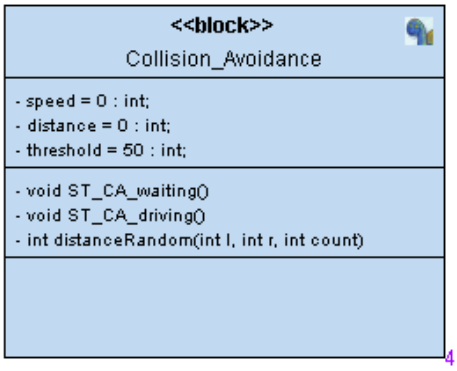
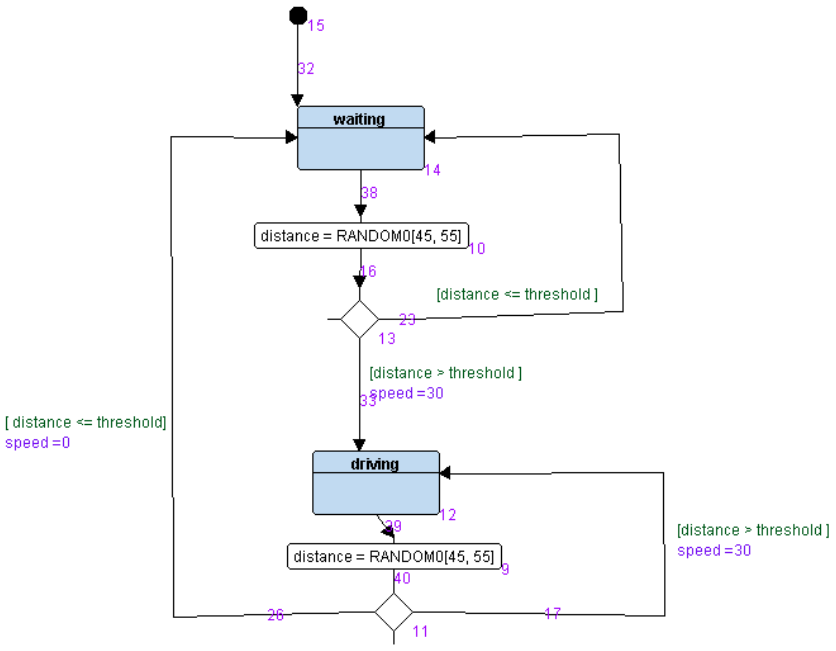
State Machine design

