

# Surveillance Robot Training Simulation

This project presents a Surveillance Robot Training Simulation developed for immersive virtual reality using the Meta Quest 2. The simulation enables users to train in operating a surveillance robot within an interactive and realistic virtual environment. It replicates real-world scenarios where users can practice assembling robotic components and executing missions in a safe, controlled VR space. By leveraging the Meta Quest 2, the system provides hands-on experience without the need for physical hardware, significantly reducing costs and risks while improving learning efficiency and engagement.

## Features

The immersive VR training experience offers a fully interactive 3D environment developed for the Meta Quest 2, delivering a realistic and engaging platform for learning. Central to the experience is a robot assembly simulation that guides users through a step-by-step process to virtually construct surveillance robot components, thereby deepening practical understanding of robotic systems. The platform features VR-optimized UI/UX, incorporating both hand tracking and intuitive controller-based controls for seamless interaction. This risk-free virtual environment allows trainees to make mistakes and refine their skills without the danger of damaging real hardware. As a cost-effective alternative to traditional training, it eliminates the need for physical robots and components, significantly reducing associated expenses. Additionally, integrated performance analytics track user progress and deliver real-time feedback, ensuring continuous improvement. The modular design of the environment also allows for customization, enabling simulation of diverse terrains and operational scenarios to meet specific training requirements.

## Benefits / Impacts

- **Enhanced Skill Acquisition** – Provides hands-on, interactive learning that accelerates understanding and retention of complex robotic assembly processes.
- **Reduced Training Costs** – Eliminates the need for physical equipment, minimizing material expenses and logistical overhead.
- **Improved Safety and Flexibility** – Offers a risk-free environment where users can practice and adapt to various operational scenarios without real-world consequences.

