ECE-411 Homework #2 –Decision Matrix

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**Motorcycle Rear Proximity Sensor**

Objective

The objective of this unit would be to give a motorcycle rider a visual indication of how close a vehicle is to the rear of the bike. A simple display will be mounted near the speedometer (or anywhere in peripheral vision of rider’s choice) will light up dependent on proximity of the rear-coming vehicle allowing the rider to make decisions based on proximity and traffic density.

Motivation

With the popularity of the vintage motorcycle and café-racer movement, a lot of riders are finding themselves with rear-view mirrors that are mounted to the end of the handlebars. These tend to vibrate with engine revolution and road conditions making it hard to get any easy visual accuracy in them. They are basically there for legality. Also, based on traffic density and conditions, motorcycle riders make certain decisions on positioning within the lane and emergency maneuvers. This can be tricky when a vibrating rear-view mirror is the rider’s only reference. Our sensor assembly would be an invaluable tool to aid a rider in making important decisions based on the proximity of the vehicle directly behind them.

Description

The complete package will be made up of three separate units. The indicator display that mounts within the rider’s front-low peripheral vision, the microprocessing unit, and the sensor assembly. The initial thought is that the microprocessor will mount under the seat (one of the safest places on a motorcycle) and the sensor will mount on the rear body plastics or license plate holder. Power will be drawn from the motorcycle battery, filtered, and regulated to the proper usable voltage. Processing will be done with a simple microcontroller unit. The rear sensor will send the proximity data to the microprocessor which will light up the display accordingly.