Project 1: Detect lane markings in movie files  
Due: September 28 11:59 PM

Assignment: In this project, you build a vision module of an autonomous car with Matlab. The vision module should detect lane markings (center and border lines). To help your preprocessing steps, we extracted three groups of images (30 jpg files per a group) http://reason.cs.uiuc.edu/cs440/urbanchallenge/project1/capture.tar

from two movie files that are captured at Urbana, IL (Lincoln avenue and Windsor Road)  
http://reason.cs.uiuc.edu/cs440/urbanchallenge/project1/Champaign_capture.mov  
http://reason.cs.uiuc.edu/cs440/urbanchallenge/project1/Champaign_capture2.mov

The task is (1) to find the regions of lane marking in the input images (90 jpg files) and emphasize the areas (the lane markings), and deemphasize other areas (2) to find 4 lanes that are closest to the car. Please output your result as image files (bmp or jpg).

You may use whatever algorithms you want including Hough Transform, other edge detectors (Morphological Gradient and Laplacian, Linear & Non-Linear Scale-Space etc), and Color or Textual filters (Please refer to the text book or use Google for detailed information). In the color filter, you may assume specific lighting conditions (e.g. a specific yellow color for center line and a specific white color for the boundary line). In addition, you may use the Matlab modules that are built by other universities or research groups (not including the other groups in CS 440), if you correctly state that you use their code.

You do not need to process movie files and to reason between two (or more) consecutive images.
Evaluation: The performance of your module is measured by the sets of output images that you submit and your report that includes your methodology, the brief introduction of algorithms that you use, and discussions of your results. The output images should contain the following:

(a) A proper center line of two lanes which are the closest to the car (most important)
(b) 4 lanes that are closest to the car.
(c) Emphasized lane markings areas and deemphasized other areas.

Different approaches to get better performance. In addition, we'll evaluate your code against our test sets (beyond the given sets).

By the due date, please submit your report and output images at compass http://compass.cs.uiuc.edu/

Please present your result images at your team web page.