Information Technology Conference (PCITC)*, Bhubaneswar, India, 15th-17th Oct 2015.

[C7] **Abhinav Sinha**, and R. K. Mishra, "Sliding mode controller design for high performance of permanent magnet stepper motor", *in Proc., 2015 IEEE International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS)*, Coimbatore, India, 19th-20th Mar 2015.

[C6] **Abhinav Sinha**, and R. K. Mishra, "Robust altitude tracking of a miniature helicopter UAV based on sliding mode", *in Proc., 2015 IEEE International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS)*, Coimbatore, India, 19th-20th Mar 2015.

[C5] T. Majumder, **Abhinav Sinha**, R. K. Mishra, S. S. Singh, and P. K. Sahu, "Robust nonlinear congestion controller for cognitive radio based wireless network", *in Proc., 2015 IEEE International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS)*, Coimbatore, India, 19th-20th Mar 2015.

[C4] **Abhinav Sinha**, R. K. Mishra, and S. Jaiswal, "Robust and Smooth Nonlinear Control of an Industrial Robot for Automated Pick and Place", *in Proc., 2015 IEEE International Conference on Computing Communication Control and Automation (ICCUBEA)*, Pune, India, 26th-27th Feb 2015, **Awarded Best Paper**.

[C3] **Abhinav Sinha**, P. Prasoon, P. K. Bharadwaj, and A. C. Ranasinghe , "Nonlinear Autonomous Control of a Two-Wheeled Inverted Pendulum Mobile Robot Based on Sliding Mode", *in Proc., 2015 IEEE International Conference on Computational Intelligence and Networks (CINE)*, Bhubaneswar, India, 12th-13th Jan 2015.

[C2] A. C. Ranasinghe, K. Rasnayake, **Abhinav Sinha**, and K. K. Rasnayake, "Perturbing effect compensation technique for smart sensors", *in Proc., 7th IEEE International Conference on Information and Automation for Sustainability (ICIAfS)*, Colombo, Sri Lanka, 22nd-24th Dec 2014.

[C1] **Abhinav Sinha**, and R. K. Mishra, "Smooth sliding mode controller design for robotic arm", *in Proc., 2013 International Conference on Control, Automation, Robotics and Embedded Systems (CARE)*, Jabalpur, India, 16th-18th Dec 2013.

Others

[A4] S. Kumar, S. R. Kumar, and **Abhinav Sinha**, "Three-Dimensional Nonlinear Path-Following Guidance for UAVs", *in 8th Cyber-Physical Systems Symposium*, Bangalore, India, 25th Jul-27th Jul 2024.

[A3] U. Siddique, **Abhinav Sinha**, and Y. Cao, "Fairness in Preference-based Reinforcement Learning", *in 41st International Conference on Machine Learning (ICML) Workshop : The Many Facets of Preference-Based Learning*, Honolulu, USA, 26th Jul-27th Jul 2023.

[A2] **Abhinav Sinha**, S. R. Kumar, and D. Mukherjee, "Integrated Guidance and Control Design For Time-Constrained Interception", *IEEE TechRxiv*, 2020.

[A1] **Abhinav Sinha**, R. Kaur, R. Kumar, and A. P. Bhondekar, "Cooperative control of multi-agent systems to locate source of an odor", *arXiv:1711.03819, arXiv e-prints*, 2017.

Grants

[G2] 2025-2027 : Principal Investigator, **AIR-GAME CCA : Autonomous Information-Driven Response for Guided Autonomous Missions and Engagement in Collaborative Combat Aircraft**, The US Air Force Research Labs

[G1] 2024-2025 : Principal Investigator, **CO AIR : Cooperative Operation of Assets using Intelligent Reinforcements to Enhance the Collaborative Combat Aircraft Capability**, UtopiaCompression Corporation and AFWERX

Courses Taught/Offered

- AEEM 5115/6015 : Modern Control, Spring 2025
- AEEM 4042 : Fundamentals of Control Theory, Fall 2024, Fall 2025
- AEEM 8060 : UAV Capstone, Fall 2025
- AEEM 9074 : Introduction to Navigation and Guidance, every Fall
- AEEM 9074 : Control of Networked Cyber-Physical Systems, every Spring
- AEEM 2013 : Introduction to Systems Engineering, Spring 2024

