Ratnangshu Das

Ph.D., Prime Minister's Research Fellow (PMRF)
ROBERT BOSCH CENTRE FOR CYBER-PHYSICAL SYSTEMS
Indian Institute of Science, Bangalore

(+91) 8017610875 ratnangshud@iisc.ac.in Linkedin GitHub Google Scholar

Education

Year	Degree	Institution (Board)	GPA/Percentage
2023-Present	Ph.D., ROBERT BOSCH CENTRE FOR CYBER-PHYSICAL SYSTEMS	Indian Institute of Science, Bangalore, India	GPA: 9.3/10.0
2017-2022	BT-MT Dual Degree, Mechanical Engineering	Indian Institute of Technology, Kanpur, India	GPA: 10.0/10.0(PG) | 9.5/10.0(UG)
2017	Indian School Certificate Examination (Intermediate)	St. Stephen's School, Kolkata, India	Percentage: 96.2%
2015	Indian Certificate of Secondary Education (Matriculation)	St. Stephen's School, Kolkata, India	Percentage: 96.6%

Research Experience

Formal Control of Autonomous Systems — *Bangalore, India*
Supervisor: Dr. Pushpak Jagtap, *RBCCPS, IISc Bengaluru*, — *Jan 2023 - Present*

Telemedicine and Medical Robotics — *Kanpur, India*
CoE: Telemedicine and Healthcare Robotics, GSMST, IIT Kanpur — *June 2022 - Dec 2022*

Experimental Study and Modelling of Trust in Child Robot Interaction — *Kanpur, India*
Supervisor: Dr. Bishakh Bhattacharya, *Dept. of Mechanical Engineering, IIT Kanpur*, — *May 2021 - Dec 2022*
Co-supervisor: Dr. Mayank Shekhar Jha, *CRAN, Polytech Nancy, Universite de Lorraine, France*,

Ungrounded force feedback in portable haptic devices — *Delft, Netherlands*
Supervisor: Dr. Yasemin Vardar, *Cognitive Robotics Department*, *HITLab, Delft University of Technology*, — *May 2021 - Nov 2021*

Haptipedia, a database of numerous haptic devices — *Stuttgart, Germany*
Supervisor: Dr. Katherine J. Kuchenbecker, *Haptic Intelligence Department, MPI-IS*, — *June 2020 - Sept 2020*

Humanoid Robotics, IIT Kanpur — *Kanpur, India*
Supervisor: Dr. Indranil Saha, *Dept. of Computer Science and Engineering, IIT Kanpur* — *Dec. 2017 - April 2020*

List of Recent Publications and Patents

1. Das, R., Sawarkar, S., & Jagtap, P. (2025). Scalable and Approximation-free Symbolic Control for Unknown Euler-Lagrange Systems. arXiv preprint arXiv:2509.19859. (submitted to Automatica)
2. Das, R., Basu, A., & Jagtap, P. (2025). Spatiotemporal tubes for temporal reach-avoid-stay tasks in unknown systems. IEEE Transactions on Automatic Control.
3. Das, R., Basu, A., & Jagtap, P. (2025). Spatiotemporal Tubes Based Control of Unknown Multi-Agent Systems for Temporal Reach-Avoid-Stay Tasks. IEEE Transactions on Control of Network Systems.
4. Das, R., Choudhury, S., & Jagtap, P. (2025). Approximation-free Control for Signal Temporal Logic Specifications using Spatiotemporal Tubes. IEEE Control Systems Letters.
5. Das, R., Upadhyay, S., & Jagtap, P. (2025). Incorporating Social Awareness into Control of Unknown Multi-Agent Systems: A Real-Time Spatiotemporal Tubes Approach. arXiv preprint arXiv:2510.25597. (submitted to Automatica)
6. Si, Y. A., Das, R., Monir, N., Soudjani, S., Jagtap, P., & Saoud, A. (2025). Maximally Resilient Controllers under Temporal Logic Specifications. arXiv preprint arXiv:2509.01777. (Accepted in CDC, 2025)
7. Monir, N., Si, Y. A., Das, R., Jagtap, P., Saoud, A., & Soudjani, S. (2025). Computation of Feasible Assume-Guarantee Contracts: A Resilience-based Approach. arXiv preprint arXiv:2509.01832. (Accepted in CDC, 2025)
8. Das, R., Bakshi, P., & Jagtap, P. (2025). Control Barrier Functions for Prescribed-time Reach-Avoid-Stay Tasks using Spatiotemporal Tubes. arXiv preprint arXiv:2503.08106. (Accepted in ECC, 2025)
9. Faruqui, M., Das, R., & Jagtap, P. (2025). Reach-Avoid-Stay-Collision-Avoidance Negotiation Framework for Multi-Agent Systems via Spatiotemporal Tubes. arXiv preprint arXiv:2503.10245. (Accepted in ECC, 2025)
10. Das, R., & Jagtap, P. (2024). Prescribed-time reach-avoid-stay specifications for unknown systems: A spatiotemporal tubes approach. IEEE Control Systems Letters.
11. Das, R., & Jagtap, P. (2024, December). Funnel-based control for reach-avoid-stay specifications. In 2024 Tenth Indian Control Conference (ICC) (pp. 54-59). IEEE.
12. Das, R., & Jagtap, P. (2024, May). Spatiotemporal Tubes for Reach-Avoid-Stay Specifications. In Proceedings of the 27th ACM International Conference on Hybrid Systems: Computation and Control (pp. 1-2).
13. Juvvi, M. S., Sundarsingh, D. S., Das, R., & Jagtap, P. (2024, May). Safe Multi-Robot Exploration using Symbolic Control. In 2024 IEEE International Conference on Robotics and Automation (ICRA) (pp. 11619-11625). IEEE.
14. Yadav, P., Jain, N., Das, R., & Saha, I. (2024). Computer-Implemented stigma separation systen and method for separating stigmas from flowers. Indian Patent No. 564565, Patent Application No. 202311082765, filed Jan 2024.
15. Das, R., Baishya, N. J., & Bhattacharya, B. (2023). A review on tele-manipulators for remote diagnostic procedures and surgery. CSI Transactions on ICT, 11(1), 31-37.

