Real Time ball tracker and Goalkeeper

Second Mentor Evaluation

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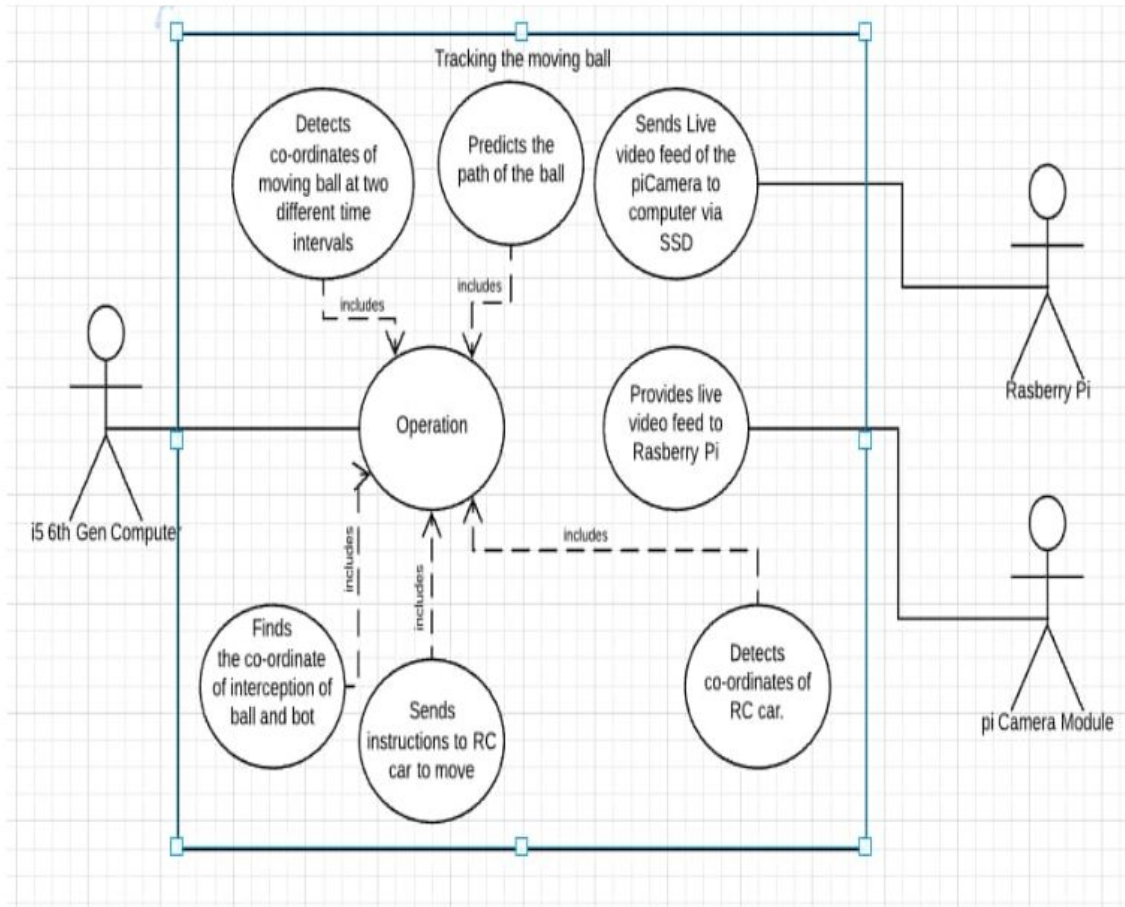

