

Experiments in Robotics and Perceptions

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ABSTRACT:

The primary purpose of our experimentation was to make a Segway RMP (Robotic Mobility Platform) an autonomous unit. We did so by integrating a common notebook computer, two car batteries, and a SICK Laser (ladar). By combining all of these resources and creating an algorithm with National Instruments LabView, we created a simple obstacle-avoiding platform.

The bulk of the labor for this project went into the programming. We integrated code given to us in C++ from the RMP, ladar, and concurrent hardware into our LabView program. The algorithm interprets C++ input gathered from the ladar, processes, and outputs the information into the RMP. Relating the ladar input to the RMP required converting hexadecimal values to information interpretable by a common user. In order to increase ease of use and make the algorithm more user-friendly, we developed an interface that any trained user can work with. The RMP then translates the ladar and user information into motion, discriminating between optimal paths for travel.

After developing a basic obstacle-avoidance routine for the system, we hope to narrow the scope of the project and find an effective use of the RMP in field applications. There are several possible directions the project can now take. One possibility is to make the RMP a mule vehicle. It has a 100 pound payload and is capable of moving 8 mph- ideal for carrying supplies for dismounted troops. There was also a notion for connecting two or more RMPs together in order to provide greater payload, stability, and mobility. Whatever direction the project goes in, the algorithm we created will provide the scheme for which improvements will be made.

KEYWORDS: Segway, Robotic Mobility Platform, Sick, ladar

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