NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Computer Science and Engineering
College of Engineering

Remote Teleoperation with Object Detection

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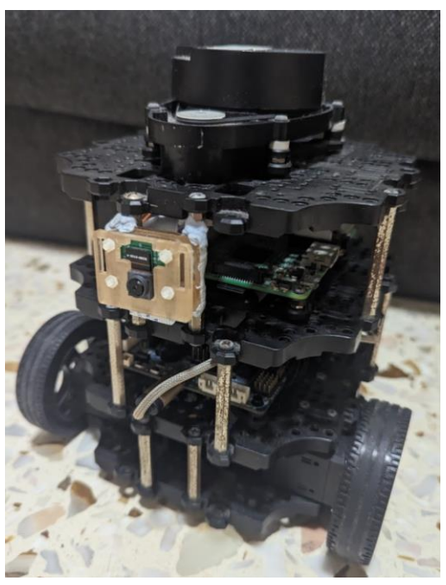
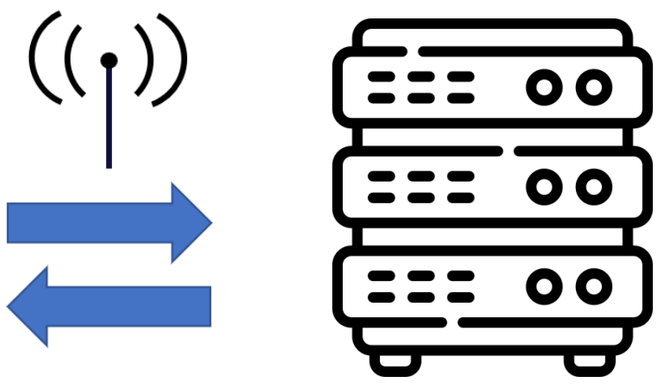
This project aims to develop a remote-controlled robot with **video livestream capabilities** and **cloud-based object detection.** The robot will transmit a video livestream over **Wireless Local Area Network (WLAN) or cellular network**, allowing the operator to control its movement and receive real-time updates on the environment via **Meta Oculus Quest 2** or a **webapp**.



Turtlebot3 Burger



Server

Oculus Quest 2

- Robot on cellular network can be controlled from anywhere
- Cloud-based object detection to reduce robot's power usage
- Results can be visualised on webapp and Oculus Quest simultaneously
- Overall tripartite latency averaging **100ms** from robot to headset via server.

Detection Results

ROS Robot Operating System

Unity

WireGuard

PyTorch