

# Shail Jadav

Indian Institute of Technology Gandhinagar  
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<https://shailjadav.github.io/>

## Education

**PhD Candidate in Mechanical Engineering** July-2018 to Dec-2023  
Indian Institute of Technology Gandhinagar  
Thesis: "*Human-Learning-Inspired Control for Robotic Manipulators*"  
Adviser: Prof. Harish PM

**Bachelors in Biomedical Engineering** July 2013- April 2017  
Gujarat Technological University  
Second rank in college and third rank in university

## Professional Experience

**Visiting Research Scholar** May 2023 -October 2023  
Technical University of Vienna (TU Wien)  
Project: *Shared Autonomy for Human Robot Interaction*  
Adviser: Prof. Dongheui Lee & Prof. Christian Ott

**Visiting Research Scholar** May 2019 -July 2019  
The University of Texas at Austin  
Project: *Development of ankle cuff for gait trainer robot*  
Adviser: Prof. James Sulzer

**Project associate** October 2017 -June 2018  
Indian Institute of Technology Gandhinagar  
*Developed a device [PDEYE] to detect early onset of Parkinson's disease based on pupillary light reflex& conducted clinical study for the device*  
Adviser: Prof. Harish PM & Dr. Vrantang Kumar

**Project assistant** July 2017-October 2017  
Indian Institute of Technology Gandhinagar  
*Designed a device [PDEYE] to detect early onset of Parkinson's disease based on pupillary light reflex*  
Adviser: Prof. Harish PM & Dr. Vrantang Kumar

**Summer Intern** June 2017-July 2017  
Indian Institute of Technology Gandhinagar  
*Developed a remote control high-frequency vibration stimulation belt for rest tremor suppression in Parkinson's disease*  
Adviser: Prof. Harish PM & Dr. Vrantang Kumar

## Biomedical Engineer

April 2017-June 2017

AIMS Hospital, Ahmedabad

*Leader in the technical support during surgeries and implementation of the new medical equipment.*

*Quality assurance and quality control of medical devices*

## Teaching Experience

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### Graduate Teaching Fellow [Mechatronics]

August 2022 – December 2023

Indian Institute of Technology Gandhinagar

Taught undergraduate course on mechatronics along with Prof. Madhu Vadali

### Graduate Teaching Fellow [Control Theory]

January 2022 – April 2022

Indian Institute of Technology Gandhinagar

Taught undergraduate course on control theory along with Prof. Madhu Vadali

### Teaching Assistant

ME LAB II: Enabled students to do “learning-by-doing”

Writing: Enabled students for scientific writing

## Grants

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### Overseas Research Fellowship

May 2023 – October 2023

Indian Institute of Technology Gandhinagar

*Shared Autonomy for Human Robot Interaction*

### NIDHI PRAYAS grant for product development

July 2022 - December 2023

Department of Science and Technology (Govt. Of India)

Development of analog adaptive motor driver for robots

### Student Travel Grant | SPARC

May 2019 – July 2019

Department of Science and Technology (Govt. Of India)

Study of Locomotor Adaptation Using a Single degree of freedom Bilateral Gait Trainer

## Publications

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|------|---|---|--|
| [J1] | Sujay Kadam, Shail Jadav, Anadi Mehta and Harish PM | A Model-based Feedforward and Iterative Learning Controller Exhibiting Features of Human Motor Learning | IEEE Transactions on Cognitive and Developmental Systems<br>(Conditionally Accepted with minor revision) |
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[J2]	Shail Jadav, Sujay Kadam, and Harish PM	Convergence Analysis and Experimental Validation of a Trial-by-trial Learning Controller with Features of Human Motor Learning for Robotic Manipulators	IEEE Transactions on Control System Technology (Under review)
[J3]	Shail Jadav and Harish PM	Configuration and Force-field Aware Variable Impedance Control with Faster Re-learning	Journal of Intelligent & Robotic Systems
[C1]	Shail Jadav, Shubhankar Riswadkar, Sujay Kadam, and Harish PM	Variable Impedance Learning Control with Faster Re-learning and Reduced Initial Errors in Re-perturbation for Robots Operating in Divergent Force Fields	ACM Advances In Robotics 2023
[C2]	Shail Jadav, Johannes Heidersberger, Christian Ott, and Dongheui Lee	Shared Autonomy via Variable Impedance Control and Virtual Potential Field for Encoding Human Demonstrations	IEEE International Conference on Robotics and Automation 2024 (Accepted)
[J4]	Shail Jadav and Harish PM	Utilization of Manipulator Redundancy for Torque Reduction During Force Interaction	ASME Letters in Dynamic Systems and Control
[C3]	Suyash Patidar, Shail Jadav, and Harish PM	Redundancy in Planar Robotic Manipulator: A Comparison of Redundancy Configurations for Force Production Tasks	IEEE Indian Control Conference 23
[J5]	Shail Jadav, Karthik Karvaje, Sujay Kadam, Vineet Vashista, James Sulzer, Ashish Deshpande, and Harish PM	Kinematic Analysis and Validation of a Customizable Single Degree-of-freedom Gait Trainer Device	ASME Journal of Medical Devices (Accepted)
[J6]	Shah Vrutang, Shail Jadav, Sachin Goyal, and Harish PM	A Machine-Learning-Based Method to Detect Degradation of Motor Control Stability with Implications to Diagnosis of Presymptomatic Parkinson's Disease: A Simulation Study	MDPI Applied Sciences
[C4]	Shubhankar Riswadkar, Shail Jadav, and Harish PM	A Novel Approach for Combining Feedback and Feedforward Control in DC Motor Control: A Smooth Switching Strategy for Time-Varying Systems with Noisy Feedback	ACM Advances In Robotics 2023

## Reviewer Service

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IEEE Transaction on Robotics  
IEEE International Conference on Robotics and Automation (ICRA)  
ACM Advances in Robotics  
IEEE International Conference on Rehabilitation Robotics

## Invited talks

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[T1] March 2023	Advances in motion control and entrepreneurship	NIT Sikkim
[T2] March 2023	Advances in motion control	PDEU

## Awards

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[A1] 2023	Winner Regional Finale of Boeing BUILD
[A2] 2017	Runner-up at Google India Hackathon

## Relevant Course Work

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Human Robot Interaction	Digital Control Systems
Introduction to Robotics	Nonlinear Control
Modern Control Theory	Fundamentals of Neuroscience
Control Theory	Classics in Brain Science

## Hobbies

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Tinkering with Electronics & Embedded System | Musical Instruments | Cooking | Relaxing in Nature