Using one model:-

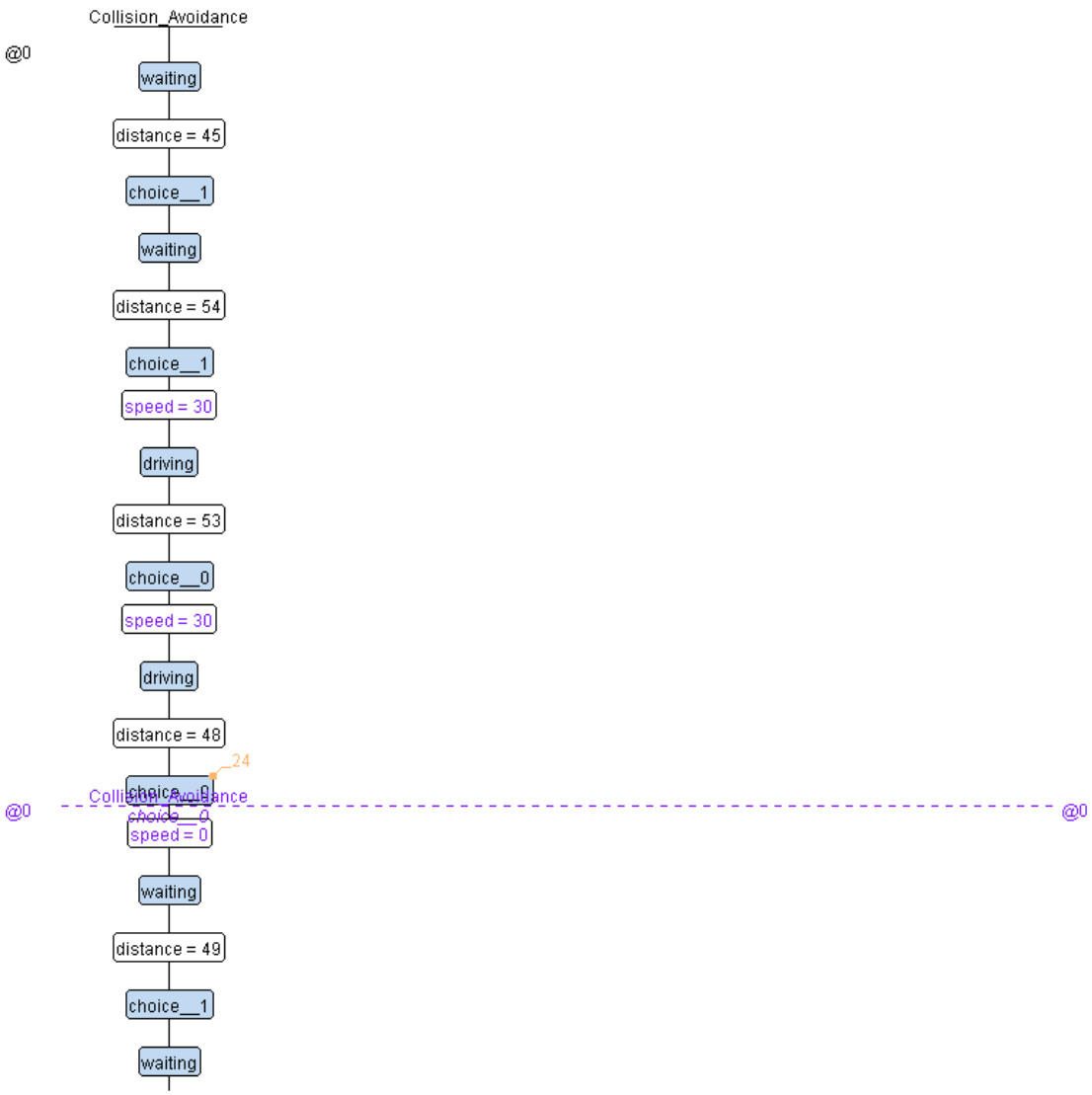
- Designing a simple collision Avoidance system to use state machine for implementation
- Starting from waiting state and switching to driving state if distance is higher than threshold which is 50 in our case



