Exercise – Use Cases

Form a team of 2 to 4 students.

System to be developed:

You have been hired to develop a software system for motion detection and garage door control. The system should turn the garage door lights on automatically when it detects motion within a given perimeter. The garage door opener should be possible to control either by a remote radio transmitter or by a manual button switch. The opener should include the following safety feature. An “electric eye” sensor, which projects invisible infrared light beams, should be used to detect if someone or something passes under the garage door while it closes. If the beam is obstructed while the door is going down, the door should not close—the system should automatically stop and reverse the door movement.

The relevant hardware parts of the system are as follows (see Figure 1):

- motion detector
- external light bulb
- motor for moving the garage door
- “electric eye” sensor
- remote control radio transmitter and receiver
- manual opener button switch

Figure 1: Problem domain for the motion detection and garage door control system.

Assume that all the hardware components are available and you only need to develop a software system that controls the hardware components.

(a) Identify the actors for the system and their goals
(b) Derive only the use cases relevant to the system objective and write brief or casual text description of each
(c) Draw the use case diagram for the system
(d) Write a detailed use case description for one of the following use cases:
   - the use case that deals with the remote-controlled garage door opening
   - the use case that deals with the auto-reverse function in case the door is closing and someone/something passes under the door
   - any other use case you find more interesting