VarastoRobo – Obstacle Detection

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Introduction

The aim of this project was to make an autonomous storage management system, in which multiple devices work in co-operation to transport ordered packages to a drop-off point. In addition a drone was to function as surveillance system for the premises.

Objectives

Our part of VarastoRobo -project was to design an obstacle detection system for GoPiGo3 robot (FIGURE 1). This was needed because GoPiGo3 is required to check the route defined by the master device. It was required to design the system to be modular, so it would be easy to implement to other parts of the project.

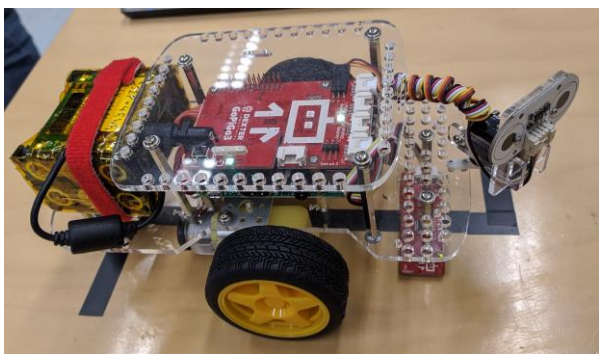

FIGURE 1. GoPiGo3 -robot

Methods

To solve the obstacle detection problem, it was decided, that optical distance sensor and a small servo was to be used. Servo turns the optical distance sensor to different angles, to detect the obstacles in front of the robot and the both sides of the path.

Modular python code component was developed to drive the servo, read distances from the optical distance sensor and report possible obstacles back (FIGURE 2).

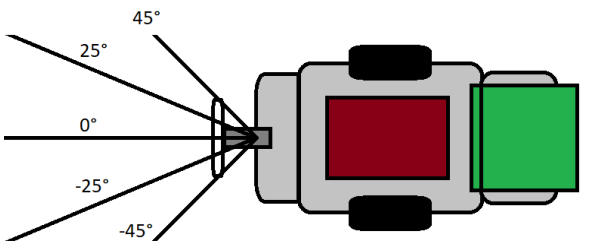

FIGURE 2. Drawing of working principle

It was also noticed that the provided NiMH –battery packs were in very bad condition, so to ease the development process, two 3S2P, 18650 lithium-ion battery packs and constant current/voltage charger (FIGURE 3) were built, that can supply power to the robot for the whole day.

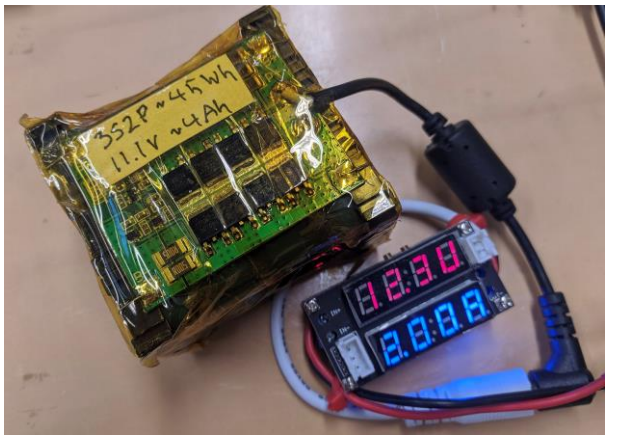

FIGURE 3. Lithium-ion battery pack and charger

Results

The system worked as planned. After an obstacle is detected in the path of the robot, it is reported back.

Conclusions

Obstacle detection met its stated purpose. The development team learned valuable lessons in python coding, group project work and its methods.

References

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3. VarastoRobo GitHub: https://github.com/Jarno-Poikonen/VarastoRobo

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