ELE8700 / ELE800: Project Design 2004/2005

Topic:

Student name:		*E-mail:*
Student name:		*E-mail:*
Faculty lab coordinator:		*Faculty advisor: Lev Kirischian*
Estimated cost: $ 250	*Project rating: Complex*	*Date:* September 2004

Title: **MOBILE ROBOT WITH ROAD SIGNS RECOGNITION SYSTEM**

Preamble:
Most of recent mobile robots need to have complex and costly navigation system based on GPS or gyroscopes based navigation platforms. Instead most of animals are navigating using environmental image recognition. Thus, it may be a promising idea to make navigation system for a mobile robot based on signs or simple figures drawn on a surface (e.g. floor of a factory or road between buildings). In this case robotic navigation system should be based on video recognition of these signs or figures to interpret them as guidance instructions.

Objective:
Develop the navigation system based of road signs recognition for the mobile robotic platform.

Partial specifications:
This project consists of two parts scheduled for two students:

1. Video-acquisition & recognition system based on digital CMOS-camera and embedded RISC-controller,
2. Mobile robot with RISC-controller-based embedded control system.
    - Apply PIC 16F877 RISC controller for video-processing and control system,
    - Use CMOS-camera with embedded video A/ D converter,
    - Implement stepper motors as actuators.

Suggested approach:

- Conduct literature survey on video-recognition algorithms and RISC controllers,
- Develop algorithms for road video-recognition and robot positioning,
- Built the electro-mechanical platform,
- Design robotic control system based on Microchip RISC-controllers and implement video-recognition and positioning procedures.