Shail Jadav

Vienna, Austria shail.jadav[at]tuwien.ac.at shailjadav.github.io

Post Doctoral Researcher
Autonomous Systems Lab, Institut für Computertechnik
Technische Universität Wien

Education

Indian Institute of Technology Gandhinagar *PhD in Mechanical Engineering* *July 2018 – December 2023*
- Thesis: *Human-Inspired Learning Controllers and Motion Planners for Robotic Manipulators*
- Adviser: Prof. Harish Palanthandalam-Madapusi
- **GOLD MEDAL FOR OUTSTANDING INNOVATION**

Gujarat Technological University *Bachelor's in Biomedical Engineering* *July 2013 – April 2017*
- Government Engineering College, Gandhinagar
- Thesis: *Human Gait Analysis*
- Second Rank in College

Professional Experience

Post Doctoral Researcher *Technische Universität Wien* Vienna, AT *July 2024 – Present*
- Adviser: Prof. Dongheui Lee

Visiting Research Scholar *Technische Universität Wien* Vienna, AT *May 2023 – October 2023*
- Adviser: Prof. Dongheui Lee & Prof. Christian Ott
- Project: Shared Autonomy for Human-Robot Interaction

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

Project Associate *IIT Gandhinagar* Gandhinagar, IND *October 2017 – June 2018*
- Adviser: Prof. Harish PM & Dr. Vruntang Shah
- Project: Early diagnosis of Parkinson's Disease

Project Assistant *IIT Gandhinagar* Gandhinagar, IND *July 2017 – September 2017*
- Adviser: Prof. Harish PM & Dr. Vruntang Shah
- Project: Early diagnosis of Parkinson's Disease

Biomedical Engineer *AIMS Hospital* Ahmedabad, IND *April 2017 – June 2017*
- Quality assurance and quality control of medical devices
- Technical support during surgeries and implementation of the new medical equipment

Teaching Experience

Graduate Teaching Fellow [Mechatronics] *IIT Gandhinagar* *August 2022 – December 2022*
- Taught undergraduate course on mechatronics along with Prof. Madhu Vadali
- Encouraged students to embrace a hands-on learning approach and provided guidance to help them stay on the right path when needed.

Graduate Teaching Fellow [Control Theory] *IIT Gandhinagar* *January 2022 – April 2022*

- Taught undergraduate course on control theory along with Prof. Madhu Vadali
- Motivated students to value mathematical precision in control system design through theoretical and practical examples.

Teaching Assistant [ME LAB II] *IIT Gandhinagar* *January 2020 – March 2020*

- Co-taught and co-designed a hands-on lab course with Prof. Harish PM, delivering one of the most challenging and popular courses for mechanical undergraduates. Guided students to tackle technical problems within a week, build functional prototypes from scratch, and implement control systems.
- Videos: Balancing a Ball On a Plate One-degree-of-freedom four-legged walker XY Plotter

Teaching Assistant [UG writing] *IIT Gandhinagar* *January 2021 – April 2021*

- Instructed students in scientific writing, emphasizing how to construct arguments, support claims with evidence, and structure their articles effectively.

Grants

Overseas Research Fellowship (≈ INR 650000) *IIT Gandhinagar* *May 2023 – October 2023*

- Project: *Shared Autonomy for Human-Robot Interaction*
- Outcome: Paper in ICRA 2024

NIDHI PRAYAS (≈ INR 700000) *Department of Science and Technology (Govt. Of India)* *July 2022 – December 2023*

- Project: *Development of analog adaptive motor driver for robots*
- Outcome: Motor drivers in commercialization phase

Student Travel Grant SPARC (≈ INR 400000) *Department of Science and Technology (Govt. Of India)* *May 2019 – July 2019*

- Project: *Study of Locomotor Adaptation Using a Single degree o freedom Gait Trainer*
- Outcome: Journal paper

IEEE RAS Student Travel Grant (≈ USD 2500) *IEEE Robotics & Automation Society* *May 2024*

- *To attend the best robotics conference ICRA in Japan*

Awards

Gold Medal for Outstanding Innovation *IIT Gandhinagar* *2024*

- *Among all graduating students 2024*

Regional Finalist Winner of Boeing University Innovation Leadership Development (BUILD) *Boeing* *2023*

- Project: *Development of analog adaptive motor driver for robots*

Runner-up at Google India Hackathon *Google India* *2017*

- Project: *Internet-Based Health Monitoring for Cardiac Patients*

Invited Talks

Advances in motion control *NIT Sikkim* *March 2023*

Advances in motion control and robotics *Pandit Deendayal Energy University* *March 2023*

Publications

[1] S. Jadav, J. Heidersberger, C. Ott, and D. Lee, "Shared autonomy via variable impedance control and virtual potential fields for encoding human demonstrations*," in *2024 IEEE International Conference on Robotics and Automation (ICRA)*, 2024, pp. 15 151–15 157. DOI: 10.1109/icra57147.2024.10610761.

[2] S. Jadav, K. S. Karvaje, S. D. Kadam, *et al.*, "Kinematic performance of a customizable single degree-of-freedom gait trainer for cost-effective therapy aimed at neuromuscular impairments," *Journal of Medical Devices*, vol. 18, no. 1, p. 011 003, 2024. DOI: 10.1115/1.4065120.

[3] S. Jadav and H. J. Palanthandalam-Madapusi, "Configuration and force-field aware variable impedance control with faster re-learning," *Journal of Intelligent & Robotic Systems*, vol. 110, no. 1, p. 3, 2024. DOI: 10.1007/s10846-023-02022-x.

[4] S. Jadav and H. J. Palanthandalam-Madapusi, "Utilization of manipulator redundancy for torque reduction during force interaction," *ASME Letters in Dynamic Systems and Control*, vol. 4, no. 2, p. 021 005, 2024. DOI: 10.1115/1.4064654.

[5] S. V. Jadav, S. Riswadkar, S. D. Kadam, and H. Palanthandalam-Madapusi, "Variable impedance learning control with faster re-learning and reduced initial errors in re-perturbation for robots operating in divergent force fields," in *Proceedings of the 2023 6th International Conference on Advances in Robotics*, 2023, pp. 1–7. DOI: 10.1145/3610419.3610423.

[6] S. Patidar, S. Jadav, and H. J. Palanthandalam-Madapusi, "Redundancy in planar robotic manipulator: A comparison of redundancy configurations for force production tasks," in *2023 Ninth Indian Control Conference (ICC)*, IEEE, 2023, pp. 269–274. DOI: 10.1109/icc61519.2023.10442270.

[7] S. Riswadkar, S. V. Jadav, and H. Palanthandalam-Madapusi, "A novel approach for combining feedback and feedforward control in dc motor control: A smooth switching strategy for time-varying systems with noisy feedback," in *Proceedings of the 2023 6th International Conference on Advances in Robotics*, 2023, pp. 1–7. DOI: 10.1145/3610419.3610486.

[8] V. V. Shah, S. Jadav, S. Goyal, and H. J. Palanthandalam-Madapusi, "A machine-learning-based method to detect degradation of motor control stability with implications to diagnosis of presymptomatic parkinson's disease: A simulation study," *Applied Sciences*, vol. 13, no. 17, p. 9502, 2023. DOI: https://doi.org/10.3390/app13179502.

Reviewer Service

IEEE Transaction on Robotics

IEEE International Conference on Robotics and Automation (ICRA)

IEEE International Conference on Rehabilitation Robotics

ACM Advances in Robotics