Computer Science and Engineering Department

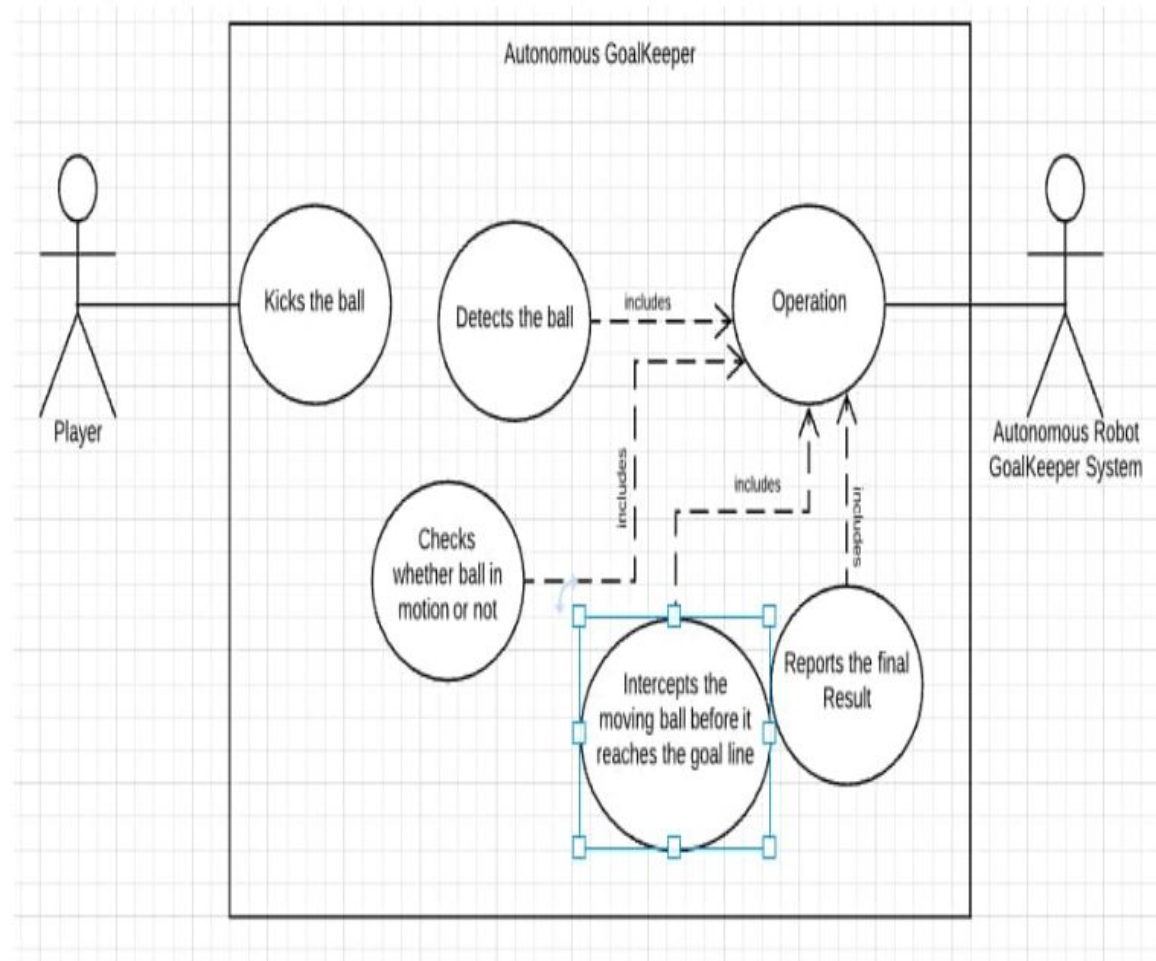**Thapar Institute of Engineering and Technology, Patiala**
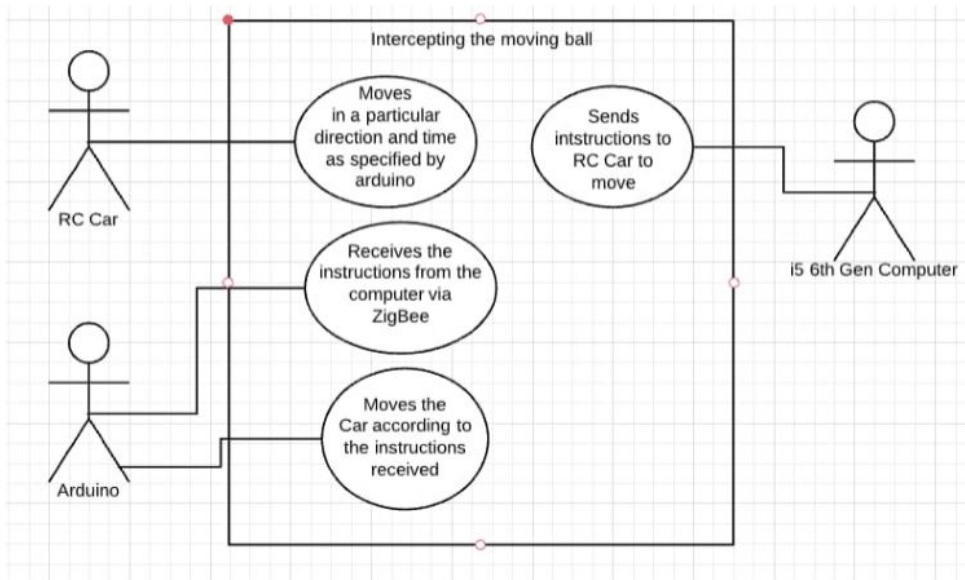
March 2019

