![Nanyang Technological University Singapore]

School of Computer
Science and Engineering
College of Engineering

# Remote Teleoperation with Object Detection

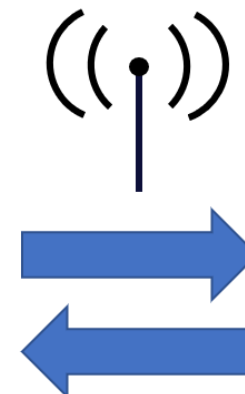Student: Foo Jun Ming          Supervisor:  Dr Smitha Kavallur Pisharath Gopi

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**.
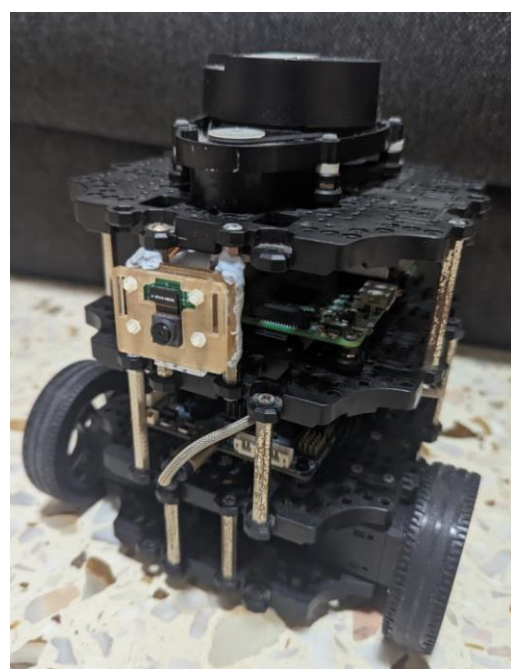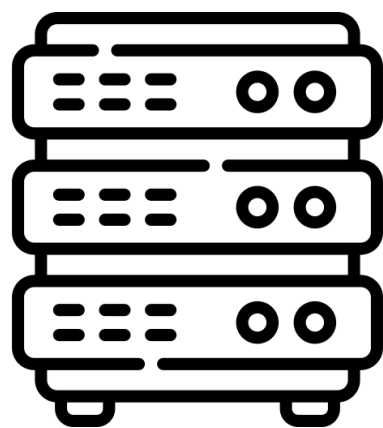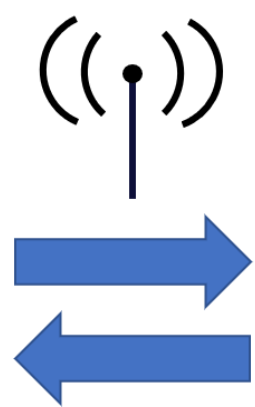


**Turtlebot3 Burger**          **Server**          **Oculus Quest 2**

- 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