

SAMEERJEET SINGH CHHABRA

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EDUCATION

Arizona State University

M.S. Mechatronics, Robotics & Automation Engineering — GPA: 3.83/4.0

Tempe, USA

Graduating May 2026

Chhattisgarh Swami Vivekanand Technical University

B.Tech Mechanical Engineering — GPA: 3.49/4.0

India

Graduated July 2022

TECHNICAL SKILLS

PLC & HMI: Allen Bradley PLC, Studio 5000 Logix Designer, Ignition SCADA HMI Development, Connected Components Workbench, Factory IO

Industrial Robotics: FANUC Teach Pendant Programming, FANUC ROBOGUIDE, SCARA Systems, Palletizing, 6-DoF Arms

Industrial Protocols: MQTT, OPC UA, Modbus, TCP/IP, I2C, SPI, UART

Process Control & SCADA: PID Control, Motion Control, MPC, Kalman Filter

Programming: Python, C++, MATLAB/Simulink, SQL, Git/GitHub

ML & Edge Computing: XGBoost, TensorFlow, PyTorch, OpenCV, YOLOv8, AWS IoT, PostgreSQL

Design & Simulation: SolidWorks, Creo Parametric, MuJoCo, URDF Modeling, 3D Printing

Certifications: SACA Certified, Deep Learning Specialization, IBM ML & Data Science

PROJECTS

PLC-Controlled Semiconductor Automation System | SCARA & 6-DoF Robots

February 2026 – April 2026

- Integrated SCARA and 6-DoF collaborative robots, conveyor automation, infrared sensors, and Allen Bradley Micro820 PLC for autonomous semiconductor wafer handling.
- Developed Python-based Ethernet/TCP robot communication, dynamic waypoint generation, and inverse kinematics for real-time multi-robot coordination and motion control.
- Built PLC ladder logic, HMI controls, and relay-based industrial I/O interfacing, while designing custom 3D-printed end effectors and wafer handling fixtures.

FANUC Robot Palletizing System | Teach Pendant Programming

Fall 2025

- Programmed FANUC industrial robot via teach pendant to palletize 12 objects across a 3×4 grid using dynamic position register (PR) updates and loop-based program structure.
- Achieved ±2 mm positioning accuracy across all grid positions and product dimensions through optimized motion path tuning.
- Built modular program architecture enabling full reconfiguration for 5+ distinct pallet layouts through a single parameter adjustment — zero reprogramming required per layout change.

Smart Semiconductor Manufacturing | IIoT Edge ML (Hardware-in-the-Loop)

Fall 2025

- Architected a 5-layer IIoT system integrating real hardware sensors with MQTT messaging, OPC UA, edge XGBoost inference, and PostgreSQL time-series storage for real-time wafer defect detection.
- Achieved 94.5% detection accuracy and 79.8% recall on a 4,219-sample dataset with <50 ms edge inference latency — meeting production-grade response requirements.
- Built Streamlit SCADA dashboard with live parameter visualization, defect alerts, and multi-line production status, replicating operator-facing industrial HMI design patterns.

6-DoF Robotic Arm | Custom IK Solver & Computer Vision

August 2024 – December 2024

- Derived and implemented a Newton-Raphson inverse kinematics solver from scratch achieving ±0.2 mm end-effector positioning accuracy across the full workspace.
- Integrated real-time OpenCV vision pipeline with A* path planning and camera-to-robot homogeneous transform; solved physical maze course with 95% success rate across 20+ trials.

Voice-Operated Mobile Manipulator | ROS2 Full-Stack Integration

January 2025 – May 2025

- Integrated TurtleBot4 and myCobot 280 arm using ROS2, MoveIt2 motion planning, and YOLOv8 object detection (92% accuracy); deployed SLAM with Monte Carlo localization achieving ±5 cm positioning accuracy.
- Embedded speech-to-text voice command pipeline achieving 85% recognition accuracy in live, unscripted operation.

PROFESSIONAL EXPERIENCE

Physics Teaching Aide – Arizona State University

Tempe, AZ, January 2025 – Present

- Independently run 8 hrs/week of hands-on lab sessions for 96 students across University Physics 1 & 2; responsible for experimental setup, data quality, and real-time troubleshooting of lab equipment.

Data Scientist – ANYTHINGAI Cyber Pvt. Ltd.

Hyderabad, India, July 2023 – March 2024

- Reduced data pipeline runtime by 98% through Python automation (Selenium, BeautifulSoup, APIs); deployed ML inference systems on AWS achieving 30× throughput improvement.
- Built and validated predictive models with real-time processing, directly informing production system decisions.

CAD Design Intern – Design Center Pvt. Ltd.

Bhilai, India, June 2021 – July 2021

- Converted engineering drawings into 3D production models for 10+ mechanical components (gears, tires, assemblies) in Creo Parametric; performed motion analysis that improved prototype-to-production accuracy by 15%.

ACHIEVEMENTS & RECOGNITION

- Honeywell × ASU Hackathon 2026:** 3rd place, \$2,500 — developed an intelligent robotic tube insertion system for heat exchangers using chamfered alignment, vibration-based self-alignment, and linear actuation; validated with 3D-printed prototypes.
- Los Alamos National Laboratory × ASU Hackathon 2025:** 2nd place, \$5,000 — designed automated mechanical unpacking and sequencing system for MinION Flow Cells under time constraints.
- Publication:** Cable-Suspended Parallel Robot (FarmPet), IJRASET, Feb 2023.
- GHOST Lab ASU:** Hands-on operation of Fetch, YuMi, Husky, UR5, and TurtleBot platforms for HRI research.