Invited Talks, Seminars, Tutorials

[T2] Jan 2025 : **On the Lady, the Bandit, and the Bodyguard Problem : Cooperative Guidance Strategies for Guaranteed Pursuit-Evasion**, UC-AEEM Graduate Seminar Series

[T1] Jan 2025 : **On the Lady, the Bandit, and the Bodyguard Problem : Cooperative Guidance Strategies for Guaranteed Pursuit-Evasion**, Short Term Course cum Faculty Development Program On Advances in Control, Estimation & Optimization For Cyber-Physical Systems (ACEOCPS), NIT Rourkela

Students Advised/Mentored, Staffs

Postdoctoral Research Fellow

[P1] Rohith Boyinine (2025–)

Doctoral Students

[D2] Liam McKenna (2025–)

[D1] Shivam Bajpai (2024–)

Masters Students

[M4] Sandeep Bandarupalli (2024–), currently intern at LeanQubit Inc., Ohio

[M3] Mukhtar Ahmed (2025)

[M2] Liam McKenna (2025), next : Air Force Institute of Technology, WPAFB, Ohio

[M1] Jayanth Ammapalli (2025), next : UtopiaCompression Corporation, California

Bachelor Students

[B2] Pragyat Sood (2024–)

[B1] Hari Narayanan Sathyanarayanan (2024)

Professional Services

Editorial Positions

- Guest Associate Editor (Special Session on Safety, Robustness, and Effectiveness in Human-Machine Teaming), IEEE Control Systems Letters
- Track Chair (Control, Robotic, Network, and System Sciences and Technologies), 2025 IEEE 11th World Forum on Internet of Things (WF-IoT)

Reviewer of Refereed Journals

- IEEE Transactions on Automatic Control
- Automatica
- International Journal of Control
- IEEE Transactions on Control Systems Technology
- International Journal of Robust and Nonlinear Control
- Systems and Control Letters
- IEEE Transactions on Control of Network Systems
- IEEE Transactions on System, Man and Cybernetics : Systems
- IEEE Transactions on Cybernetics
- Journal of The Franklin Institute
- European Journal of Control
- IET Control Theory and Applications
- AIAA Journal of Guidance, Control, and Dynamics
- IEEE Control Systems Letters
- IEEE Robotics and Automation Letters
- IEEE Transactions on Fuzzy Systems
- IEEE Transactions on Aerospace and Electronic Systems
- Journal of Intelligent & Robotic Systems
- Aerospace Science and Technology
- IEEE Transactions on Neural Networks and Learning Systems
- Asian Journal of Control
- Information Sciences
- ASME Journal of Dynamic Systems, Measurement, and Control
- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Industrial Informatics
- ISA Transactions
- Journal of Process Control
- IEEE Access
- Defence Technology
- IEEE Systems Journal
- IEEE Sensors Letters
- Nonlinear Dynamics
- Advances in Space Research
- IET Generation, Transmission and Distribution
- Chemical Engineering Science
- Asia Pacific Journal of Chemical Engineering
- Journal of Computational Science
- Neurocomputing
- Swarm Intelligence
- IET Power Electronics
- Journal of Aerospace Engineering
- IEEE Journal of Emerging and Selected Topics in Industrial Electronics

- Plos One
- The Aeronautical Journal
- The Journal of the Astronautical Sciences
- IEEE Journal of Oceanic Engineering
- IEEE Transactions on Network Science and Engineering
- IEEE Open Journal of Control Systems
- IEEE Transactions on Automation Science and Engineering

Reviewer of Peer Reviewed Conferences (Selected)

