Benchmarking write up

Data collection –

I used the IMU device, I plugged it into the chair’s underneath USB port and connected it to the laptop. From there I ran the NGIMU software, ensuring the device was connected to the laptop and ran data collection for 500 seconds while the chair completed the desired task (executing a full route or 10x 180 degree turns). Once the chair has finished moving, I stopped the data collection.

Data collation –

To get the chair’s exact angles I opened up the ‘Euler’ excel file, from there I looked at the angles and times. To get the angle, look at the ‘Yaw’ values, once I saw the Yaw value change from its original angle I followed that down till the value became static again, this was counted as a complete turn. I then calculated the actual rotation angle the chair moved and the difference between the desired angle and the executed angle. I then totalled the angle difference from all the movements and averaged it to get the final accumulated error for that speed and degree turn.

To get the chair’s angular velocity I opened up the ‘Magnitude’ excel file, I looked at the ‘Gyroscope’ value in order to get the degrees per second. From there I matched up the times from the ‘Euler’ file in order to find out where a turn started and ended. I then cross referenced these times in the ‘Magnitude’ file to see where a turn started and get the angular velocity over that turn. I then took 3 of these turns and average them out to get the angular velocity of that speed and degree turn.