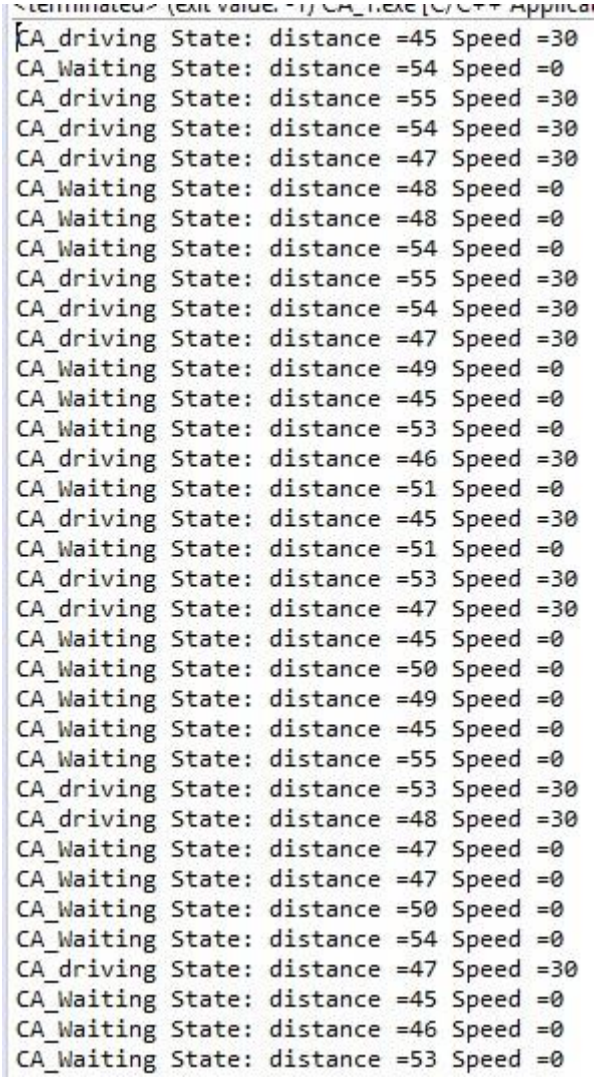
- Flow of implementation



- Simulation result



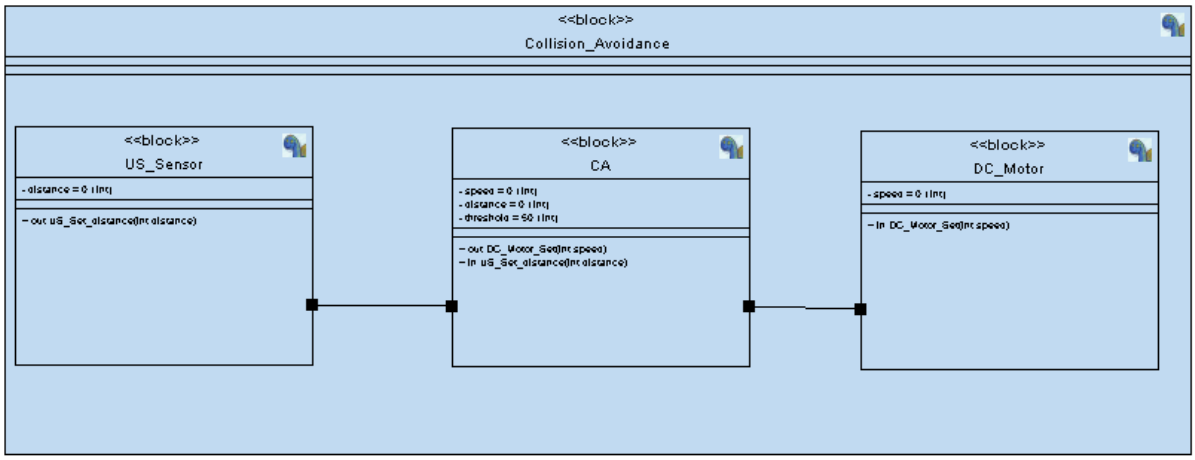
- Implementation with C



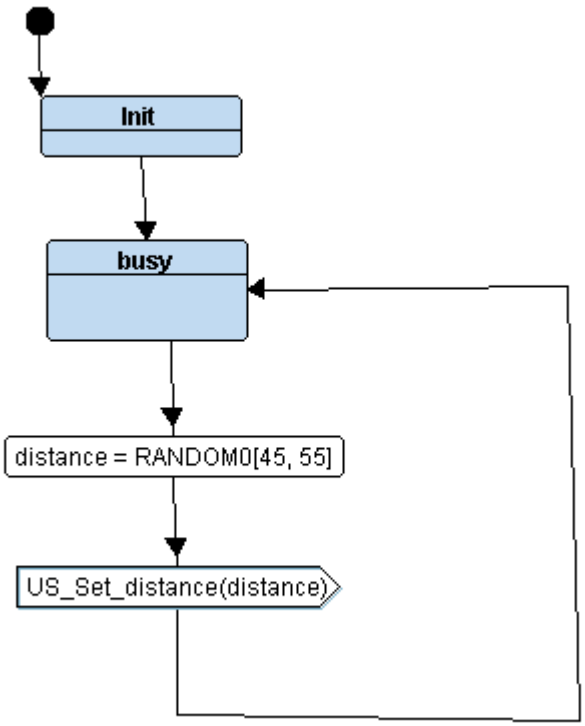
Codes Can be found in the Repo

Using multiple models

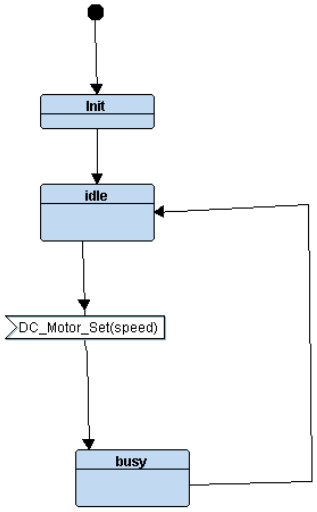
- Here we implement using 3 models , one for CA program, one for US sensor and one for DC motor



