# Motion Controlled Robot

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## BACKGROUND AND OVERVIEW

This project seeks to explore alternative methods of interfacing with technology. The concept will be explored by controlling a robot using hand motion.

A compact motion sensor is attached to a strap which tracks hand motion. This sensor communicates with a microcontroller on the robot via Bluetooth, which then uses the data to send appropriate movement commands to the robot.

## DESIGN PROCESS MILESTONES

➔ Sensor to microcontroller communication via Bluetooth
➔ Arduino to robot communication and control via UART
➔ Sensor data converted to recognizable motion states
➔ Microcontroller to Arduino communication via UART
➔ Successful full system operation test
➔ Microcontroller to robot communication via UART
➔ Successful full system operation (sans Arduino) test

## SYSTEM OPERATION
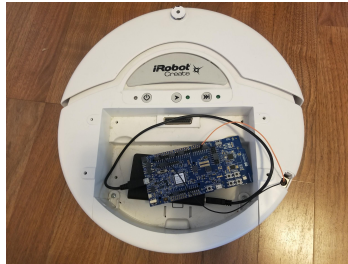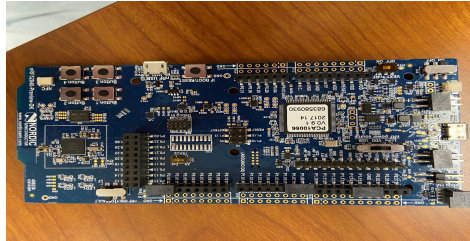


➔ NRF52840 BlueTooth module
➔ ICM-20948 motion sensor detects rotation, acceleration, and direction
➔ 3D printed case

Quaternion sensor data via BlueTooth



➔ NRF52840 dev kit
➔ Filters data & converts quaternion to motion states
➔ Converts motion states to robot control commands

Command Packet via UART



➔ iRobot Create
➔ Open interface allows for easy control
➔ Receives 4-5 byte control commands