TANAY RAGHUNANDAN SRINIVASA

+91 9663083290 | tanay.srinivasa@plaksha.edu.in | tanayrs.com | GitHub

Education

B.Tech in Robotics & Autonomous Systems - Plaksha University, Mohali — **CGPA**: 9.57 — 2026
12th (Karnataka State Board) - City Composite PU College, Bengaluru — **Percentage**: 76% — 2022
10th (CISCE) - National Academy For Learning, Bengaluru — **Percentage**: 90% — 2020

Work Experience

Research Intern, UR Rao Satellite Center, ISRO — May 2025 - Jul 2025
- Developed Physics Informed Neural Networks to solve Infinite Horizon **Optimal Control Problems** for aerospace applications.
- Leveraged the **Extreme Theory of Functional Connections** to solve the Inverted Pendulum and Spacecraft Detumbling Optimal Control Problems.
- Derived the Hamilton-Jacobi-Bellman Equation, the necessary and sufficient condition for optimality, for a **constrained action space**.

Student Tutor, Plaksha University — Feb 2025 - May 2025
- Conducted tutorials and computational labs for RO2001: System Dynamics and Control, covering **system modeling** and **performance analysis**.
- Designed and assisted students with the course balancing robot project, focusing on **motor characterization**, **sensor filtering**, and PID control.

Summer Research Intern, Robert Bosch Center for Cyber-Physical Systems, IISc — May 2024 - Aug 2024
- Designed and Tuned a Linear Controller with a **Gain Scheduler** to Balance **BiSteering Two Wheeled Robot**, achieving balance for 76s.
- Researched and Measured Loaded and Unloaded **Motor Deadband** and Compensation techniques.
- Measured and Compared Settling Time and Overshoot of the **Bosch Sensor Fusion Algorithm** and a **Kalman Filter**.
- Implemented and debugged techniques to reduce **backlash** in the steering drivetrain, improving control precision.

Research Intern, Prof. Rudra Pratap and Prof. Andy Ruina, Plaksha University — May 2023 - Jan 2024
- Collaborated with Prof. Pratap and Prof. Ruina on solutions for their **"Introduction to Mechanics for Engineers"** textbook.
- Created 144 Solutions to 3 Chapters: 'Vectors: Position, Force, and Moment', 'Units and Estimation', 'Trusses and Frames.'
- Developed a **Truss Analysis Program** on MATLAB to Visualize Effects of Forces on Two Dimensional Trusses.

Projects

Degradation Aware Optimal Battery Cycling for Smart Grids | *Dr. Vivek Deulkar* — Aug 2025 - Present
- Developed RL agents to optimally cycle heterogeneous battery banks to fulfill demand-supply mismatches in **renewable energy generation**.
- Designed an **off-policy function-approximation** kernel inspired by the Extreme Learning Machine, outperforming handcrafted features by 2x.
- Researched and Integrated rainflow-based lithium ion depth-of-discharge **battery degradation** models to minimize operational costs.

SegwayRL | *Dr. Sandeep Manjanna* — Jan 2025 - May 2025
- Designed and trained **PPO** and **DQN** agents to balance a segway robot, with training in both simulation and hardware.
- Developed a segway training and deployment environment using **OpenAI Gymnasium**, designed for 10ms sensing-actuation loop in hardware.
- Designed a **state-action reward function**, to penalize states far away from equilibrium, while penalizing large control efforts for small errors.

Low Altitude Remote Sensing (LARS) UAV for Crop Health Monitoring | *Prof. Sunita Chauhan* — Jan 2024 - May 2025
- Developed a **ROS based communication** protocol to interface UAVs with ground robots to enable real-time autonomous crop monitoring.
- Developed a lightweight convolutional neural network based on MobileNet-v4 meant to be deployed on **constrained edge devices**.
- Calculated **Ground Sampling Distance (GSD)** at varying altitudes for UAVs, benchmarking imaging capabilities for precise crop health monitoring.

Segway Path Follower | *Prof. Shashank Tamaskar* — Jan 2025 - Apr 2025
- Developed an **LQR-based waypoint controller** to track 2-D trajectories while maintaining balance for a simulated differential-drive Segway.
- Designed a hybrid PID control block, combining a PID cascade for position control with a heading controller for pose control as an LQR baseline.

Google American Sign Language Fingerspelling Recognition Challenge | *Prof. Anupam Sobti* — Aug 2024 - Dec 2024
- Achieved a CTC loss of 0.728, ranking **54th out of 1,300+ teams** in the global American Sign Language fingerspelling recognition competition.
- Designed and implemented a **Hybrid Transformer Architecture** combining Squeezeformer and Conformer blocks to improve accuracy.
- Designed and implemented a **Convolutional Squeezeformer** with Squeeze-and-Excitation blocks, to balance computational load and accuracy.

Skills

Programming Languages: Python, MATLAB, C/C++, ROS2, Bash, LaTeX.
Design and Manufacturing: Fusion 360, RD Works.
Micro-controllers: Raspberry Pi 3B+/4B/5, ESP-32, Arduino Uno, Arduino Nano, Teensy 4.1, STM32F103RB.

Publications

Nanda, T.R., Shukla, A., Srinivasa, T.R., Bhargava, J., Chauhan, S. (2025). *Advancing Real-Time Crop Disease Detection on Edge Computing Devices Using Lightweight Convolutional Neural Networks*. In: Arai, K. (eds) Intelligent Systems and Applications. IntelliSys 2025. Lecture Notes in Networks and Systems, vol 1567. Springer, Cham. https://doi.org/10.1007/978-3-032-00071-2_33 .

T. R. Srinivasa and S. Kumar, *Solving Infinite-Horizon Optimal Control Problems using the Extreme Theory of Functional Connections*, in Proc. Indian Control Conf. (ICC-11), accepted Sept. 18, 2025. https://doi.org/10.48550/arXiv.2510.27187

Relevant Coursework

RO3003: Control Autonomy, Planning and Navigation | *Prof. Shashank Tamaskar* Grade: A
RO3002: Reinforcement Learning Fundamentals | *Prof. Sandeep Manjanna* Grade: A
RO2102: Dynamics and Simulation | *Prof. Andy Ruina* Grade: A
CP3001: Embedded Systems | *Prof. Srikant Srinivasan* Grade: A
AI3001: Deep Learning | *Prof. Anupam Sobti* Grade: A

Positions of Responsibility

Career Development Cell Representative, Plaksha University Jun 2024 - Present
Assisted students with placement cycle enrollment and answered queries during the third-year placement cycle.

Mechanical Workshop Coorndinator, Robotics Lab, Plaksha University Aug 2024 - Jan 2025
Developed the floor plan, designed the workbench, procured tools, and set-up the mechanical workshop.

Achievements

Dean's List Nov 2025
Awarded for outstanding academic performance during the Academic Year 2024-2025.

SP Dutt Award for Innovation and Impact 2025 Apr 2025
Second Position for Project Titled "Low Altitude Remote Sensing (LARS) UAV for Crop Health Monitoring."