

User Controlled Lighting Enhancement Vehicle Attachable Turret

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Abstract

A device was developed so that the pilot of a vehicle can direct a powerful light beam in a practical way. It consists of a vehicle attachable turret which is controlled via head movements or a smartphone app. The smartphone application gives versatility to the project since it opens the possibilities of controlling the turret.

The turret was controlled via head movements, in order to make a prototype for the project it was idealized to build a car robot that would simulate the final goal of putting the device in a vehicle, in order for testing, a controller device was necessary, and for connecting the controller to the robot JavaScript was very useful since it would allow the mini-computer on the car robot to connect to the controller using internet.

A JavaScript code was made in order to keep track of the inputs made by an XBOX controller. This code was achievable after honing skills on the language program that is used for both mechanical technology and websites.

In the process of better understanding robotics and improving the curriculum on the skills that will in the future be necessary to build more complex robots; the Quanser Qube-2 was utilized. A little, programmable robotic device that can be used to understand reverse kinematics, a field in physics very relevant for robotics engineering when designing a robotic piece and making sure it will work as intended.

After honing skills with the Quanser Qube-2 it was possible to make the stick in it stand on its own and it was able to get back up after being dumped thanks to a code based on complicated mathematical equations that take into account kinetic, and mechanical energy, between other things. This helped students consider many factor in the bigger scale of the project.