

Satyam Paul

PhD in Control Systems



Profile

Satyam Paul is a Senior Lecturer and Researcher in Mechanical Engineering at Örebro University, Sweden, with over 15 years of combined academic, research, and industrial experience. His expertise lies in control systems, vibration control, automatic fault detection, predictive maintenance, and advanced diagnostic techniques for mechanical and electromechanical systems. His research focuses on improving system performance, reliability, safety, and operational efficiency through nonlinear control, intelligent control, fuzzy systems, sliding mode control, and model-based fault detection. He has led and contributed to several academic and industry-oriented research projects involving vibration attenuation, condition monitoring, prototype test rigs, and intelligent diagnostics. Dr. Paul has international academic and research experience from Sweden, the United Kingdom, Mexico, and India. He holds a PhD in Automatic Control and has authored a technical book, book chapters, and several peer-reviewed journal and conference publications in the fields of control systems, vibration control, fault detection, and intelligent engineering systems.

Employment

Senior Lecturer

Apr 2025 - Present

Örebro University, Örebro, Sweden

Currently working as a Senior Lecturer in the Department of Mechanical Engineering at Örebro University. My role combines teaching, research, supervision, and course development, with a research focus on automatic fault detection, predictive maintenance, vibration control, and condition monitoring of mechanical systems. I deliver lectures at undergraduate and postgraduate levels, develop and update course materials, and supervise bachelor's and master's student projects and theses. In addition, I actively contribute to creating a research-informed and collaborative learning environment by integrating current research findings, industrial examples, and practical engineering applications into teaching. My work aims to strengthen students' theoretical understanding, practical problem-solving skills, and ability to apply mechanical and control engineering concepts in real-world contexts.

Assistant Professor-Research

Aug 2023 - Mar 2025

Mälardalens University, Västerås, Sweden

Worked as an Assistant Professor-Research, conducting research in control systems with applications in product design and development. My work focused on design optimization, simulation, diagnostics, and the integration of advanced control and analysis methods to support reliable and efficient engineering solutions. Alongside my research responsibilities, I contributed to teaching in product design and development-related courses and supervised bachelor's and master's students in their research projects and theses. My role involved supporting students in developing strong analytical, technical, and problem-solving skills while connecting theoretical knowledge with practical engineering applications.

Senior Research Fellow in Control Systems

Jan 2022 - Jul 2023

University of Nottingham, Nottingham, United Kingdom

Worked as a Senior Research Fellow in Control Systems at the Gas Turbine and Transmission Research Centre, University of Nottingham, on a Cornerstone-funded project in collaboration with the University of Oxford, Imperial College London, and Rolls-Royce, UK. My research focused on the development of optimization algorithms and advanced control strategies for gas turbine systems, with the aim of improving performance, efficiency, and operational reliability. I also provided control systems expertise and strategic technical support to collaborative research teams at the University of Oxford and Imperial College London. In addition to my research responsibilities, I contributed to teaching activities by delivering lectures and supporting courses in Dynamical Systems.

Control Engineering Tutor

Jan 2023 - Jul 2023

University of Cambridge: Contract (Online), Cambridge, United Kingdom

Worked as a part-time Control Engineering Tutor, delivering online teaching, academic guidance, and assessment support for Control Engineering projects. My role focused on supporting students in monitoring, evaluation, and the practical application of control systems concepts. I conducted virtual teaching and supervision sessions,

Personal details



Satyam Paul



satyam.controlsistemas@gmail.com



+46-0735787840



Västerås
72476 Sweden



scholar.google.com/citations?hl=en&authuser=1&user=7TROBxwAAAAJ



linkedin.com/in/satyam-paul-baba4815



orcid.org/0000-0003-4720-0897

Skills and Expertise

Control Systems

Dynamics and Control

Stability Analysis

Lyapunov Stability Analysis

Fault Detection

Predictive Maintenance

Fuzzy Control

Matlab/Simulink

LabVIEW

Research Supervision

Course Development

Academic Teaching

provided detailed grading and constructive feedback, and helped students strengthen their technical understanding, analytical thinking, and project development skills. This fully online role required strong communication, adaptability, and the ability to maintain student engagement and academic standards in a remote learning environment.

