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Project Proposal

Overview

We plan to make an autonomous vehicle able to follow objects and avoid obstacles. When the vehicle does reach the the object, it will move back to its starting position.

Control of the vehicle will be handled by a programmed arduino. The vehicle will be moved with two encoded wheels powered by separate micro metal gearmotors through a motor shield. Object finding will be done using one forward facing ultrasonic sensor and rotation of the body. Two extra ultrasonic sensors will be used for object avoidance or helping with object finding.

Major Software Components

1. Implement Ultrasonic Sensors
2. Implement Motor Shield and Motor Control
3. Implement Wheel Encoders and Location Tracking
4. Implement an algorithm so the vehicle can translate ultrasonic sensor readings into information about the location of the object.

Prototype Plan - Experimental

We think the prototype will be experimental since our project cannot evolve into a real product. Instead, it is a way for us to improve our skills and demonstrate a proof of concept.

Hardware

1. 1 Arduino Uno
2. 1 Motor Shield
3. 2 Micro Metal Gearmotors
4. 2 Pololu Wheels for Micro Metal Gearmotors
5. 2 Optical Encoders for Pololu Wheels
6. 2-3 Ultrasonic Sensors
7. 2 9 Volt Battery

Anticipated Challenges

1. Accurately detecting and recognizing objects using only using stationary (relative to the body) ultrasonic sensors
2. Constructing a stable body for the vehicles to hold motors, sensors and Arduino.