COLLISION AVOIDANCE

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Case Study

Specification (from the client):

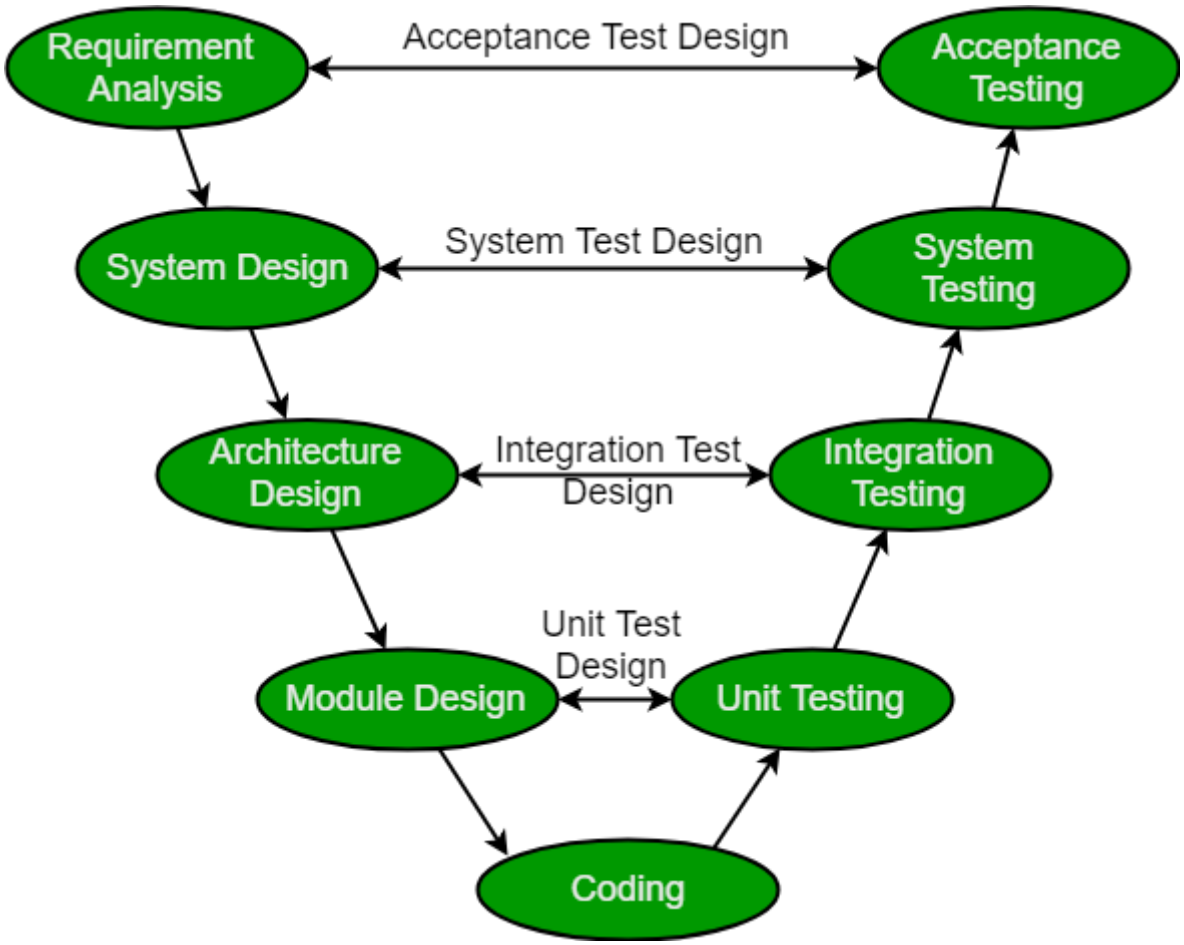
A system to protect the car from hitting object while driving.