Assistant Professor in Mechatronics

Mar 2020 - Jan 2022

[University of the West of England, Bristol, United Kingdom](#)

Worked as an Assistant Professor in Mechatronics, contributing to teaching, research, academic supervision, and curriculum development. I served as Module Leader for Control Engineering and Programme Leader for a Degree Apprenticeship programme, with responsibilities including course delivery, assessment, student support, and programme coordination. I supervised several bachelor's and master's student projects, supporting students in developing both theoretical knowledge and practical engineering skills. I also served as Theme Leader for Control Engineering/Mechatronics, contributing to research direction and curriculum development in the area. My research focused on intelligent and robust control methods for vibration control and fault detection, including fuzzy-tuned PID control for agricultural manipulators, sliding mode control for robotic manipulators, and automatic fault detection in manufacturing systems. I delivered lectures and project-based teaching using MATLAB/Simulink, SolidWorks, LabVIEW, Blackboard, and Canvas, while contributing to a collaborative academic environment and supporting high standards in teaching and research.

Assistant Professor

Jan 2012 - Dec 2013

[Sir Padampat Singhania University, Udaipur, Rajasthan, India](#)

Worked as an Assistant Professor, contributing to teaching, research, academic supervision, and student project mentoring in Mechanical and Control Engineering. I taught a broad range of undergraduate and postgraduate courses, including Mechatronics, Linear Control, Nonlinear Control, Control Systems, Solid Mechanics, Strength of Materials, Fluid Mechanics, Engineering Drawing, and Elements of Mechanical Engineering. In addition to teaching, I was actively involved in research activities and supported students as a project guide and academic mentor. I encouraged students to develop innovative, application-oriented engineering projects and strengthened their theoretical understanding, technical skills, and professional confidence. This role required strong subject expertise, effective communication, and the ability to inspire students toward academic and professional excellence.

Assistant Professor

Jun 2009 - Jan 2012

[Sikkim Manipal Institute of Technology, Sikkim, Gangtok](#)

Worked as an Assistant Professor, contributing to teaching, research, and student project supervision in Mechanical Engineering and Control Systems. I taught a wide range of undergraduate courses, including Instrumentation and Control, Hydraulic Machines, Fluid Mechanics, Thermodynamics, Machine Drawing, Solar Energy, and Mechatronics. Alongside my teaching responsibilities, I was actively involved in research activities focused on mechanical and control systems. I also supervised and mentored student projects, encouraging learners to develop innovative, practical, and application-oriented engineering solutions. This role helped strengthen my early academic foundation in teaching, research, communication, and student engagement.

PostDoctoral Researcher Experience

Postdoctoral Researcher

Nov 2018 - Feb 2020

[Orebro University, School of Science and Technology, Orebro, Sweden](#)

Worked as a Postdoctoral Researcher on the project "Fault Detection and Useful Life Prediction of Manufacturing Systems Using Intelligent Techniques", conducted in collaboration with industrial partners including Epiroc, Alkit Communications AB, LKAB, and Mobilaris AB. The project focused on improving the reliability, efficiency, and predictive maintenance capabilities of mining and manufacturing systems. My main contribution was the development of a model-based fault detection estimator for identifying vibration-induced faults in drill rigs. This work combined advanced control strategies, intelligent diagnostic techniques, and condition monitoring methods to support early fault detection, useful life prediction, and improved system performance in industrial environments.

