Project no. 5A (2 persons)

Vehicle recognition by the MAP estimation, based on a 3-D generic object model.

To design and implement a MAP estimation for 3-D vehicle recognition, based on its 3-D generic model, that represents the front view of a car. Assume a cycle of following steps: hypothesis prediction, projection to the image plane, matching with image segments, hypothesis update.
Particular steps are required

1. (P1) Provide image input and output functions from / to image files. Perform the edge image detection, line segment detection and colour region detection steps. Show the results in a graphic window (with the original image in the background).
2. (P2) Provide the model observation function – the best match between model edges and a set of edges in the image with respect to the colour regions. Draw the projected and matched edges in a graphic window (with the original image in the background).
3. (P2) Design and implement the model projection function and the iterative gradient minimisation process required for the MAP estimate.
4. (P1,P2) Make a 3-D wire-frame model design – consider a simple shape and simple motion parameters.
5. (P1,P2) Make test runs. Prepare a final report.