EECE 4712/6712 Embedded Systems

Assignment 2: UML

Problem 1 (50%)

Assume that you are leading a team that is assigned to design a remote-controlled robotic humanoid system. The system is composed of two distinct units: a robotic unit (hardware/software) that can move freely on a set of wheels, and the remote control unit (e.g. a smart phone app). The two units communicate via a wireless link. The minimum requirements for the robotic unit are:

- *Basic Movements*: Move Forward, Move Backwards, Turn Left, Turn Right, and Wait
- *Basic Human Machine Interfacing* (HCI): Greet when turned on, Transmit video from a WebCam to the remote–control unit for real-time monitoring.

Provide the following in terms of UML:

a) A minimal list of ***Structural Things*** required for the system to be operative

b) List three ***Use Cases*** for the system

c) Draw the following UML diagrams:

1. Class diagram
2. Deployment Diagram
3. Use case diagram (corresponding to 1b)
4. State Chart Diagram space (at least three corresponding to b)
5. Sequence Diagram (corresponding to 1b)

Problem 2 (50%)

You are to design an embedded system of the elevator system at the Engineering Science Building. The building has 3 floors, where each floor can have a maximum of 2 buttons: up and down. Inside the elevator, the user has a choice to select the destination floor and to open or close the door. The light and the fan of the elevator should be automated to turn on only when occupied.

Complete the following for this problem:

a) A list of things (components) and a list of use cases for the system.

b) Generate the following UML diagrams:

- Class Diagram
- Component Diagram
- Deployment Diagram
- Case Diagram
- Interaction Diagram
- Collaboration Diagram
- State Chart diagram
- Activity Diagram