ECE-411 Homework #3 –Project Requirement Specifications

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Motorcycle Proximity Sensor

* Must
  + General Functionality
    - Communicate to the user how close an object is behind them in three stages: far-range, mid-range and close-range. (Far-range is defined as 10 feet to 15 feet away. Mid-range is defined as 5 feet to 10 feet away. Close-range is defined as 0 feet to 5 feet away.
  + Electrical requirements
    - Use an array of LED’s to communicate distance of the object – 1 LED for Far-range, 2 LED’s for Mid-range, 3 LED’s for close-range
    - Be capable of illuminating the LED’s enough to be seen in the daylight.
    - Process input from an ultrasonic sensor.
    - Be powered off a 12V lead-acid battery.
  + Physical Requirements
    - Fit on the gas tank or handlebars of a motorcycle and be in peripheral vision of the operator.
    - Be able to withstand the vibrational stress of being placed on a motorcycle, that is, the device and the ultrasonic sensors must not fall off the motorcycle.
* Should
  + General Functionality
  + Electrical requirements
    - Use an array of different colored LED’s: Green for far-range, yellow for mid-range and red for close-range.
    - Have a brightness switch to change from day or night settings.
    - Be powered off a 12V lead-acid battery OR external battery pack.
  + Physical Requirements
    - Be easy to remove from the motorcycle.
* May
  + General Functionality
    - Communicate to the user how close an object is to their left and right side
  + Electrical requirements
    - Use an array of different colored LED’s that is two LED’s thick, that is, each distance stage is represented by two LED’s instead of one.
    - Have a brightness adjustment knob for variable brightness.
  + Physical Requirements