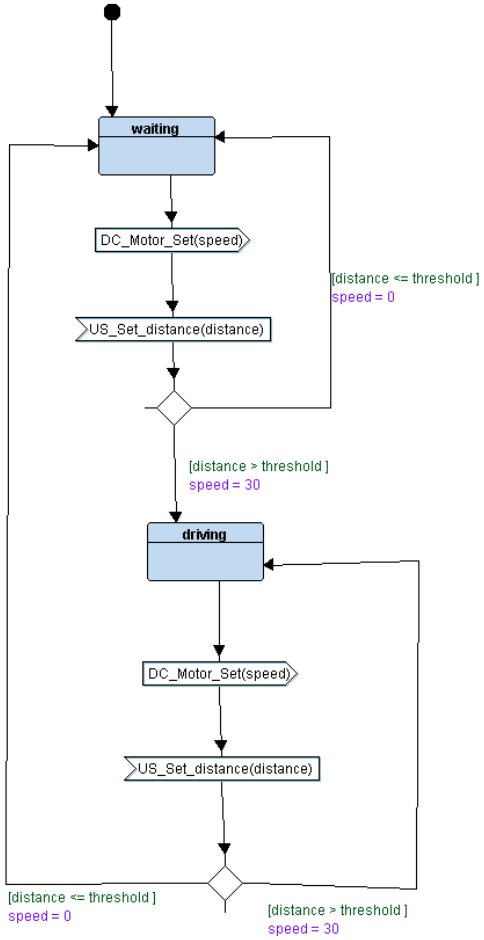
- US diagram



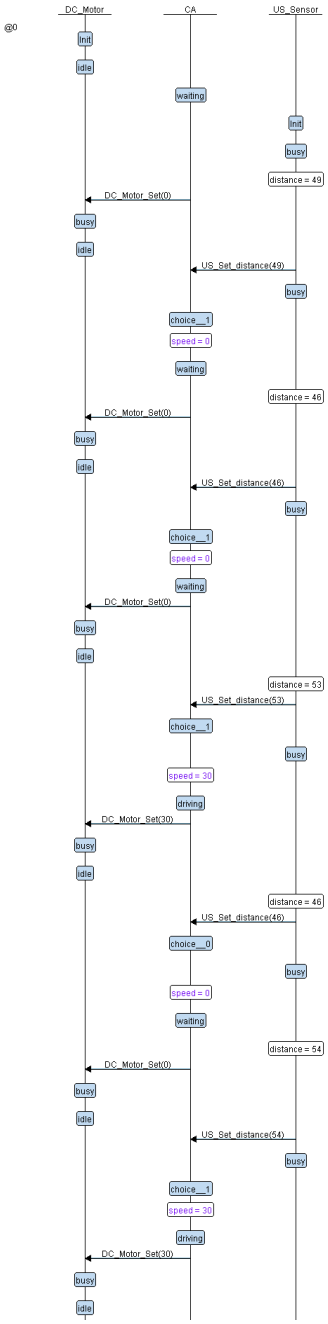
- DC diagram



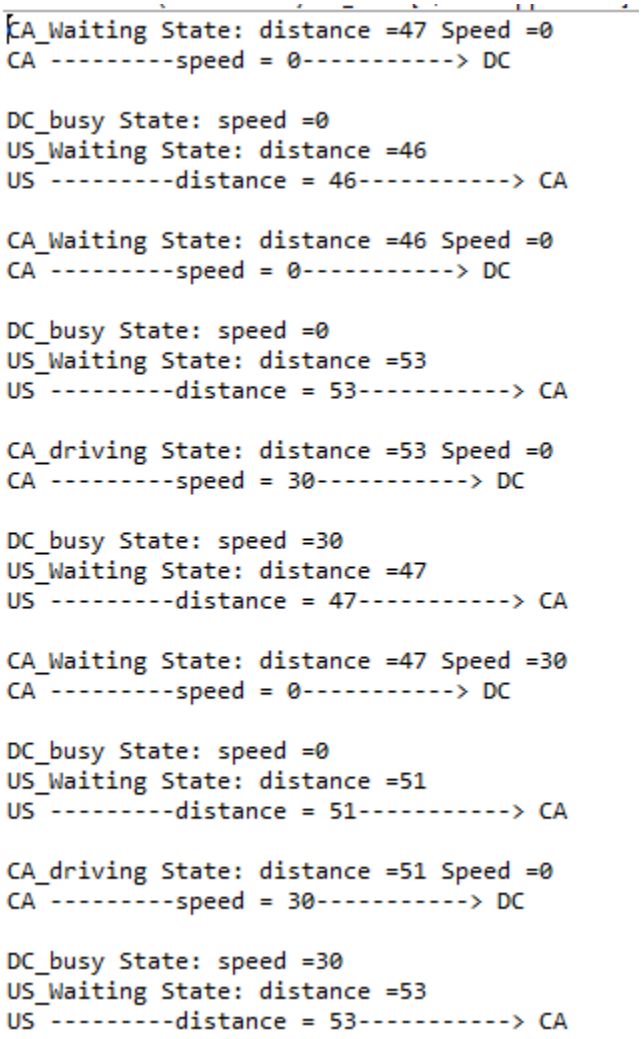
- CA diagram



- Simulation


DC_Motor
CA
US_Sensor
@0
init
idle
waiting
init
busy
distance = 49
DC_Motor_Set(0)
busy
idle
US_Set_distance(49)
busy
choice__1
speed = 0
waiting
distance = 46
DC_Motor_Set(0)
busy
idle
US_Set_distance(46)
busy
choice__1
speed = 0
waiting
DC_Motor_Set(0)
busy
idle
distance = 53
US_Set_distance(53)
choice__1
busy
speed = 30
driving
DC_Motor_Set(30)
busy
idle
distance = 46
US_Set_distance(46)
choice__0
busy
speed = 0
waiting
distance = 54
DC_Motor_Set(0)
busy
idle
US_Set_distance(54)
busy
choice__1
speed = 30
driving
DC_Motor_Set(30)
busy
idle

- C implementation



```
CA_Waiting State: distance =47 Speed =0
CA ---------speed = 0-----------> DC

DC_busy State: speed =0
US_Waiting State: distance =46
US ---------distance = 46-----------> CA

CA_Waiting State: distance =46 Speed =0
CA ---------speed = 0-----------> DC

DC_busy State: speed =0
US_Waiting State: distance =53
US ---------distance = 53-----------> CA

CA_driving State: distance =53 Speed =0
CA ---------speed = 30-----------> DC

DC_busy State: speed =30
US_Waiting State: distance =47
US ---------distance = 47-----------> CA

CA_Waiting State: distance =47 Speed =30
CA ---------speed = 0-----------> DC

DC_busy State: speed =0
US_Waiting State: distance =51
US ---------distance = 51-----------> CA

CA_driving State: distance =51 Speed =0
CA ---------speed = 30-----------> DC

DC_busy State: speed =30
US_Waiting State: distance =53
US ---------distance = 53-----------> CA
```

Codes Can be found in the Repo