Analysis model

Use Case Diagrams

Tracking the ball

Tracking the moving ball

- Detects co-ordinates of moving ball at two different time intervals
- Predicts the path of the ball
- Sends Live video feed of the piCamera to computer via SSD
- Operation
- Provides live video feed to Rasberry Pi
- Finds the co-ordinate of interception of ball and bot
- Sends instructions to RC car to move
- Detects co-ordinates of RC car.

includes

i5 6th Gen Computer

Rasberry Pi

pi Camera Module

USE CASE Diagram #2

Autonomous GoalKeeper

- Player
- Kicks the ball
- Detects the ball — includes → Operation
- Checks whether ball in motion or not — includes
- Intercepts the moving ball before it reaches the goal line — includes
- Reports the final Result — includes
- Autonomous Robot GoalKeeper System

USE CASE DIAGRAM #3

Intercept the moving ball

Intercepting the moving ball

RC Car

Moves in a particular direction and time as specified by arduino

Sends intstructions to RC Car to move

Receives the instructions from the computer via ZigBee

i5 6th Gen Computer

Arduino

Moves the Car according to the instructions received

E-R Diagram

Autonomous GoalKeeper (ER Diagram)

Ball	
Ball_Id	String
Person_Id (F.K)	String
B_Color	String
Initial Position	String
Diameter	Number
Avg Speed	Number

Player	
ID	String
Name	String
Age	Number

1..*   Kicks   1..*

Ground	
Ground_ID	String
Width	Number
Length	Number
G_Color	String

1

Defends

1..*

RC Car	
ID	**String**
Ball_Id(F.K)	String
Ground_Id(F.K)	String
Success	Boolean
Response Time	Float

1..*   Defends On

1

Class Diagram

Sequence Diagram

Sequence Diagram (Autonomous GoalKeeper)

