

Swapnil Mahadev Dhobale

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Profile Summary

Serving as an Assistant Professor in the Department of Mechanical Engineering with a focus on teaching, research, and academic development. My areas of expertise include nonlinear dynamics, control systems, vibrations, and numerical methods. Actively seeking collaborations in interdisciplinary research to broaden academic and research impact.

Education

IEST, Shibpur

Ph.D. in Mechanical Engineering

2020–Present

Research in nonlinear dynamics and control.

IEST, Shibpur

M.Tech in Mechanical Engineering (Machine Design)

2020

CGPA: 8.65/10

IEST, Shibpur

B.Tech in Mechanical Engineering

2019

CGPA: 7.25/10

V. G. Vaze College, Mumbai

HSC

2015

Percentage: 73.08%

Saraswati Vidyalaya, Navi Mumbai

SSC

2013

Percentage: 93.25%

PhD Research Experience

Indian Institute of Engineering Science and Technology, Shibpur

PhD Researcher

2020 – Present

Research Summary:

- Investigated the performance of generalized fractional-order nonlinear resonant control for active vibration control in time-delayed systems.
- Optimized the control parameters based on various techniques.
- Proposed a novel adaptation equation to deal with uncertainties in a vibrating system.
- Designed a resonant controller with parametric feedback for active vibration control.
- Experimental verification of the proposed active vibration controllers on a cantilever beam.
- Designed a novel control technique for generating chaos within a selected frequency range in a mechanical system and verified its performance experimentally.

- Utilized sliding mode control to achieve desired periodic motion in mechanical systems and verified its performance with the experiments on a pendulum.
- Developed a generalized framework for designing limit cycle oscillators with specified limit cycle shapes.

Advisor: Prof. Shyamal Chatterjee, Professor and Ex-Head, Department of Mechanical Engineering, IEST Shibpur

Research Interest

Nonlinear Vibrations and Control

Nonlinear Dynamics

Robotics

Publications

First-Author Publications.....

[1]: **Dhobale, S.M.** and Chatterjee, S., 2023. Optimal nonlinear resonant controllers of fractional order for active vibration control. *Mechanical Systems and Signal Processing*, 182, p.109580. (Impact Factor: 7.9, Q1)

[2]: **Dhobale, S.M.** and Chatterjee, S., 2024. Efficacy of a class of resonant nonlinear controllers of fractional-order for adaptive vibration control. *Control Engineering Practice*, 143, p.105788. (Impact Factor: 5.4, Q1)

[3]: **Dhobale, S.M.** and Chatterjee, S., 2024. A novel resonant parametric feedback controller (RPFC) for suppressing nonlinear resonances and chaos in a cantilever beam. *Nonlinear Dynamics*, 112(2), pp.1039-1067. (Impact Factor: 5.2, Q1)

[4]: **Dhobale, S.M.** and Chatterjee, S., 2024. Synthesis of a hybrid control algorithm for chaotifying mechanical systems. *Chaos, Solitons & Fractals*, 189, p.115670. (Impact Factor: 5.3, Q1)

[5]: **Dhobale, S.M.** and Chatterjee, S., 2025. An Improved Model-free Adaptive Sliding Mode Controller for Generating Periodic Motions in Mechanical Systems. *Communications in Nonlinear Sciences and Numerical Simulations*, (Impact Factor: 3.4, Q1)

Co-Author Publications.....

[1]: Bhosale, S., Ganguly, A., Mondal, P. and **Dhobale, S.M.**, 2023. Thermal Model Development and Performance Optimization of a Solar-assisted Absorption-based Cold Storage Using Genetic Algorithm. *NanoWorld Journal*, 9(S1), pp.S255-S259.

Teaching Experience

Fr. Conceicao Rodrigues College of Engineering

Assistant Professor

July 2025 – Present

Software Skills

MATLAB: Advanced

Extensive experience in modeling and simulation

SIMULINK: Advanced

Control system design and analysis

ANSYS: Basic

Finite Element Analysis (FEA)

Languages Known

- English (Fluent)
- Hindi (Fluent)
- Marathi (Native)
- Bengali (Spoken, Basic Understanding)