

Vishavjit Singh Khinda

509.768.8958 • vishavjit.khinda@gmail.com • linkedin.com/in/vishavjit-khinda/

SUMMARY

Graduate student in Robotics specializing in mechatronic system design and intelligent automation. Experienced in integrating sensors, actuators, and control algorithms to create autonomous systems, from drone navigation to multi-DOF robotic arms. Strong background in both hardware implementation (microcontrollers, PLCs) and software development (Python, C++, MATLAB, ROS).

EDUCATION

Master of Science in Robotics and Autonomous Systems

Arizona State University, Tempe, AZ

August 2024 - May 2026

GPA: 4.00/4.00

Bachelor of Technology in Mechanical Engineering

National Institute of Technology, Jalandhar, India

August 2019 - May 2023

GPA: 7.75/10.00

TECHNICAL SKILLS

CAD and Simulation Tools: SOLIDWORKS, Simulink, COMSOL, ANSYS, ABAQUS

Programming & Documentation: C, C++, Python, MATLAB, Machine Learning, Microsoft office (Excel, Word, PowerPoint)

Manufacturing & Analysis: 3D printing, Lean six sigma, Geometric Dimensioning and Tolerance

Robotics & Automation: Robot Operating System (ROS), Motion Planning, PLCs, Microcontroller (Raspberry Pi, Arduino)

Interpersonal skills: Collaborative team-work, Leadership, Problem solving, Time management, Effective communication

Certifications: Six Sigma White belt (May 2025), Comprehensive Course on SolidWorks (Jan 2025)

PROJECTS

Autonomous Line Following Drone | ASU

Spring 2025

- Modeled an efficient control architecture in Simulink, using RGB color space conversion to create binary image for enhanced detection of colored line. Implemented custom submatrix blocks to analyze specific pixel regions of binary image coming from the drone's camera for navigation decisions (left, right, forward).
- Implemented blob analysis block for circle detection, and used the area of the circle as a threshold parameter for landing signal. Incorporated a state flow machine with five different states for path planning.
- Achieved autonomous blue line tracking and center-circle landing with an accuracy of ± 2 mm using limited computational resources on the mambo drone platform, demonstrating robust performance in real-world flight conditions.

Autonomous drone landing on moving platform | ASU

Spring 2025

- Developed advanced computer vision algorithm in Simulink using RGB-to-binary image processing for enhanced detection of 10×10 inch moving platform, using area as a threshold for reliable platform identification in dynamic environments.
- Implemented four-state flight control system (Take-off, Detection, Tracking, Landing) with predictive path planning algorithms to anticipate platform movement and maintain precise drone positioning during approach sequences.
- Achieved accurate autonomous landing on the centre of moving platform with controlled descent and adaptive state switching mechanism when the target is not visible, demonstrating advanced target tracking capabilities.

Finite Element Analysis of Tapered Nichrome wire | ASU

Spring 2025

- Developed a finite element program in MATLAB using linear and quadratic elements to approximate the steady-state temperature field and heat flux of a nichrome wire with varying cross-sectional area.
- Modeled the wire in ABAQUS software and computed exact solution using the symbolic math package in MATLAB.
- Verified the FEM approximate solution against ABAQUS and exact solution with an error margin below 2%, demonstrating strong computational modeling skills.

3 DOF Robotic Arm with Kinematic Modeling | ASU

Fall 2024

- Collaborated with a team of five members to design a low cost, programmable, 3 DOF robotic arm to perform autonomous pick-and-place operation of a small cubical object.
- Designed the links and gripper parts in SOLIDWORKS, 3-D printed using PLA and PETG materials, and integrated MG5465 servo motors and electro-mechanical control interfaces for precision joint actuation.
- Developed a robust inverse kinematic algorithm in Python that actuated the servo motors using PWM signals from a Raspberry Pi 5 microcontroller to execute the task with 98% accuracy and repeatability.

WORK EXPERIENCE

Rail Coach Factory, Kapurthala, India: Manufacturing Engineering Intern

June 2022 - July 2022

- Operated automated CNC machining systems and integrated manufacturing equipment in a high-volume production environment (200+ rail bogies/month), gaining hands-on experience with industrial control systems and process automation.
- Collaborated with cross-functional engineering team, targeting automated production line efficiency, achieving 6% enhancement through data-driven process analysis and control system optimization.
- Conducted systematic troubleshooting of integrated mechatronic systems (HVAC controls, pneumatic actuators, sensor networks) using industrial diagnostic protocols, maintaining ISO-compliant operation across 50+ vehicle platforms.