

DR. SAYAK ROYCHOWDHURY

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CURRENT POSITION

- **Department of Industrial & Systems Engineering (ISE), Indian Institute of Technology, Kharagpur, India: Assistant Professor Grade -I since July 2018.**

EDUCATION

- **The Ohio State University (USA), Ph.D in Industrial and Systems Engineering, Aug 2017.**
- **The Ohio State University (USA), M.S. in Industrial and Systems Engineering, Aug 2014.**
- **Jadavpur University (Kolkata, India), B.E. in Electrical Engineering, Dec 2008.**

INDUSTRIAL EXPERIENCE (4+ years)

- **Netjets Inc., Senior Operational Analyst: Columbus, OH, USA, June 2017-July 2018**
- **Ford, Data Science Intern (Global Data Insight & Analytics): Dearborn, MI, USA May 2016-August 2016**
- **Siemens, Executive Engineer: Kolkata, India July 2008-June 2011**

COURSES TAUGHT AT ISE, IIT KHARAGPUR

1. **Statistical Learning with Applications (IM31202)**
2. **Statistical Learning Laboratory (IM39202)**
3. **Applied Reinforcement Learning and Optimization (IM61203)**
4. **Quality Engineering (IM31002)**
5. **Applied Multivariate Statistical Modelling II (IM60056)**
6. **Quality Design and Control Laboratory (IM39005)**
7. **Statistical Process Control (IM60023)**
8. **Project Engineering and Management (IM60051)**

TEACHING EXPERIENCE AT THE OHIO STATE UNIVERSITY

1. **Statistical Quality Control (ISE4120, as instructor and TA)**
2. **Introduction to Manufacturing Engineering Laboratory (ISE 2500, as lab instructor and TA)**

ADMINISTRATIVE POSITIONS

- **Program Officer of National Service Scheme (NSS) IIT Kharagpur, January 2023 – June 2025**
- **Assistant Warden, MS Hall, IIT Kharagpur January 2023 – December 2023**
- **Faculty Adviser of incoming UG Batch, ISE, IIT Kharagpur 2019**
- **Examination-in-charge of ISE, IIT Kharagpur since 2019**

PROJECT SUPERVISION (AS PI) AT IIT KHARAGPUR

- Community-based Capacity Building and Scientific Interventions for Sustainable livelihood in Mayurbhanj District, Odisha -Phase I (2026 – ongoing)
- Socio-economic Impact of Migration during COVID-19 Crisis in the Sundarbans Region: A Study of Sustainable Solutions using Geo-spatial Analytics, sponsored by DST-NGP (2021-23)
- ISIRD 2019: Development of Reinforcement Learning Methods for Cybersecurity and Reliability for a Fleet of Remote Unmanned Mobile Units, IIT Kharagpur 2019

COURSE/LABORATORY DEVELOPMENT AT IIT KHARAGPUR

- Cofounder and Member of Game Theory, Statistics and Economic Systems Laboratory
- Quality analytics with AI/ML module developed for Quality Design and Control Laboratory (IM39202)
- Developed Applied Reinforcement Learning and Optimization (IM61203) course
- Developed Statistical Learning with Applications (IM31202) course
- Developed laboratory curriculum for Statistical Learning Laboratory (IM39202)

PHD STUDENT MENTORSHIP AT IIT KHARAGPUR

- Akshay Bhosale (PhD, completed, now assistant professor in IIM Amritsar)
- Chayanika Burman (PhD, ongoing)
- Imran Khan (PhD, ongoing)
- Saptarshi Das (PhD, jointly with Prof. J. Maiti, ongoing)

JOURNAL PUBLICATIONS

1. Tanaji, B. A., Roychowdhury, S., & Abraham, A. (2025). Cybersecurity resource allocation for connected and autonomous vehicles using Bayesian games. *Reliability Engineering & System Safety*, 111470.
2. B. A. Tanaji and S. Roychowdhury, "A Survey of Cybersecurity Challenges and Mitigation Techniques for Connected and Autonomous Vehicles," in *IEEE Transactions on Intelligent Vehicles*, vol. 10, no. 10, pp. 4742-4757, Oct. 2025, doi: 10.1109/TIV.2024.3493938.
3. Tanaji, B. A., & Roychowdhury, S. (2024). BWM Integrated VIKOR method using Neutrosophic fuzzy sets for cybersecurity risk assessment of connected and autonomous vehicles. *Applied Soft Computing*, 159, 111628.
4. Kakde, S. T., Roychowdhury, S., Bhosale, A. T., & Maiti, J. (2024). CPAN chart: A Novel Customer Perception Analysis System Using Natural Language Processing and Attribute Control Charting. *IEEE Transactions on Engineering Management*.
5. Singh, K., Maiti, J., & Roychowdhury, S. (2022). A data-driven penalty-reward methodology for performance assessment of risk control systems. *Journal of Loss Prevention in the Process Industries*, 77, 104756.

