

Shreeram Murali

☎ +358 45 272 2737 ✉ shreeram.murali@outlook.com 🌐 github.com/shreeram-murali

EDUCATION

Master of Science (M.Sc.), Electrical Engineering and Computer Science

Aalto University

Espoo, Finland

Aug. 2023 – exp. 2025

- **Major:** Control, Robotics, and Autonomous systems, **Minor:** Computer Science
- **GPA:** 4.62/5.0
- Received the Aalto University Category A Scholarship
- Received the Dean's Incentive Scholarship

Bachelor of Engineering (B.Eng.), Mechanical Engineering

Ramaiah Institute of Technology

Bangalore, India

Aug. 2017 – July 2021

- **GPA:** 9.37/10.0, Graduated First Class (1st) with Distinction
- Received the Best Achiever Award (outgoing class of 2021)

EXPERIENCE

Research Assistant

Aalto University

Espoo, Finland

June 2024 – present

Cyber Physical Systems Group (full-time for 3 months 6–8/2024; part-time from 9/24 onwards)

- Trained a Koopman operator to learn a nonlinear reward transformation in reinforcement learning to ensure robustness and a higher level of safety, for example, in autonomous driving applications such as lane following.
- **Skills:** Python, Slurm, High-performance Computing

Sensor Informatics and Medical Technology Group (part-time)

Nov. 2023 – May 2024

- Simulated the dynamics and control of a rotary inverted pendulum using JAX.
- Implemented basic controllers such as LQR, PID, energy-control, and MPC for upright balancing and swing-up control.
- **Skills:** Python, JAX, JIT-compilation, MATLAB, Simulink

Junior Research Fellow

Indian Institute of Science

Bangalore, India

Aug. 2021 – Jul. 2023

Data, Control, and Autonomous Systems (DACAS) Lab

- Implemented control strategies on multiple ROS and ROS2 nodes using Python and C++ to run at 30–60 Hz.
- Implemented a computationally lightweight vision-based feature tracking and obstacle avoidance method using fiducial markers and colour thresholding with computation less than 0.002 seconds for navigating warehouse robots.
- Collected experimental data of quad-rotor flight over several randomised trajectories for system identification.
- Contributions led to multiple publications in nonlinear control.
- **Skills:** Python, ROS, MATLAB, C++, Jetson, Numba/JIT, Pandas, OpenCV, Threading

Software Engineer Intern (IoT)

Tata Consumer Products

Bangalore, India

Feb. 2021 – Jul. 2021

- Wrote python scripts to run automatically on Raspberry-Pi based IoT devices to read café parameters and push to a time-series database.
- Wrote unit-tests for the functions to ensure that they provide sensible metrics.
- **Skills:** Python, Unit-testing, InfluxDB, AWS, Grafana, Raspberry Pi (SoC)

OTHER EXPERIENCES

Teaching Assistant (Course: Basics of Sensor Fusion)

Aalto University

Espoo, Finland

Sep. 2024 – present

- The course covers state-space representations, nonlinear optimisation methods, estimation, and filtering algorithms. I implemented, tested, and validated submissions where calibration, search, and filtering algorithms enabled a rover to localise itself based on images and IMUs.

PROJECTS

- Olympic Medals Predictor** | *Python, sklearn* [code](#) (2024)
- Forecasted the number of medals a country would win based on socioeconomic indicators. Implemented a Random Forest regressor model that yielded R^2 of 0.9; this was benchmarked against baseline linear regression.
- Balancing a Pole with Spot** | *Python, ROS2* [demo video](#) (2024)
- Sensor integrations, PID controllers for balancing a pole, and data collection for reinforcement learning — with Boston Dynamics' Spot Robot.
- Multi-Agent Reinforcement Learning** | *Python* [code](#) (2024)
- A proof-of-concept implementation of a fully decentralised multi-agent reinforcement learning algorithm with networked agents. Motivated by [this paper](#).
- Extended Kalman Filter GNSS** | *Python* [code](#), [report](#) (2024)
- Implemented Kalman Filter based algorithms to estimate a receiver's position based on pseudorange estimates.
- Shawshank Text Adventure** | *Scala* [code](#) (2023)
- A text based adventure game that incorporates multiple aspects of object-oriented programming.
- Sensor Fusion for an Autonomous Ground Vehicle** | *Python* [code](#), [report](#) (2023)
- Calibrated the IMUs, cameras, and the motor controller of an autonomous ground vehicle to enable localisation and estimation.
- Edhitha UAS** [technical paper](#) (2019 – 2021)
- Led a competitive student group to develop an autonomous UAV capable of imagery, air delivery, and obstacle avoidance — complete with real-time data acquisition and transmission of GNSS data, imagery, and interoperability.

PUBLICATIONS

- [J1] J. Keshavan, S. Belgaonkar and **S. Murali**, “Adaptive Control of a Constrained First Order Sliding Mode for Visual Formation Convergence Applications,” in IEEE Access, vol. 11, pp. 112263-112275, 2023 → [DOI link](#)
- [C1] S. Singhal, J. Keshavan, and **S. Murali**, “Constant Optical Flow Divergence based Robust Adaptive Control Strategy for Autonomous Vertical Landing of Quadrotors,” AIAA SCITECH 2023 Forum, Jan. 2023 → [DOI link](#)

SKILLS

Programming: Python, Scala, R, MATLAB, Simulink, C++, Git

Systems: ROS, ROS2, EcoStruxture Automation Expert, SOCs (Pi, Arduino, Jetson), ArduPilot, OpenCV, Gazebo, GNSS

Languages: English (bilingual native), Finnish (A1.1)