GUDIPATI SADASHIV SHRI RAM

Email: shriram.gudipati@colorado.edu; Phone: +1 (720) 2883345; Portfolio-shriramgudipati.com

LinkedIn - www.linkedin.com/in/shriramgudipati

SUMMARY:

Mechanical Design Engineer with hands-on experience in prototyping, fabrication, and mechanical system development. Skilled in taking concepts from CAD to physical prototypes through iterative design, testing, and refinement. Experienced in designing fixtures, enclosures, and load-bearing structures with a strong focus on manufacturability, assembly, and real-world performance.

TECHNICAL SKILLS:

Controls & Robotics: Feedback Control, State-Space Modeling, Robust H∞ Control, Model Predictive Control (MPC), Nonlinear Control, Kalman Filtering, State Estimation, Sensor Fusion, SLAM, Trajectory Planning, System Identification, Real-Time Control.
Software & Tools: MATLAB/Simulink, ROS2, Gazebo, SolidWorks, Fusion 360, ANSYS Workbench, COMSOL, Lotus Shark, Siemens NX.
Embedded Systems & Electronics: Raspberry Pi, Arduino, SPI, I^2C, PCB Design.
Programming: Python (ROS2 Nodes, Control & Planning Algorithms, NumPy), C/C++, Git.4
MECHANICAL DESIGN & CAD: SolidWorks, Siemens NX, Fusion 360, Parametric Modeling, Assemblies.
Fabrication & Prototyping: Additive Manufacturing (FDM, SLA/Resin, Multi-material Printing), CNC Machining, TIG/MIG/Arc Welding.

TECHNICAL EXPERIENCE:

MACLAB – Matter Assembly Computation Lab | **CU Boulder** *Aug 2025 – Present*
• Designed compliant mechanical structures for capacitive sensing applications, optimizing deformation response under load
• Performed mechanical modeling and experimental validation of stress-strain behaviour in multi-material systems
• Developed a precision rotary encoder (±1° resolution) with emphasis on tolerance, repeatability, and compact design.

Assistant Engineering Supervisor |GVSM Enterprises, Vijayawada Jan 2022 - May 2023
• Designed and developed custom mechanical fixtures for handling specialized loads, incorporating load calculations, material selection, and safety factors to ensure structural integrity and operational efficiency.
• Supervised fabrication and assembly of fixtures, coordinating with shop-floor technicians, validating dimensional tolerances, and ensuring adherence to engineering drawings and manufacturing standards.
• Conducted preventive and corrective maintenance planning for diesel generator systems and fleet vehicles, performing fault diagnostics and coordinating repairs to maintain high equipment uptime.
• Performed material quantity take-offs and developed cost estimation models for fixture design and fabrication, including raw material selection, machining processes, and vendor coordination, ensuring alignment with project timelines and budget constraints.

In-Plant Engineering Intern |Ordnance Factory Medak (Ministry of Defense, Gov of India) Jul 2021 - Dec 2021
• Designed and modeled an automated mechanical door actuation mechanism for armored vehicle applications using Siemens NX, focusing on linkage geometry and range-of-motion constraints
• Analyzed manufacturing and assembly processes for BMP Sarath infantry combat vehicles, gaining exposure to precision machining, tolerance stack-ups, and large-scale mechanical assembly workflows
• Documented component assembly sequences and manufacturing process flows for defense-grade mechanical systems.

EDUCATION:

Master of Science, Mechanical Engineering (Robotics & Controls) |University of Colorado, Boulder, CO, USA Jan 2024 – May 2026
Coursework: Advanced Dynamics, Feedback Control, Linear Systems, Introduction to Robotics, Micro Electromechanical Systems, Robust Multivariable Controls, Systems Engineering, Independent Study (Tactile sensors).

Bachelor of Engineering in Mechanical Engineering |Osmania University, Hyderabad, Telangana, India Aug 2017 - July 2021

PROJECTS:

Transient-Wing Tilt-Rotor Drone
• Designed and developed a tilt-rotor VTOL UAV integrating 4× BLDC motors, ESCs, Li-ion battery systems, and embedded flight control.
• Engineered tilt-wing actuation mechanism with servo-driven transition between hover and forward flight modes.
• Performed structural design and weight optimization using additive manufacturing and CAD-based analysis.
• Integrated IMU, GPS, and RF communication modules for real-time flight control and telemetry.
• Implemented hardware-software integration for control loops and flight stability.

Custom UAV Ground Control Station (Raspberry Pi)
• Designed and built a portable Raspberry Pi-based UAV ground control station with dual joystick controls, NRF24L01 RF link, NEO-6M GPS, and 5.8 GHz FPV receiver for real-time flight monitoring.
• Designed and fabricated a handheld enclosure and mechanical layout for a portable ground control system
• Integrated joystick mechanisms, display housing, and internal component packaging for ergonomic and structural stability
• Developed a modular mechanical design to support rapid iteration and component accessibility

LiDAR-Based Obstacle Avoidance System
• Designed mechanical integration and mounting architecture for LiDAR sensors and actuation components
• Developed a compact system layout ensuring sensor stability and alignment during operation
• Supported integration of sensing and actuation systems within a mobile robotic platform

Quadrotor Dynamics with Wind Gusts
• Simulated PID and MPC controllers in MATLAB/Simulink, improving stability by 40% under wind disturbances.
• Applied Extended Kalman Filter (EKF) for state estimation and sensor fusion, reducing trajectory error.
• Explored nonlinear control for aggressive maneuvers and disturbance rejection.

Automatic Vehicle Detection for Self-Driving Cars – IJARESM, Vol. 11, Issue 8, Aug 2023, ISSN: 2455-6211
• Applied deep learning models (YOLO, Faster-RCNN, SSD) using TensorFlow to improve autonomous vehicle perception, focusing on detection of pedestrians, vehicles, and traffic signals to enhance road safety.