6. Liu, E., Allen, T. T., & Roychowdhury, S. (2019). Cyber vulnerability maintenance policies that address the incomplete nature of inspection. *Applied Stochastic Models in Business and Industry*, 35(6), 1390-1410.
7. Allen, T. T., Roychowdhury, S., & Liu, E. (2018). Reward-based Monte Carlo-Bayesian reinforcement learning for cyber preventive maintenance. *Computers & Industrial Engineering*, 126, 578-594.
8. Roychowdhury, S., Allen, T. T., & Allen, N. B. (2017). A Genetic Algorithm with an Earliest Due Date Encoding for Scheduling Automotive Stamping Operations. *Computers & Industrial Engineering*.

BOOK CHAPTERS

1. Das, S., Roychowdhury, S., Ghosh, S. (2026). Convergent Technologies Empowering Human–Computer Interaction in Programmable Logic Controllers for an Affordable Industry 4.0 Integration. In: Maiti, J., Jenamani, M., Kumar, S.K., Menon, B.G., Abraham, A.J., Sharma, A. (eds) *Recent Advances in Industrial and Systems Engineering. Lecture Notes on Multidisciplinary Industrial Engineering*. Springer, Singapore. https://doi.org/10.1007/978-981-96-8323-9_13
2. Tanaji, B.A., Roychowdhury, S., Abraham, A. (2026). Optimal Resource Allocation for Multi-target Attacker-Defender Game Against Cyber-Attack in Connected and Autonomous Vehicles. In: Maiti, J., Jenamani, M., Jha, J.K., Kumar, A., Roychowdhury, S., Sen, G. (eds) *Operations Research and Data Analytics: Current Trends and Future Perspectives. Lecture Notes on Multidisciplinary Industrial Engineering*. Springer, Singapore. https://doi.org/10.1007/978-981-96-8327-7_25

EDITED BOOKS

1. Maiti, J., Jenamani, M., Jha, J. K., Kumar, A., Roychowdhury, S., & Sen, G. (Eds.). (2026). *Operations Research and Data Analytics: Current Trends and Future Perspectives: Selected Papers from International Conference on Industrial Engineering and Analytics (ICONIEA) 2024* (1st ed., Lecture Notes on Multidisciplinary Industrial Engineering). Springer Singapore. <https://doi.org/10.1007/978-981-96-8327-7>

CONFERENCE PROCEEDINGS

1. Sinha, P., Roychowdhury, S., & Tanaji, B. A. (2024, April). Customer feedback analysis using aspect based sentiment analysis and fuzzy analytic hierarchy process. In 2024 IEEE 9th international conference for convergence in technology (I2CT) (pp. 1-6). IEEE.
2. Pisal, K., & Roychowdhury, S. (2022). Cyber-Defense Mechanism Considering Incomplete Information Using POMDP. In *International Conference on Network Security and Blockchain Technology* (pp. 3-17). Springer, Singapore.
3. Das, S., Roychowdhury, S., & Maiti, J. (2021, December). Risk Assessment in the Calibration of Medical Equipment. In 2021 International Conference on Maintenance and Intelligent Asset Management (ICMIAM) (pp. 1-6). IEEE.

4. Bhallavi, T., Roychowdhury, S., Bhosale, A., & Tiwari, A. (2021, December). Network Intrusion Detection using Principal Component–Mahalanobis Taguchi System (PC-MTS) Approach. In 2021 International Conference on Maintenance and Intelligent Asset Management (ICMIAM) (pp. 1-6). IEEE.
5. Allen, T. T., Hernandez, O. K., Roychowdhury, S., & Patterson, E. S. (2020, September). Practical Optimal Scheduling for Surgery. In Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care (Vol. 9, No. 1, pp. 10-14). Sage CA: Los Angeles, CA: SAGE Publications.
6. Roychowdhury, S. and Brevick J.R. (2014), Investigation of Flash-free Die Casting, NADCA Transactions (2014).

CONFERENCE PRESENTATIONS

1. Tanaji, B. A., Roychowdhury, S., & Abraham, A. (2025). Platooning as a service (PlaaS) for connected and autonomous vehicles, EUROMA 2025, Milan, Italy
2. Roychowdhury, S. , Mishra, P (2022) Socio-economic Impact of Migration during COVID-19 Crisis in the Sundarbans Region: A Study of Sustainable Solutions using Geo-spatial Analytics, UNWGIC (2022)
3. Roychowdhury, S. and Allen, T. T. (2016), Optimal Learning with Bayesian Adaptive Markov Decision Process for Cyber Vulnerability Analysis. Contributed INFORMS Abstract.
4. Roychowdhury, S. and Allen, T. T. (2015), Heuristic Methods For Automotive Stamping Scheduling. Contributed INFORMS Abstract.
5. Roychowdhury, S. and Allen, T. T. (2014), Sequential Kriging Optimization to Determine the Cost-Effective Number of Early Voting Days. Invited INFORMS Abstract.
6. Roychowdhury, S. and Allen, T. T. (2014), Hybrid Sequential Kriging Optimization using Gradient Descent. Invited INFORMS Abstract.
7. Roychowdhury, S. and Allen, T. T. (2013), Addressing Multiple Responses Using Sequential Kriging Optimization. Contributed. JSM Abstract.