



Department of Instrumentation and Control

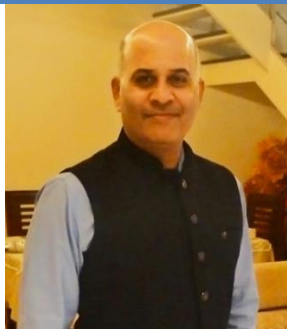
COEP-Tech University, Pune

Email: dns.instru@coeptech.ac.in, sonawanedn@gmail.com

Web: <https://www.coep.org.in/departments/instru>, www.coepembeddedlab.com

Off: 020-25507625, Cell: +919822888944

Dr. Dayaram Sonawane



Summary

Dr. Dayaram Sonawane is currently an Associate Professor of Department of Instrumentation and Control and holding an additional charge of Registrar of COEP-Tech University, Pune, India. He has over 26+ years of academic, research and administrative experience. He is leading a research group mainly working on optimization-based control, embedded optimization, and real-time embedded applications of Model Predictive Control.

Research Interest

Embedded Control and Optimization based Control. Leading the research group in Model Predictive Control (MPC), Embedded-MPC. His research also involves mathematical modeling and optimal control of Li-ion batteries and Battery Management Systems. Development of energy efficient controller for electric drives and its applicability to Electric Vehicles (EVs). Internet of Things (IoT) and Machine Learning Applications to Optimization based Control.

Experience

- Registrar (Additional Charge), COEP Technological University, Pune (April 2023 – till date)
- Head, Department of Instrumentation and Control, COEP (April 2019 – March 2023)
- Associate Professor - Department of Instrumentation & Control, COEP, (2008 - till date)
- Assistant Professor- Department of Instrumentation & Control, COEP, (2005-2008)
- Lecturer- Department of Instrumentation & Control, COEP, (1998-2005)

Professional Experience with Foreign Universities

- Visiting Exchange Professor - Department of Automatic Control, CentraleSupélec University, Paris-Saclay, France (June 2022 – July 2022)
- Visiting Associate Professor - Department of Chemical Engineering, University of Washington Seattle, USA. (May 2018 – July 2018)
- Visiting Associate Professor - Department of Chemical Engineering, University of Washington Seattle, USA. (May 2017 – July 2017)
- Postdoctoral Research Associate- Maple Lab, Department of Chemical Engineering, University of Washington Seattle, USA (with Professor Venkat Subramanian) (Sep. 2014 -Aug. 2015)
- Postdoctoral Research Associate- Maple Lab, Department of Energy, Environmental and Chemical Engineering, Washington University in St. Louis, USA (with Professor Venkat Subramanian) (Feb. 2014 – Aug. 2014).

Research Projects

- IISC Bangalore Under DRDO Industry Academia- Centre of Excellence (DIA-RCoE), IISC Bengaluru, Development of Algorithm & Testing Tools for Directed Energy Systems on Long Range Agile Targets, **(Ongoing, July 2024- June 2029)**
- Vehicle Research Development Establishment (VRDE)-DRDO through CARS Grant, Design and development of dynamic non-linear closed loop control of LMV, its CARSim Validation and Embedded Co-Simulation, **(Completed, May-2022- Oct. 2022)**

- Numerical optimization in reconfigurable hardware to extend the use of Model Predictive Control for real-time applications, (**Completed, Dec. 2019 - 2022**) with PhD student, MHRD, Govt. of India.
- Vehicle Research Development Establishment (VRDE)-DRDO through CARS Grant, Development of Vehicle Dynamics Plant Model and Embedded Co-Simulation with ARM Platform, (**Completed, 2020-21**)
- Development of Sensor and Data Acquisition Remote Triggered Virtual Lab, Virtual Lab an initiative of Govt. of India through ICT Scheme, (**Completed, 2011-2014**), MHRD, Govt. of India
- Development of FPGA-Embedded System Virtual Lab, Virtual Lab Project, an initiative of Govt. of India through ICT Scheme, (**Completed, 2010-2013**), MHRD, Govt. of India
- Sub-cutaneous Vein Detection System for Drug Delivery Assistance, UGC's Major Research Project Scheme (UGC-MRP) (**Completed, 2011-2014**), UGC, Govt. of India
- VLSI Implementation of DSP for Model Predictive Controller, AICTE's Research Project Scheme (AICTE-RPS) (**Completed, 2008-2010**), AICTE, Govt. of India

Industry Sponsored Projects/Consultancy

- Hella Automotive Pvt. Ltd. Pune, "Estimation of Intelligent Charging Profiles for Li-Ion Battery", (**Ongoing, 2023-2024**)
- SBEM Pvt. Ltd. Pune, "Development of Ultrasonic Flow Meter based on 32-bit Wi-fi enabled Microcontroller", (**Completed, 2023-24**)
- Kohler Power India Pvt. Ltd, "Low Flow Control with proportional Valve", (**Completed, 2023-24**).
- Energy Optimization of Battery-Operated Emergency Light System for Railway Coach. Intra Electronics, Pune, the product was RDSO approved and later commercialized. (**Completed, 2010-1011**)
- Microcontroller base development of flow indicator for UV based water disinfectant system, UV Microsystem, Pune. (**Completed, 2009-2010**)

Publications

- Journal Papers – 15+
- Conference Papers – 40+
- Books – 01

Patents

- D. N. Sonawane, M. T. Lawder, M. Pathak and Venkat R. Subramanian, "Robust fail-safe iteration free approach for solving Index-1 DAEs arising from battery models", **US Patent** application #62/194,678. (USA Patent).
(Link: <https://www.google.com/patents/WO2017015396A1?cl=en#backward-citations>)
- Dr Jayant Pawar, Dr D N Sonawane, Dr Kiran Diwate, Dr Geeta Karande, Mr. Swapnil Awachkar, Dr D K Agrawal, "Disinfecting and Sterilizing Chamber", **Indian Patent**, # Application No: 336097-001, Date: 20/12/2020 (Granted) Awarded On: 22/11/2021
- Dr Jayant Pawar, Dr D N Sonawane, Dr Kiran Diwate, Dr Geeta Karande, Mr. Swapnil Awachkar, Dr D K Agrawal, "Disinfecting and Sterilizing Tray", **Indian Patent**, Application No: 336098-001, Date: 20/12/2020 (Granted) Awarded On: 10/11/2021

Awards and Accolades

- 2020 Duo-India Professor Fellowship – Awarded Duo-India Fellowship (3000 Euros) faculty exchange with Prof. Sorin Olaru, Professor, CentraleSupélec University Paris-Saclay, France.
- Visiting Associate Professor at Department of Chemical Engineering, University of Washington, Seattle, USA

- Recipient of **Uniken Innovation award** in 2012, (Institute Level)
- **Best Paper Award**, CCPE2012, Bangalore, (International Conference)
- **National Level Award**, Auma India Annual Challenge 2010, First Prize
- **Certified trainer** of Microchip Corporation, USA
- **Reviewer:** IEEE Transaction on Computers,
- **Reviewer:** Inderscience Journal of Circuits and Architecture Design
- **Chairman**, IET Pune LN for the year 2020

Education

- Bachelor of Engineering - Instrumentation and Control, SGGS, Nanded, India (1997)
- Master of Engineering – Electronics and Telecommunication, SPPU, Pune, India (2000)
- PhD – Hardware Acceleration of Model Predictive Control, SPPU, Pune, India (2012)
- Postdoc- Mathematical Modeling and Design of Battery Management Systems for Li-Ion battery, UW, Seattle, USA (2014-2015)
- Postdoc – Development of Li-Ion Battery Management Systems, Washington University in St. Louis, MO, USA