Advanced Universal Parking Sensor System
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Goal
- Produce a low cost universal parking sensor system
- Display a continuous varying visual to give the driver a true sense of distance from their vehicle to an object.

Motivations and Objectives
- Motivations
  - Fill the current void in the market with a parking sensor system solution that gives the user an accurate depiction of the distance between the car and an object
  - We want the users to feel the aspect of having luxury car options without the price tag of a luxury car
- Objectives
  - Get an clear and precise output from the sensors and display in on the monitor
  - Expose where we can minimize costs so current device can have the opportunity to be mass produced

Research Challenges
- First decided on the Ultrasonic HC-SR04 because we were blinded by the price. However, we learned that cheap products come at a price. These sensors functioned very poorly with inconsistent data and the Arduino had trouble reading data from them
- Parking sensors designed by car manufactures today can not operate on an Arduino. Therefore, we had to find and test different types of devices that output and receive a radar signal
- Being able to display a outline of a car on the Arduino display while displaying the area of of the object that could be a potential collision
- The Arduino only supports 1 5volt source and 2 grounds and the display pulls most of the voltage from the Arduino. However, 8 sensors needed 5 volts and grounds to operate correctly

Methodology

Hardware
- Arduino was used to process signal received from sensors to collect distance
- SeedStudio Ultrasonic Range Finder sends out and receives frequency
- A buzzer is used to audibly alert the driver of a possible collision

Results
- We are successfully able to pull data(time) from the sensors and convert it into distance
- The data does successfully display a visual to the user when parking
- The buzzer buzzes more rapidly as the driver gets closer and closer to an object

Further Discussion:
A system like this doesn’t have to be only for personal vehicles. While this is a nice luxury for personal vehicles, its also a great opportunity for the construction industry. Construction vehicles are huge and tough to judge. This system is perfect for the experienced and inexperienced drivers

Cost
- Arduino plus display: $65
- Sensors: $120
- Buzzer: $5
- Wires: $15
- Breadboard : $5
- Total: $210
- This cost is for just a prototype. We estimate that mass production can reduce the cost to $134

References