System Assumptions:

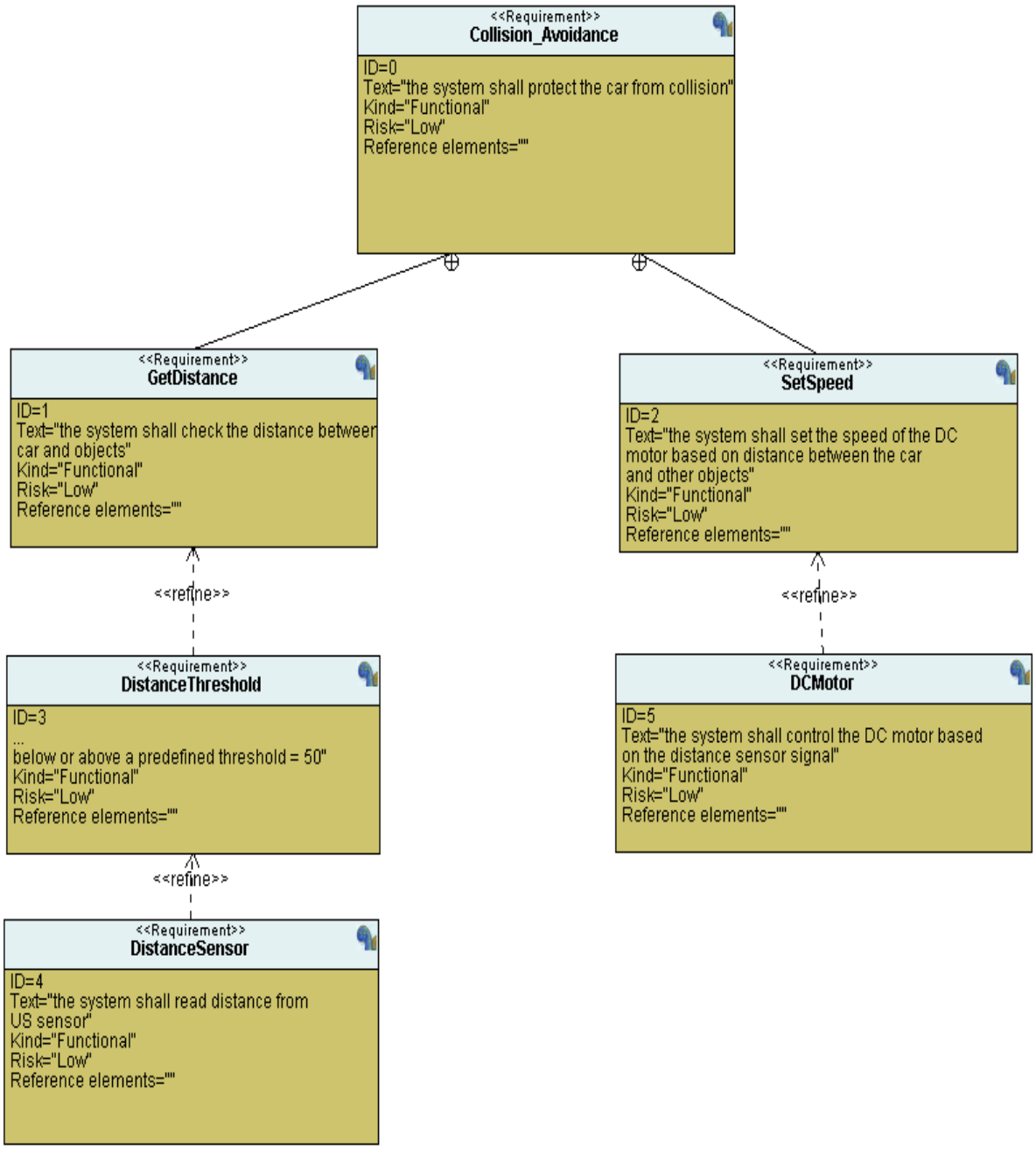
- The ultrasonic sensor never fails.
- The DC Motor never faces power cut.
- The controller never faces power cut.
- The controller maintenance is not modeled.

Method

The V-model is a type of SDLC model where process executes in a sequential manner in V-shape.