Postdoctoral Researcher**Feb 2018 - Oct 2018**

Instituto Tecnológico y de Estudios Superiores de Monterrey (Tecnológico de Monterrey)

Worked as a Postdoctoral Researcher on the project "Intelligent Control of Chatter in Milling Process", conducted in collaboration with Bocar Group, a leading manufacturing company in Mexico. The project aimed to develop advanced control strategies for active suppression of chatter vibrations in milling operations. In the first phase, I proposed an active control approach using PD/PID controllers integrated with Type-2 Fuzzy Logic to attenuate chatter vibrations and improve machining stability. In the second phase, I developed a discrete-time control strategy combining Discrete Sliding Mode Control (DSMC) with Type-2 Fuzzy Systems to enhance robustness, precision, and real-time control performance. This work contributed to improved machining stability, better surface quality, and increased process reliability in industrial manufacturing applications.

Education

Postgraduate Certificate in Higher Education (PGCHE)**May 2020 - Aug 2021**

University of the West of England, Bristol, United Kingdom

Grade: Merit

PhD in Control Systems**Jan 2014 - Feb 2018**

Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV), Mexico City, Mexico

Grade: 9.7/10

Master of Technology (MSc) in Mechatronics**Jun 2007 - Jun 2009**

VIT University, Vellore, Tamil Nadu, India

Grade: 8.43/10

Bachelor of Technology in Mechanical Engineering**Jun 2001 - Jun 2005**

National Institute of Technology (NIT), Silchar, Assam, India

Grade: 1st Class

Publications

BOOK

Yu, W., & Paul, S. (2020). *Active Control of Bidirectional Structural Vibration*. Springer-Briefs in Applied Sciences and Technology, Springer International Publishing.

INTERNATIONAL JOURNALS

Paul, S. 2026. A Vibration Control Method for Chatter Mitigation in Milling Process Based on Sliding Mode Control and Reinforcement Learning. *Scientific Reports*, Springer Nature.

Paul, S., & Löfstrand, M. 2026. A Review on Condition Monitoring and Control of Industrial Drilling Systems: Fault Detection, Fuzzy Control, and Human-Induced Faults. *Frontiers in Mechanical Engineering*.

Khodadad, D. and Paul, S., 2026. Fuzzy reliability framework for optical phase unwrapping. *Journal of Optics*.

Sabahno, H., Paul, S. and Khodadad, D., 2025. Adaptive resolution in speckle displacement measurement using optimized grid-based phase correlation and statistical refinement. *Sensing and Bio-Sensing Research, ELSEVIER*, 48, p.100790.

Khodadad, D., Tayebi, B., Saremi, A. and Paul, S., 2023, October. Digital holography for temperature investigations in space and transparent media. In *Remote Sensing of Clouds and the Atmosphere XXVIII* (Vol. 12730, pp. 191-196). SPIE.

Turnbull, R., Rahmani, R., Paul, S., & Rahnejat, H. (2023). Electrotribodynamics of ball bearings in electrical machines. *Tribology International, ELSEVIER*, 108817.

Khodadad, D., Tayebi, B., Saremi, A., & Paul, S. (2023). Temperature Sensing in Space and Transparent Media: Advancements in Off-Axis Digital Holography and the Temperature Coefficient of Refractive Index. *Applied Sciences*, 13(14), 8423.

