

Vishavjit Singh Khinda

509-768-8958 | vishavjit.khinda@gmail.com | linkedin.com/in/vishavjit-khinda/ | www.vishavjitkhinda.com

SUMMARY

Robotics and Automation Engineer with 2+ years of experience optimizing manufacturing processes. Graduate-level expertise in industrial robotics, control systems, PLC programming, SCADA/HMI development, machine vision, ROS and IIoT systems integration to improve manufacturing efficiency, reliability, and operational performance.

EDUCATION

Master of Science in Robotics and Autonomous Systems

August 2024 - May 2026

Arizona State University, Tempe, AZ

GPA: 4.00/4.00

Bachelor of Technology in Mechanical Engineering

August 2019 - May 2023

National Institute of Technology, Jalandhar, India

GPA: 7.75/10.00

WORK EXPERIENCE

JREW Engineering, Punjab, India | Manufacturing Engineer

May 2022 - April 2024

- Led manufacturing **process optimization** across CNC machining & assembly lines, which met **production targets** ahead of schedule.
- Reduced cycle times by **8–10%** and improved **OEE** through time-motion studies, line balancing and capacity analysis.
- Conducted root cause analysis (**5 Whys, Fishbone**) on recurring defects and drove **lean** initiatives (5S, **Kaizen**, standard work) reducing scrap by **5%**, while improving first pass yield.
- Collaborated with **cross-functional** engineering teams (design and quality) to enforce **GD&T** standards and optimize **CNC machining** parameters, reducing machining **rework** by **3%** and downstream **assembly** issues.

TECHNICAL SKILLS

Robot Programming: FANUC (Teach pendant), Elephant Robotics Cobot Pro 600, Dobot M1 SCARA

Industrial Networking & Protocols: MQTT, Modbus TCP/IP, Profibus, OPC UA, SECS/GEM, EtherNet/IP, DeviceNet

Automation & PLCs: Ignition, Allen-Bradley (Micro 820, CompactLogix 5000), Arduino OPTA, Ladder Logic, Structured Text, FBD

Manufacturing: Lean Six Sigma, 5S, Kaizen, 5 Whys, 3D printing, CNC Programming, Geometric Dimensioning and Tolerance, SOLIDWORKS

Robotics & Control Theory: ROS, YOLOv5, LIDAR, SLAM, Perception, Path Planning, Kinematics, Machine Learning, Motion Control, PID

Programming: Python, C, SQL, OpenCV

PROJECTS

Automated Wafer Manufacturing Robotic Cell | ASU

Spring 2026

- Led a team in **commissioning** a fully automated multi-robot work cell, integrating a **Dobot SCARA** robot, **Cobot Pro 600**, **conveyor**, vision camera and proximity sensors, coordinated via an **Allen-Bradley Micro 820 PLC**.
- Developed an **Ignition SCADA** HMI for real-time process monitoring, **alarm management** over **EtherNet/IP**, designed custom grippers in **SOLIDWORKS**, replicating real semiconductor wafer handling process.
- Implemented a **machine vision** system using **Python** and **OpenCV** (Hough Circle Detection) for automated in-line wafer inspection and **quality control**, reducing manual quality checks.

Autonomous Mobile Robot (AMR) Navigation System | ASU

Spring 2026

- Developed a real-time lane-following **AMR** using the **ROS** framework, **OpenCV** HSV color segmentation, and a tunable **PID controller**, achieving stable centerline navigation.
- Trained a custom **YOLOv5** object detection model on 500+ images captured by robot's **RGB-D camera** to recognize five traffic-sign classes, achieving **88.9% mAP** on a **Jetson Nano** GPU.
- Integrated **RPLIDAR A1** obstacle avoidance with **sign detection** and **lane-following** functions through a four-state priority-based state machine, enabling fully autonomous navigation.

Supervisory Motor Control System using PLC, Ignition, and Modbus TCP | ASU

Spring 2026

- Programmed an **OPTA PLC** using **FBD** and **Structured Text** programming (IEC 61131-3) for 24V DC motor control with directional safety interlock design.
- Configured **Modbus TCP/IP** communication (Holding/Input Registers) between **PLC** and **Ignition HMI**, enabling bidirectional, real-time data exchange over Ethernet.
- Built a customized **Ignition HMI** with real-time motor status indicators and direction command buttons, enabling remote **supervisory control**, alongside physical toggle switches.

FANUC Teach Pendant Palletizing Program | ASU

Spring 2026

- Programmed a **FANUC industrial robot** to autonomously pick and place a 2×3 grid of components using a single taught position register and nested loop logic, making it scalable to any grid size.
- Implemented **offset programming** technique to compute all **pick and place** positions, significantly reducing setup time.

Smart IIoT Manufacturing System for Predictive Quality Control | ASU

Fall 2025

- Architected 5-layer IIoT system: device layer, **MQTT** transport, edge ML inference, **PostgreSQL** database and **Streamlit** dashboard for real-time semiconductor **wafer defect** detection.
- Achieved **94%** defect prediction accuracy, **70%** recall with <50ms inference latency using an edge-based **XGBoost** ML model.
- Created multi-line production **dashboard**, with real-time process parameter charts, **defect prediction** display, alert acknowledgment system for enhanced operator decision-making.

CERTIFICATIONS

Ignition 8.3 (June 2026), SACA certified Industry 4.0 Associate - IIoT, Networking and Data Analytics (June 2026), SACA Robot System Operations (Mar 2026), SACA Programmable Controller Systems I (Apr 2026), SACA Programmable Controller Troubleshooting I (Apr 2026), Universal Robots e-Series Pro Track (Oct 2025), Six Sigma White Belt (May 2025), Machine Learning and Data Analysis with Python (Oct 2025)