# Akanksha Murali

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## Education

**New York University**, Tandon School of Engineering - New York *May 202*
Master of Science in Mechatronics, Robotics and Automation Engineering
*Relevant Coursework:* Robotics Control System, Deep Learning & Robot Perception, Reinforcement Learning & Optimal Control for Robotic

**PES University** - Bangalore, India *May 2023*
Bachelor of Technology in Electronics and Electrical Engineering
*Relevant Coursework:* Control Systems, Digital Image Processing, Neural Networks & Fuzzy Logic Systems

## Technical Skills

**Control Systems:** PID, MPC, State Estimation, Kalman Filters, Sensor Fusion, LQR, PLC Ladder, Numerical Optimization
**Hardware Tools:** Jetson Nano, STM, ESP32, Unity, LabVIEW, Fusion360, SolidWorks, ZED Stereo Camera, Arduino
**Communication Protocols:** UART, USB, I2C, SPI, Dynamixel Protocol 2.0, BLE, WiFi, MQTT, CAN
**Programming Languages:** Python, C++, C, Java, HTML, SQL, Linux Bash
**Frameworks & Libraries:** PyTorch, TensorFlow ROS Humble, OpenCV, SciPy, Pinocchio, Simulink, MATLAB, SLAM
**Robotics & Embedded Systems:** ROS2, Sensor Fusion, Motion Planning, Embedded Firmware
**Simulation & Design Tools:** Unity, Blender, Innventor, Fusion 360, Gazebo, NumPy, Pandas, Git, Scikit-learn
**Tools & Others:** Git, Jira, LabVIEW, LPKF CircuitPro, KiCad, Overleaf

## Relevent Experience

**ModeliCon Infotech** | Machine Learning & Simulation Engineer | Bangalore, India *Aug 2022 - Jun 2023*
- Developed a **Unity-based digital twin framework** for simulating robotic control loops and visualizing **sensor feedback**
- Automated simulations using **C++**, reducing **training time** by **30%**
- Designed embedded **control logic** for robotic systems, enhancing **response precision & reliability**

**Nivetti Systems** | Robotic Controls Intern | Bangalore, India *Jan 2022 - Jul 2022*
- Designed and implemented **ROS2 simulations** for **3D object detection** and **mapping** on a **6-DOF robotic manipulator**
- Optimized **motion planning algorithms** improving pick-and-place **accuracy by 20%**

**Equinox PESU** | Project Lead | Bengaluru, India *Mar 2021 - Jun 2021*
- Led an **8-member engineering team** to design a **terrain-adaptive Mars rover prototype** in collaboration with **ISRO**
- Applied **inverse kinematics** improving **manipulation dexterity** by **28%**
- Integrated **FPGA-based motor control** ensuring real-time responsiveness and system reliability in rough terrains

## Academic Projects

**Hexapod** | NYU Capstone Project | New York *Fall 2024 - Spring 2024*
- Developed **firmware** for **motor control** implementing **MPC & PID** for stable multi-legged locomotion
- Tuned control parameters to improve **robot stability & agility** on uneven terrain
- Designed and fabricated **custom PCBs** enabling seamless **enabling seamless hardware-software integration**

**Embodied AI Visual Navigation** | NYU | New York *Fall 2024*
- Implemented a **vision-based control strategy** using **feature detection and binary image filters**
- Coupled **obstacle detection logic** with **Dijkstra's algorithm** to enable **autonomous path planning**

**Robotic Arm for Mobile Payload Carrier** | PES Capstone Project | Bangalore, India *Spring 2023*
- Designed **closed-loop elevator interface** with HMI and implemented **sensor-actuator feedback control**
- Improved payload handling accuracy by **8%** through robust **control integration**

**Automated Pill Pal** | NYU | New York *Spring 2023*
- Created a **medication dispensing control system** using **using Propeller microcontroller & RTC-based logic**
- Integrated **buzzer and Ultrasonic-based feedback** for schedule compliance

**Automated Gesture Lamp and Sorting Systems** | NYU | New York *Fall 2023, Spring 2024*
- Built a **gesture-actuated lamp** using **IR, ultrasonic, and APDS sensors**
- Developed an **automated waste segregator** using **color sensors and servo-diverters**
- Engineered a **sorting platform** with **Raspberry Pi, PiCam**, and GPIO-triggered logic, reducing cycle time by 150 seconds

## Leadership Experience

**Graduate Adjunct** | NYU | New York *Summer 2024 - Summer 2025*
- Mentored **220+ students** in **Kalman filters, state estimation, and MATLAB/Simulink control modeling**
- Led **hands-on labs** in **PID tuning, feedback control, and robot simulation using ROS2**