EECS 373 Final Project Proposal: Kinect Car

Section 1: High Level Description

Our preliminary idea is to interface with an Xbox Kinect and use it to direct a remote controlled car. The ‘driver’ will stand facing the Kinect using specific arm and hand gestures to indicate at least speed and direction (potentially adding camera, lights, Nerf launcher to the action library.... if time allows). The data from the Kinect will be ported through a specific action library we define and those commands transmitted to the car via RF using two Xbee chips. The car might also have on board collision sensors, to override user control in the event of an imminent crash. This could be in the form of variable resistors on the car (to indicate a crash has happened), sonar sensors (to prevent possible crashes), or both.

The major functions of the project are as follows:
1. Develop our own interface library to the Kinect by defining and enumerating specific gestures.
2. Create software that can interpret these actions and send them to the car.
3. Design a receiver that can pick up and interpret this RF data which is then sent to control the various functions of the car.

I/O:
Inputs: Kinect, variable resistors/sonar sensors, on board camera

Outputs: Car driving wheels (2), pivot wheel, on board camera servos*, lights*, Nerf launcher*

* Indicates that components are additional output features and not at the core of the project

Section 2: Functional Diagram
Section 3: Component Diagram

Section 4: Component List

Stock:
- Car
- LEDs
- SmartFusion Board

Non-Stock:
- 1 Wireless Camera and receiver
- 1 Camera Pan and tilt servo system
- 1 USB Video Interface
- 2 XBee Wireless Communication Chips
- 1 Nerf Launcher
- 1 Xbox Kinect