Technical Skills

Maple • MATLAB • Python • Arduino • AutoCAD • Autodesk Inventor • Git • LaTeX • Linux • ROS • Simulink

Teaching Assistantship

- **Instructor**, Formal Analysis and Control of Autonomous Systems, ISSS. *May 2024 - Jun 2025*
- **Teaching Assistant**, CP275, Formal Analysis and Control, IISc Bengaluru. *Jan 2025 - April 2025*
- **Instructor**, Robot Learning and Control, ISSS. *Dec 2024 - Jan 2025*
- **Teaching Assistant**, E1 316o, Deep Learning for Robotics, IISc Bengaluru (Online). *May 2024 - July 2024*
- **Instructor**, Linear Control Systems, ISSS. *Mar 2024 - April 2024*
- **Instructor**, Applied Nonlinear Control Systems, ISSS. *June 2024 - Aug 2024*
- **Teaching Assistant**, CP241, Applied Linear and Nonlinear Control, IISc Bengaluru. *Aug 2023 - Dec 2023*
- **Instructor**, Analysis of Nonlinear Systems, ISSS. *May 2023 - June 2023*
- **Teaching Assistant**, ME354A, Vibration & Control, IIT Kanpur. *Jan 2022 - May 2022*
- **Teaching Assistant**, ME352A, Theory Of Mechanisms & Machines, IIT Kanpur. *Aug 2021 - Dec 2021*

Honors and Awards

- *2024*, **Best Student Paper Award**, In the Tenth IEEE Indian Control Conference (ICC).
- *2023*, **PMRF**: Selected as Prime Minister's Research Fellow.
- *2022*, **SIIC Student Innovation Award**: For the best innovative project in path-breaking technology of global importance.
- *2022*, *2021*, *2020*, Academic Excellence Award
- *2018*, Second prize in **TCTD challenge**, Inter IIT, IIT Bombay.
- *2017*, All India Rank 1201, Joint Entrance Exam Advanced, 200,000 candidates, India.
- *2017*, All India Rank 1207, Joint Entrance Exam Main, 1.5 million candidates, India.
- *2016*, KVPY Scholarship Awardee, Indian Institute of Science.
- *2015*, NTSE Scholarship Awardee, National Council of Educational Research and Training.

References

Pushpak Jagtap
Assistant Professor, Robert Bosch Centre for Cyber-Physical Systems, IISc Bangalore, India
Email: pushpak@iisc.ac.in
Relationship: PhD Supervisor

Sadegh Soudjani
Senior Research Group Leader, Max Planck Institute for Software Systems (MPI-SWS), Germany
Professor, Chair in Cyber-Physical Systems, Director of Global Engagement, University of Birmingham, United Kingdom
Email: sadegh@mpi-sws.org
Relationship: Research Collaborator

Adnane Saoud
Assistant Professor, University Mohammed IV Polytechnic (UM6P), Benguerir, Morocco
Email: Adnane.SAOUD@um6p.ma
Relationship: Research Collaborator

Christos Verginis
Assistant Professor, Division of Signals and Systems, Department of Electrical Engineering, Uppsala University, Sweden
Email: christos.verginis@angstrom.uu.se
Relationship: Research Collaborator

Indranil Saha
Professor, Department of Computer Science and Engineering, Professor and Head, Department of Intelligent Systems, Indian Institute of Technology Kanpur, India
Email: isaha@cse.iitk.ac.in
Relationship: Research Collaborator

Bishakh Bhattacharya
Professor, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India
Email: bishakh@iitk.ac.in
Relationship: M.Tech Supervisor