

Project Number: 47

Project Title: Real Time Lane Tracking, Collision Avoidance, & Object Recognition

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Abstract:

Over the past several years it has become apparent that self-driving cars will lead the future. Technology and car companies are conducting crucial research into this field and concluded that full autonomy is only achievable through a combination of systems and sensors. Sensors include image sensors, radar sensors, and lidar sensors to achieve lane tracking, collision avoidance, and object recognition capabilities. Our project's aim is to accomplish these three capacities via a camera and an ultrasonic sensor and implement them on a miniature car. A Raspberry Pi will process the inputs and give outputs to an Arduino which will be used to control the RC car. Lane tracking and object recognition will be relying on a camera module. The camera feeds live images into the Raspberry Pi which uses OpenCV libraries in junction with a neural network to control the vehicle. Collision avoidance will be relying on the ultrasonic sensor. The ultrasonic sensor supplies data of surrounding objects to the Raspberry Pi which will use a distance algorithm to decide if and when the RC car should come to a stop. Each system presents its unique challenges, but we believe that we can adequately create a scaled down autonomous vehicle by implementing these systems.