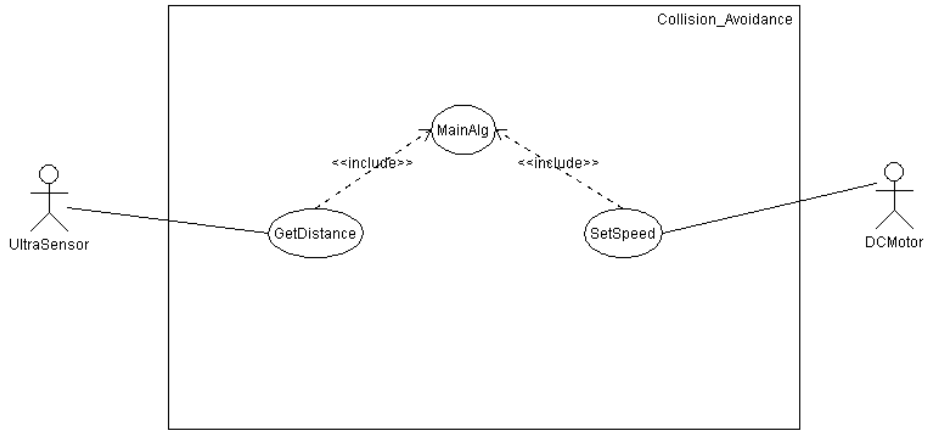


Requirements

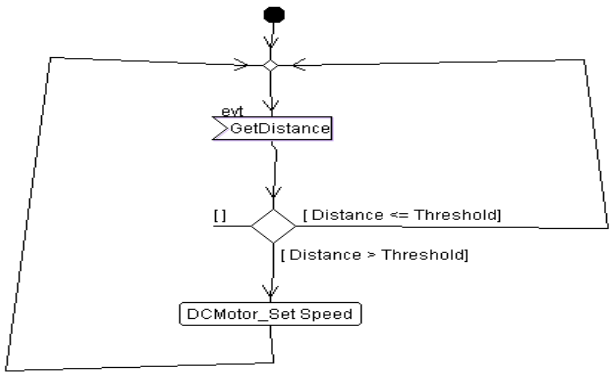


System Analysis

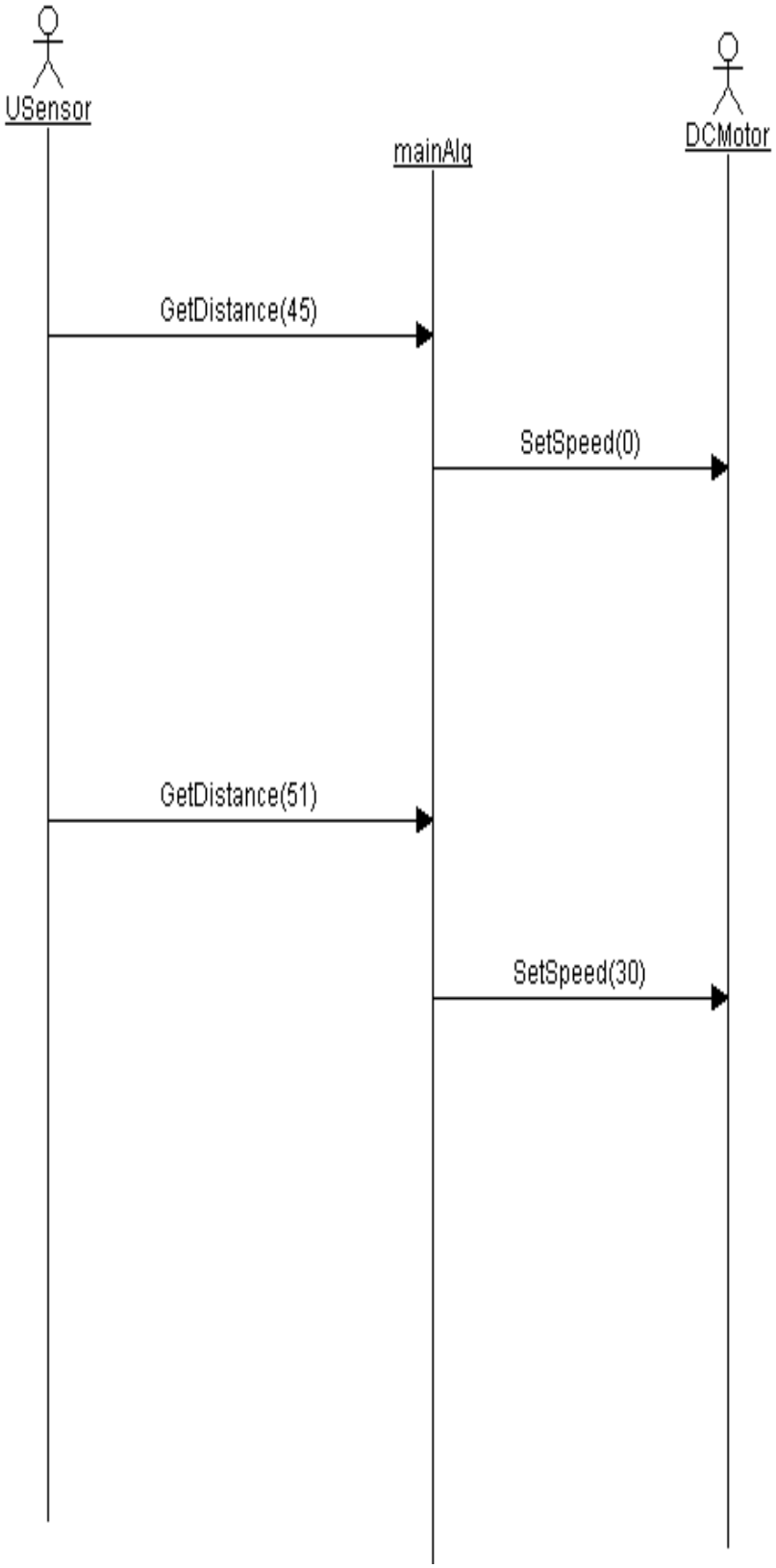
Use Case Diagram:



Activity Diagram:

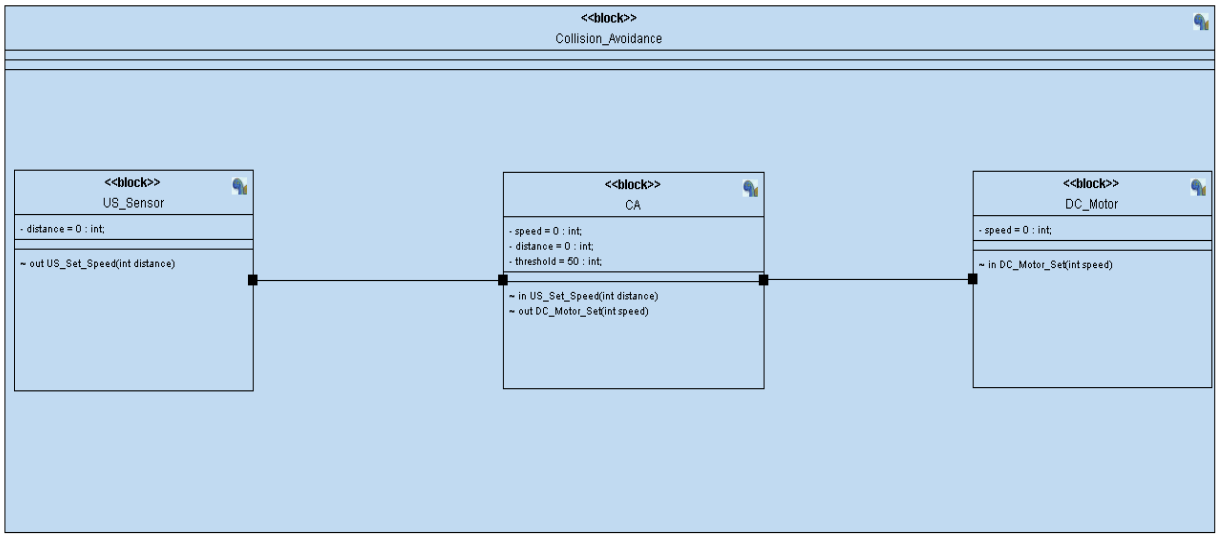


Sequence Diagram:



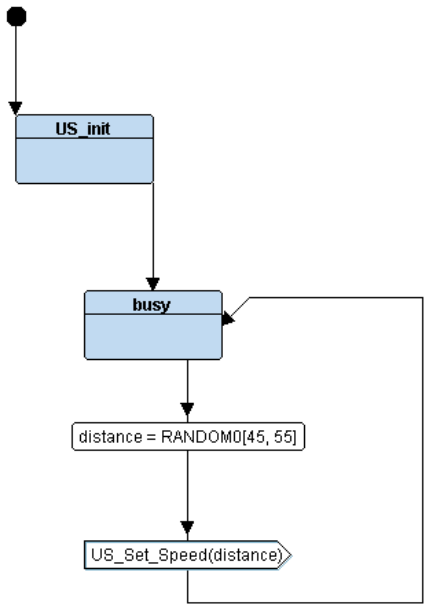
System Design

Block Diagram:

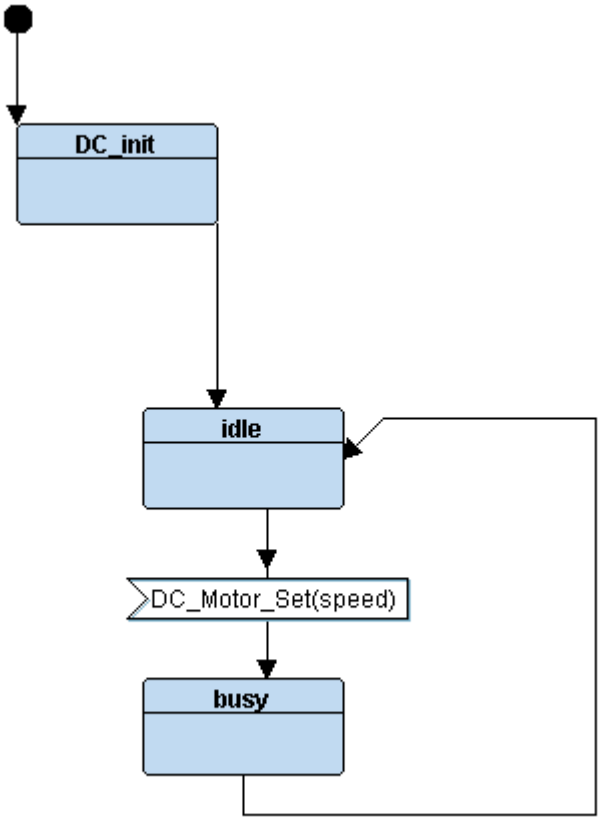


State Machines

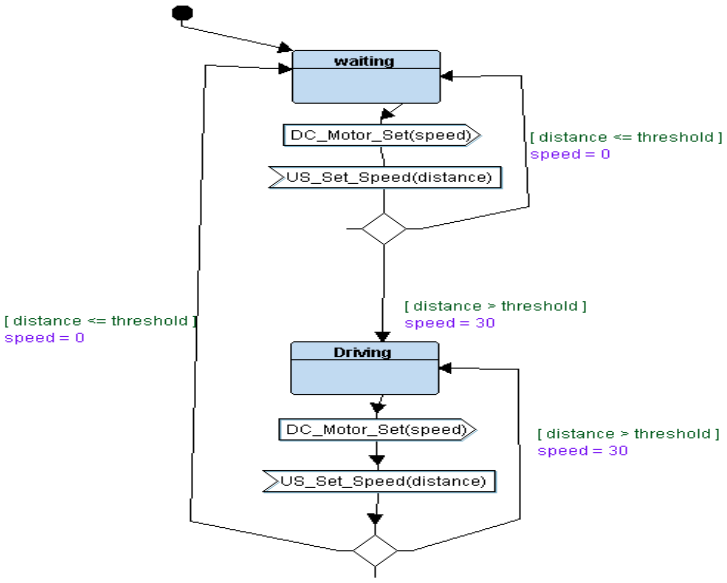
US_Sensor:



DC_Motor:


DC_init
idle
DC_Motor_Set(speed)
busy

CA:


waiting
DC_Motor_Set(speed)
US_Set_Speed(distance)
[distance <= threshold]
speed = 0
[distance > threshold]
speed = 30
[distance <= threshold]
speed = 0
Driving
DC_Motor_Set(speed)
US_Set_Speed(distance)
[distance > threshold]
speed = 30