

PointBot Design Project

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ABSTRACT:

This research incorporated a long range ground sensor into the senior design project, PointBot. PointBot is a tele-operated/semi-autonomous unmanned vehicle that can be programmed to go in multiple directions, patterns or waypoint, while keeping a certain amount of distance in front of the trailing vehicle. PointBot used a Qwerk microcontroller to control servos, communicate with the base station in the trail vehicle, and receive the sensor data. Integrating the SICK LMS-200 into the PointBot required upgrading the microcontroller from the Qwerk to the Via ARTiGO. The SICK LMS 200 sensor has a maximum range of 81.91m or approximately 268 ft. This additional range allowed the PointBot to increase its safe speed of 6 mph to 15 mph. The additional range will also allow for more robust anti-collision navigation algorithms allowing the robot to avoid more obstacles rather than currently just braking to a complete stop. This project has many uses in both the civilian and military sectors.

KEYWORDS: robotics, mechatronics, sensor integration, unmanned ground vehicle

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