ELE700 / ELE800: Project Design 2004/2005

Topic:

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Estimated cost: \$ 250	Project rating: Average	Date: September 2003

Title: ROBOT-NURSE WITH VIDEO-MONITORING SYSTEM

Preamble:

In the hospital environment, for seniors and disabilities it is very important to have the mobile robot with Voice-Interactive Control system (VIC) and Video-Monitoring system. This robot can come to patient, automatically finding correct direction to person asked for assistance. Robot can deliver meal, drinks, necessary medicine etc. It can control medical devices / instruments using embedded adaptive IR-controller and allow medical personnel to watch patient via wireless video-monitoring system. Robot should allow patient to contact service personal and request assistance when necessary.

Objective:

Develop and design the mobile service robot with voice-interactive control system. This robot should adapt for the user voice instructions, learn answering messages associated with each instruction, and find the direction to a person and associate voice instructions with respective action: motion, device control, transfer voice messages, telephone calls, etc. Robot should be equipped with wireless video-monitoring system and wireless PC-interface.

Partial specifications:

This project consists of two parts scheduled for 2 students:

- 1. Static: Voice-interactive control system near patient with RF-communication to Central nursing station and PC-based Central nursing station
- 2. Mobile robotic platform with microcontroller-based local control system, infrared controller and wireless video-transmitter.
- Use DSP-chip "VoiceDirect TM" by Sensory Inc. for voice recognition;
- Use Microchip PIC 16F877 RISC-controller for embedded control system of the robot;
- Use message record and playback chips for voice-answering subsystem;
- Apply embedded RF-transceivers for voice-control system and mobile robotic platform.
- Implement video-monitoring system on a base of wireless CMOS video-cameras.

Suggested approach:

- Conduct literature survey on voice-interactive systems and RISC micro-controllers;
- Develop detailed specifications and hardware/ software strategies.
- Design electrical schematic diagrams and software procedures;
- Built and test the prototype mobile robot and PC-based central station.