- Moradi, M., Karamimoghadam, M., Meiabadi, S., Casalino, G., Ghaleeh, M., Baby, B., Paul, S., & Khodadad, D. (2023). Mathematical modelling of fused deposition modeling (FDM) 3D printing of poly vinyl alcohol parts through statistical design of experiments approach. *Mathematics*, 11(13), 3022.
- Paul, S., Arunachalam, A., Andreasson, H., Khodadad, D., & Rubanenko, O. (2021). Fuzzy TunedPID controller for Envisioned Agricultural Manipulator, *International Journal of Automation and Computing*, Springer.
- Paul, S., & Morales-Menendez, R. (2019). Chatter mitigation in milling process using discrete time sliding mode control with type 2-fuzzy logic system. *Applied Sciences*, 9(20), 4380.
- Paul, S., Yu, W., & Li, X. (2019). Discrete-time sliding mode for building structure bidirectional active vibration control. *Transactions of the Institute of Measurement and Control*, 41(2), 433-466.
- Paul, S., & Morales-Menendez, R. (2018). Active control of chatter in milling process using intelligent PD/PID control. *IEEE Access*, 6, 72698-72713.
- Paul, S., & Jafari, R. (2018). Recent advances in intelligent-based structural health monitoring of civil structures. *Advances in Science, Technology and Engineering Systems*, 3(5), 339-353.
- Paul, S., Yu, W., & Jafari, R. (2018). A method for bidirectional active vibration control of structure using discrete-time sliding mode. *IFAC-PapersOnLine*, 51(13), 361-365.
- Paul, S., Yu, W., & Li, X. (2018). Bidirectional active control of structures with type-2 fuzzy PD and PID. *International Journal of Systems Science*, 49(4), 766-782.
- Paul, S., & Yu, W. (2018). A method for bidirectional active control of structures. *Journal of Vibration and Control*, 24(15), 3400-3417.
- Paul, S., Yu, W., & Li, X. (2016). Recent advances in bidirectional modeling and structural control. *Shock and Vibration*, 2016, 1-17.
- Paul, S., Gupta, P., Singh, M., & Singh, N. (2013). Conceptual design and development of automated drilling system. *International Journal of Scientific & Engineering Research*, 4(7).
- Paul, S. (2013). Automatic control and monitoring system for safer working environment in oil collecting station. *International Journal of Emerging Technology and Advanced Engineering*, 3(4).

MANUSCRIPTS UNDER REVIEW

- Paul, S., Löfstrand, M., & Khodadad, D. (2026). Hybrid PID-Reinforcement Learning Control for Active Vibration Suppression in Milling Processes. Springer. Under Review.
- Paul, S. (2026). Robust Vibration-Based Fault Detection for Rotary-Percussive Drilling Using IT2 T-S Fuzzy Modeling and Sliding Mode Observer. Springer. Under Review.

CONFERENCE PUBLICATIONS

- Paul, S., & Löfstrand, M. (2026). Vibration-Based RUL Prediction for Deep-Hole Drilling Using Support Vector Machines. Accepted at the 67th International Conference of Scandinavian Simulation Society (SIMS 2026), International Federation of Automatic Control (IFAC).
- Paul, S., Löfstrand, M., & Eklund, P. (2026). Interval Type-2 Fuzzy PID Control for Negative-Damping Torsional Vibrations in Rotary-Percussive Drilling. 10th International Conference on Robotics, Control and Automation (ICRA 2026), Osaka, Japan, March 28-30, 2026. IEEE Conference Proceedings.
- Paul, S., & Löfstrand, M. (2026). Vibration-Based Automatic Fault Detection for Rotary-Percussive Drilling via IT2 TS Fuzzy Modelling and Adaptive Observer. 12th International Conference on Mechatronics and Robotics Engineering (ICMRE 2026), University of Oldenburg, Oldenburg, Germany, March 2-4, 2026. IEEE Conference Proceedings.
- Eklund, P., Löfstrand, M., Paul, S. & Goodarzi, M., 2025. DSM relational structures extended with fuzzy sets of higher types. Presented at the DSM 2025 Conference - Integrating Systems Across Multiple Domains, 24-26 September, Stevens Institute of Technology, Hoboken, NJ, USA.

Paul, S., Arunachalam, A., Khodadad, D., & Rubanenko, O. (2020). Fuzzy tuned PID controller for vibration control of agricultural manipulator. In *2020 International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA)*, IEEE.

Paul, S., & Lofstrand, M. (2020). Intelligent fault detection scheme for drilling process. In *2019 7th International Conference on Control, Mechatronics and Automation (ICCMA)*, IEEE.

Jafari, R., Razvarz, S., Gegov, A., & Paul, S. (2018). Modeling and Control of Uncertain Nonlinear Systems. In *2018 International Conference on Intelligent Systems (IS)*, IEEE.

