# Shriman Raghav Srinivasan

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## Education

**Northeastern University** Boston, MA
*Master of Science in Robotics; GPA: 3.78* *September 2024 – August 2026*
- Relevant Courses: Legged Robots, Reinforcement Learning, Control Systems Engineering, Mobile Robotics

**SRM Institute of Science & Technology (SRMIST)** Chennai, India
*Bachelor of Technology in Mechatronics Engineering; GPA: 3.81* *June 2018 – May 2022*
- Relevant Courses: Fundamentals of Robotics, Linear & Digital Control Systems, Automation & Intelligent Systems

## Experience

**Manufacturing Equipment Engineer Intern** April 2025 – December 2025
*Tesla Inc.* *Fremont, CA*
- Deployed autonomous mobile robots with SLAM, LiDAR, and 3D perception achieving $2.04M projected savings, developing expertise in real-time localization critical for humanoid locomotion
- Owned DFMEA-driven reliability improvements achieving 35% downtime reduction through PID tuning, dynamic modeling, and vibration mitigation—directly applicable to bipedal balance control
- Programmed penalty-optimized Theta* path planning reducing routing complexity by 83% for 47 vehicles, demonstrating motion planning skills transferable to humanoid navigation and obstacle avoidance
- Developed multi-camera pedestrian safety system using YOLOv8 and Depth Anything V2, achieving 30 FPS inference with ¡1s latency—perception experience applicable to humanoid environmental awareness

**Robotics Engineer – Projects** July 2022 – August 2024
*Hero MotoCorp Ltd* *Neemrana & Tirupati, India*
- Designed Model Predictive Control (MPC)-based path planning algorithm achieving 33.4% reduction in operational delays with 25-step prediction horizon—methodology
- Implemented PID-based control systems for robotic manipulators, improving motion stability by 12% and reducing positioning errors to ¡ 0.5mm, gaining foundational control experience for legged systems
- Developed precision trajectory planning in MATLAB/Simulink reducing material wastage by 11.9% and saving $476,000 annually

## Projects

**Bipedal Walker: Gait Design and Nonlinear Feedback Control** January 2026 – April 2026
- Designed stable periodic walking gaits using 6th-order Bezier polynomial parameterization of virtual constraints, optimizing for energy efficiency achieving 15% lower cost of transport via Poincaré map analysis
- Implemented nonlinear closed-loop feedback controller using zero dynamics and input-output linearization, achieving exponentially stable walking with 0.98 Lyapunov decay rate across 500+ simulation steps
- Modeled 5-DOF bipedal hybrid dynamics using Lagrangian mechanics, implementing swing phase ODEs (10 states) and discrete impact reset maps achieving less than 2% gait cycle deviation in MATLAB simulation

**3D Reconstruction and State Estimation using RTAB SLAM** October 2024 – November 2024
- Integrated RTAB-Map SLAM with stereo camera and IMU data via Kalman filtering, achieving 0.8cm mean accuracy for robotic state estimation—essential for humanoid localization and balance
- Developed drift-free mapping using Bayesian loop closure and GTSAM optimization, reducing cumulative drift by 12% in ROS2 for robust indoor humanoid navigation

**GPS & IMU Sensor Fusion for State Estimation** September 2024 – November 2024
- Developed Extended Kalman Filter-based sensor fusion achieving 17.4% improvement in motion estimation accuracy with 2.3m position accuracy over 3km
- Designed real-time trajectory correction at 40Hz sampling rate, reducing IMU drift by 16% and ensuring precise state estimation for robotic control applications

## Technical Skills

**Technical**: Bipedal Locomotion, Hybrid Dynamical Systems, Zero Dynamics, Gait Design, Whole-Body Control, Motion Planning, Nonlinear Control (MPC, PID), Lyapunov Stability, State Estimation, Kalman Filtering
**Programming**: Python, C/C++, CUDA, MATLAB
**Software**: MATLAB/Simulink, Isaac Sim, MuJoCo, PyBullet, Gazebo, Drake, CasADi, RViz2, Git
**Hardware**: Stereo Cameras (ZED), IMU, Force/Torque Sensors, NVIDIA Jetson Orin, LiDAR, Joint Encoders
**Libraries/Framework**: ROS 2, PyTorch, TensorFlow, Stable Baselines3, OpenCV, Scipy, OpenGym
**Certifications**: Deep Learning, Reinforcement Learning, Mechanism & Robot Kinematics, Systems Engineering