- American Control Conference (ACC)
- Control and Decision Conference (CDC)
- Indian Control Conference (ICC)
- European Control Conference (ECC)
- AIAA SciTech Forum
- IFAC World Congress
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- International Workshop on Variable Structure Systems and Sliding Mode Control (VSS)
- International Conference on Control, Decision and Information Technologies (CoDIT)
- International Conference on Control and Automation (ICCA)
- Mediterranean Conference on Control and Automation (MED)
- International Conference on Unmanned Aircraft Systems (ICUAS)
- IFAC Advances in Control and Optimization of Dynamical Systems (ACODS)
- IFAC Symposium on Automatic Control in Aerospace (ACA)
- IEEE Conference on Control Technologies and Applications (CCTA)
- International Conference on Automation and Computing

Activities of Technical Committees

- Sub-committee Chair (Membership/Website, 2023-Present) of the IEEE CSS TC on Manufacturing Automation and Robotic Control
- Chair of Session on **GNC-26/IS-24 : Guidance, Navigation, and Control in Intelligent Systems** at the AIAA 2025 SciTech Forum, Orlando, USA, 6th Jul-10th Jan 2025.
- Chair and Organizer (co-organizer : Yongcan Cao, UTSA) of Invited Session on **Synergistic Strategies for Cyber-Physical-Human Systems** at the American Control Conference (ACC), Denver, USA, 8th Jul-10th Jul 2025.
- Organizer (co-organizers : Yongcan Cao, UTSA and Xiaocong Li, Harvard University/A*STAR Singapore) of Session on **Control Technologies and Solutions for Sustainable Energy Systems** at the IEEE CSS Day 2024.
- Chair and Organizer (co-organizers : Yongcan Cao, UTSA and David Casbeer, AFRL) of Invited Session on **Control of Cyber-Physical Systems : Multidisciplinary Approaches in Robotics, Autonomy, Optimization, and Safety** at the American Control Conference (ACC), Toronto, Canada, 8th Jul-12th Jul 2024.
- Organizer (co-organizers : Yongcan Cao, UTSA and Eloy Garcia, AFRL) of Invited Session on **Methods in Robotics, Optimization, Learning, and Safety for Control of Cyber-Physical Systems** at the American Control Conference (ACC), San Diego, USA, 31st May-2nd Jun 2023.
- Co-chair, Session on **Aerospace** at the American Control Conference (ACC), San Diego, USA, 31st May-2nd Jun 2023.

Professional Memberships

- **Life Member**, IITB Alumni Association
- **Senior Member**, Institute of Electrical and Electronics Engineers (IEEE)

- ➜ IEEE Aerospace and Electronic Systems Society (AESS)
- ➜ IEEE Control Systems Society (CSS)
- ➜ IEEE Robotics and Automation Society (RAS)
- ➜ **Sub-committee chair**, IEEE CSS Technical Committee on Manufacturing, Automation, and Robotic Control
- ➜ IEEE CSS Technical Committee on Aerospace Controls
- ➜ IEEE CSS Technical Committee on Automotive Controls
- ➜ IEEE CSS Technical Committee on Control Education

- **Senior Member**, American Institute of Aeronautics and Astronautics (AIAA)
- **Member**, International Federation of Automatic Control (IFAC)
  - ➜ IFAC Automatic Control and Dynamic Optimization Society (ACDOS)
- **Member**, Asian Control Association

Awards, Achievements and Honorable Mentions

- **Naik and Rastogi Award for Excellence in Ph.D. Research** — Aug 2022
  Indian Institute of Technology Bombay, India

- **ACC Student Travel Grant** — May 2021
  American Automatic Control Council, USA

- **ACC Student Travel Grant** — Jun 2020
  American Automatic Control Council, USA

- **ICC Student Support** — Dec 2019
  Indian Control Conference and IEEE-CSS

- **MHRD Postgraduate GATE Fellowship for Ph.D.** — Jul 2018 - Apr 2021
  Ministry of Human Resource Development, India

- **MHRD Postgraduate GATE Fellowship for M.Tech** — Jul 2016 - Jun 2018
  Ministry of Human Resource Development, India

- **Champions of Initial Learning Programme (ILP)** — Dec 2015
  TATA Consultancy Services Limited

- **On The Spot Award** — Jul 2015
  TATA Consultancy Services Limited

- **Outstanding Contribution Award** — Aug 2013
  KIIT Robotics Society, Kalinga Institute of Industrial Technology