Paul, S., & Yu, W. (2017). Type-2 fuzzy PID for active control of bidirectional structures. In *2017 14th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE)*, IEEE.

Jafari, R., Paul, S., & Yu, W., A., & Paul, S. (2018). Modeling and Control of Uncertain Nonlinear Systems. In *2018 International Conference on Intelligent Systems (IS)*, IEEE.

Paul, S., & Yu, W. (2016). Intelligent techniques for bidirectional structural health monitoring. In *ICMCE '16: Proceedings of the 5th International Conference on Mechatronics and Control Engineering*, ACM Digital Library.

Paul, S., & Yu, W. (2016). Stable active vibration control of building structure subjected to bidirectional earthquake. In *2016 13th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE)*, IEEE.

Paul, S., & Yu, W. (2015). Advances in bidirectional modeling and structural control. In *2015 Resilience Week (RWS)*, IEEE.

BOOK CHAPTERS

Jafari, R., Razvarz, S., Gegov, A., & Paul, S. (2021). Modeling of uncertain nonlinear system with Z-numbers. In *Encyclopedia of Information Science and Technology* (290-314). IGI Global.

Paul, S., & Löfstrand, M. (2020). Discrete time sliding mode control of milling chatter. *Advances in Intelligent Systems and Computing*, 1121 AISC, 381-390, Springer.

Paul, S., Yu, W., & Jafari, R. (2020). Stability Analysis and Bidirectional Vibration Control of Structure. In: Babu K., Rao H., Amarnath Y. (eds) *Emerging Trends in Civil Engineering*. Lecture Notes in Civil Engineering, vol 61. Springer, Singapore.

Jafari, R., Razvarz, S., Gegov, A., Paul, S., & Keshtkar, S. (2019). Fuzzy modeling for uncertain nonlinear systems using fuzzy equations and Z-numbers. In: Lotfi A., Bouchachia H., Gegov A., Langensiepen C., McGinnity M. (eds) *Advances in Computational Intelligence Systems*. UKCI 2018. Advances in Intelligent Systems and Computing, vol 840. Springer, Cham.

Jafari, R., Razvarz, S., Gegov, A., Paul, S., & Keshtkar, S. (2019). Fuzzy Sumudu Transform Approach to Solving Fuzzy Differential Equations With Z-Numbers. In *Advanced Fuzzy Logic Approaches in Engineering Science*, (18-48). IGI Global.

Razvarz, S., Jafari, R., Gegov, A., Yu, W., & Paul, S. (2018). Neural Network Approach to Solving Fully Fuzzy Nonlinear Systems. In D. Mullins, & T. Harvey (Eds.), *Fuzzy Modeling and Control: Methods, Applications and Research*. Novel Publications.

Professional Qualification

Fellow of the Higher Education Academy (FHEA), AdvanceHE **May 2020 - Sep 2021**

[Bristol, United Kingdom](#)

Achieved the full fellowship status “FHEA”, Advanced HE UK. In recognition of attainment against the UK Professional Standards Framework for teaching and learning support in higher education.

Awards and Fundings

CONACYT PhD Full Scholarship

Jan 2014 - Feb 2018

Mexico City

Erasmus Mundus Funding (EU Initiative

May 2024 - May 2024

University of Central Florida, Orlando

Guest researcher at the Rehabilitation Engineering and Assistive Device Lab (REAL) at the Burnett School of Biomedical Sciences.

Software/Programming Competencies

Proficient in MATLAB/Simulink, with extensive experience in modeling, simulation, and control system development. I have programmed and simulated various mechanical and mechatronic systems for vibration control applications. My work includes developing and implementing control algorithms such as PID controllers, sliding mode controllers, and fuzzy logic controllers. Additionally, I have utilized MATLAB/Simulink for automatic fault detection in dynamic systems, enhancing system reliability and performance through simulation-driven insights.