Sakshi Gauro

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EDUCATION

Worcester Polytechnic Institute (WPI) May 2025 | Worcester, MA
Bachelor of Science in Robotics Engineering, **Minor** in Computer Science
Relevant Coursework: Algorithms, CAD, Embedded Computing in Engineering Design, Software Engineering, Databases, Artificial Intelligence for Robotics, Control Engineering, Unified Robotics (I-IV), Industrial Robotics

TECHNICAL EXPERIENCE

Symbiotic Multi-Agent Construction (SMAC), *WPI* Aug 2024 – May 2025
- Designed a **collaborative, decentralized multi-agent** construction system for risk-prone environments (e.g., space, underwater) using two 5-DOF (Degree Of Freedom) inchworm robots and smart blocks, coordinated through stigmergy inspired coordination protocol
- Developed a **modular state machine architecture** for each inchworm, enabling fault-tolerant task execution and dynamic decision-making without centralized control
- Achieved successful dual-inchworm coordination in simulation, completing a 1×2×3 structure with **100% block placement accuracy (6/6)**, validating **dynamic path planning** and demonstrating the scalability of the system architecture

SoilX, *WPI* Nov 2022 – May 2023 | Worcester, MA
- Developed a cost-effective system for precise soil moisture estimation using a custom radar, improving agricultural irrigation methods with high-resolution, multi-depth data.
- Converted 100+ files of C++ and Lua code into Python, improving readability, and tested the radar's Spectrum Analyzer and Signal Generator (ADF 4350) to identify and fix errors.
- Integrated the Spectrum Analyzer and Signal Generator, resolving setup challenges and enabling better signal analysis for future optimizations.

PROJECTS

Industrial Automation & PLC Control Systems Bootcamp, *Udemy* Jun 2025 – Present
- Designed and implemented multiple **industrial automation systems** using **Siemens TIA Portal**, **RSLogix**, and **Factory I/O**, covering digital and analog I/O, relays, timers, and safety interlocks.
- Programmed and simulated **start/stop**, **motor direction**, **interlocking**, and **temperature control** circuits, applying ladder logic to achieve fully automated and fault-tolerant operation.
- Completed two course capstone projects: a **Factory I/O height-sorting system** and a **2-of-4 Automatic Transfer Switch (ATS)** with 100% operational reliability in simulation.

Advanced Palletization Simulation (RobotStudio, ABB IRB 1600), Mar 2025 – May 2025
Industrial Robotics (RBE 4815)
- Programmed an advanced palletizing simulation in **RobotStudio** using the **ABB IRB1600**, automating the sorting and stacking of three box types from a randomized conveyor belt input with slip sheet placement between layers
- Developed modular **RAPID code** with case-matching logic, volume sensor triggers, and dynamic orientation algorithms to replicate real-world industrial stacking patterns
- Successfully simulated full palletizing behavior for three box types with up to **7 stacked layers** showcasing **realistic robot behavio**r, **modular logic design**, and **industrial automation planning**

Robotic Arm, *Unified Robotics IV (RBE 3001)* Aug 2023 – Oct 2023
- Automated sorting with 4 DOF OpenManipulator-X robot and **enhanced kinematics solutions** such as forward and inverse kinematics, velocity kinematics and trajectory planning
- Automated sorting operations achieving **95% object detection accuracy** for 3D-printed balls, successfully implementing **dynamic camera tracking** for precise end-effector movement
- Optimized pick-and-place operations with **quintic trajectory planning** and **dynamic camera tracking**, improving object handling accuracy by **70%**, measured by increased successful placements in test trials

Brigham & Women's Hospital application, *Software Engineering (CS 3733)* Mar 2023 – May 2023
- Collaborated with a team of 10 software engineers to build a Java Kiosk **pathfinding**, map editing applications and an **emergency alarm system**
- Designed and maintained the database architecture using **Postgres** to ensure efficient data storage, organization, and retrieval,
- Implementing **Agile methodologies** with **Jira** and **GitHub** for effective user story organization and task tracking.

LEADERSHIP

Association for Computing Machinery, *Hackathon Manager* Apr 2022 – Feb 2023
- Organized GoatHacks 2023, a 48-hour hackathon for 200+ attendees with a $10,000+ budget, coordinating logistics, outreach, and judging

SKILLS

Programming and Software Development
Python, C++, Java, C, SQL, JavaScript, HTML, JUnit, Git, GitHub, Object-Oriented Programming (OOP), Data Structures & Algorithms, Design Patterns, Agile Methodologies, Test-Driven Development (TDD), Debugging

Robotics & Simulation Tools
ROS2 (Robot Operating System), ROS, Gazebo, Rviz, RobotStudio (ABB), MATLAB, State Machines, Path Planning (A*, BFS, D* Lite), SLAM, Ubuntu, Linux, Bash, Micro ROS

Hardware and Prototyping
3D Printing, Laser Cutting, SolidWorks, Soldering, Oscilloscope, Sensor Integration, Additive Manufacturing, Arduino, Raspberry Pi