Path planning

After determining the waypoints, these were then converted to linear distance in millimeters and angular displacement in radians to be sent to the Arduino. We looped over the

To determine the turn radius, we used the equation below, where we centered our turns such that the origin was straight ahead at the robot's $\frac{\pi}{2}$ axis and corrected the angles by subtracting the previous heading.

$$\theta_{\text{Calc}} = \text{atan2}(\text{Diff\_z}, \text{Diff\_x})$$

$$\theta_{\text{Center}} = \theta_{\text{Calc}} - \frac{\pi}{2}$$

$$\theta_{\text{Correct}} = \theta_{\text{Center}} - \theta_{\text{Prev}}$$

Since we found that are detection was often providing us with a Euclidean distance that was greater than what we expected, we reduced the depth measurement by 20% by multiplying it by 0.8.

Prototyping