A Low Cost Parallel Parking Guidance System Using Ultrasonics

Nasteff, Madison

The problem to be solved is current parallel parking assist systems are too expensive and not accessible for all cars to use. The purpose of the experiment is to create a low cost and, eventually, universal parallel parking attachment. Thirty-one percent of drivers surveyed by Harris Interactive reported the preference to avoid parallel parking due to the driver's inability to successfully parallel park. In addition, current parallel parking assist devices prove to lower the stress levels of drivers while parallel parking. However, the big question is if the parking assist is worth the price. Using low cost ultrasonic transducers and a simple Arduino control system, this stand-alone accessory is more convenient and more practical than current systems. Now, inexperienced parallel parking drivers will no longer question the ability to successfully parallel park. The driver simply follows instructions given, and the device guides the driver into the parking space. In the first phase of testing, the transducers were wired throughout the car, with the hope of transitioning to wireless communication in further years. The next barrier was the usage of the ultrasonic readings to decide when to instruct the driver to take the next step in the parallel parking process. Creating a multi-step driving coordination required a large knowledge of programming, and much research was conducted to write the program. The final step was to measure the accuracy of the device. In sixteen different trials, the car was able to successfully parallel park almost identically each time, and these results were validated with a tolerance interval test. With a device that, at only $88.91, is thousands of dollars cheaper than those currently on the market, this project successfully completed the goals.

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