Preventing Left Turn Road Accidents Using Photosensory Technologies and Computer Vision

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In the United States, a large percentage of accidents directly result from “blind” left turns made by drivers who have their view of oncoming traffic blocked by larger vehicles. An engineering solution was created to prevent left turn road accidents on yield signals using Computer Vision. After consulting with Plano Traffic Management, the researchers were able to set parameters of their project to achieve optimal results. First, local traffic patterns were captured using Raspberry Pi Camera on intersections for testing. By programming for vehicle recognition and detection, the researchers were able to conclude their first step in validating their engineering goal. In order to achieve peak accuracy in detecting vehicles and lanes, the scale factor for which the Raspberry Pi zoomed to capture an image was adjusted. A scale factor of 1.03 was the most accurate through eight trials in recognizing vehicles at 94% accuracy and lanes at 100% accuracy. Next, the researchers needed to broadcast this information to drivers. This was done using an LED matrix display board, which signaled to drivers the presence or absence of vehicles and lanes they were located in at 100% accuracy. When testing finished, the engineering goal was validated as the Raspberry Pi was able to instruct the LED display to show drivers oncoming traffic and the lane in which the vehicle was in. From there, drivers were able to make an informed decision on “blind” left turns to minimize the potential for a devastating accident.

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