State Chart Diagram

kick the ball

tracking and
anticipating the
landing point

ball in range   ball kicked

instruction to quit

Passing
instructions to the
robot via zigbee to
intercept the ball
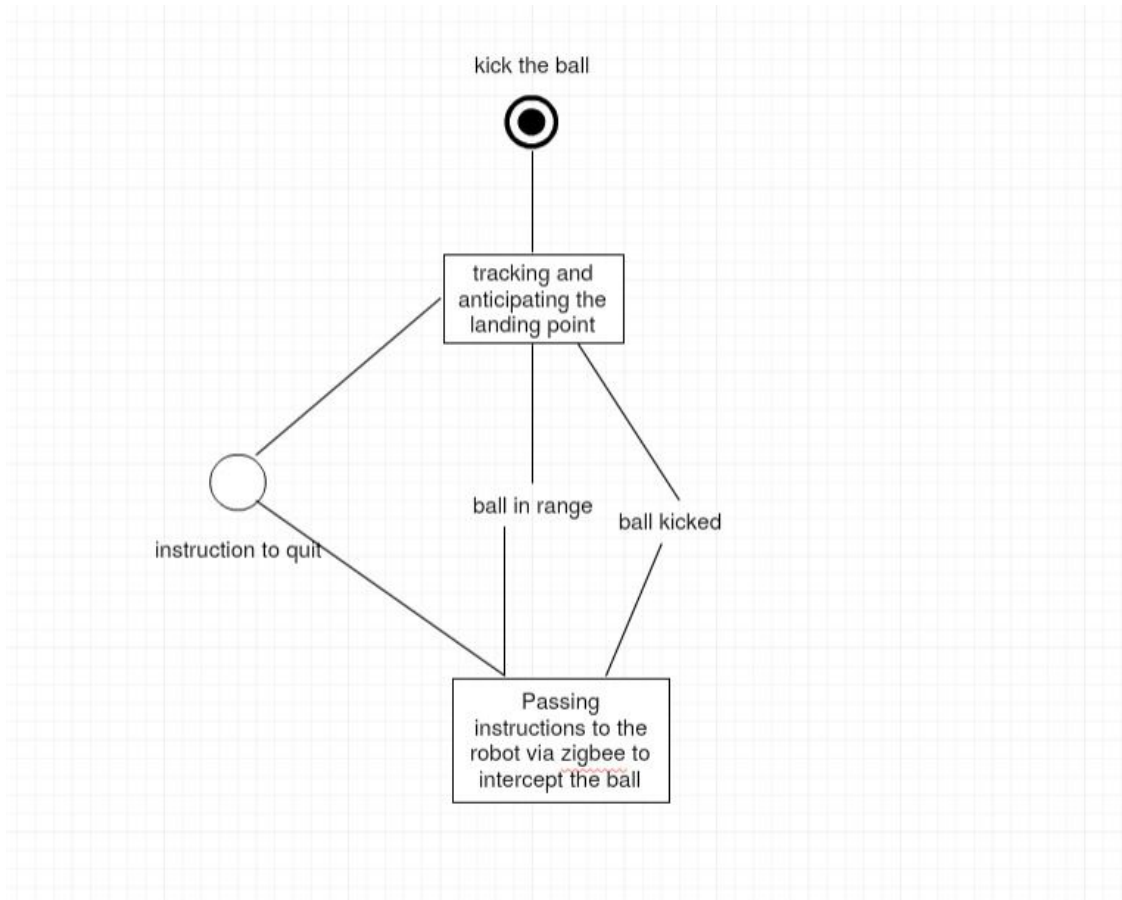
Cost Analysis

- USB-Camera for recording and transferring the feed live – Rs2000

- RC car(required for assembling the goalkeeper) - Rs2000

- Arduino(fitted with Zigbee) for receiving live commands from the Processor - Rs1000

- Zigbee module-Rs980

- Total Tentative cost - Rs5980/-

Design Model

Component Diagram

UML Component Diagram
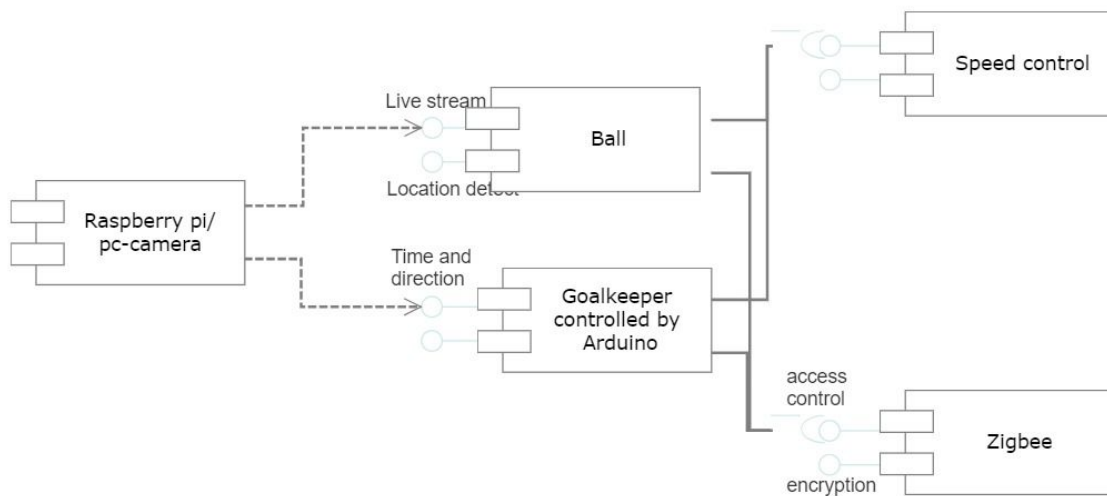
Architecture Design

Context Diagram
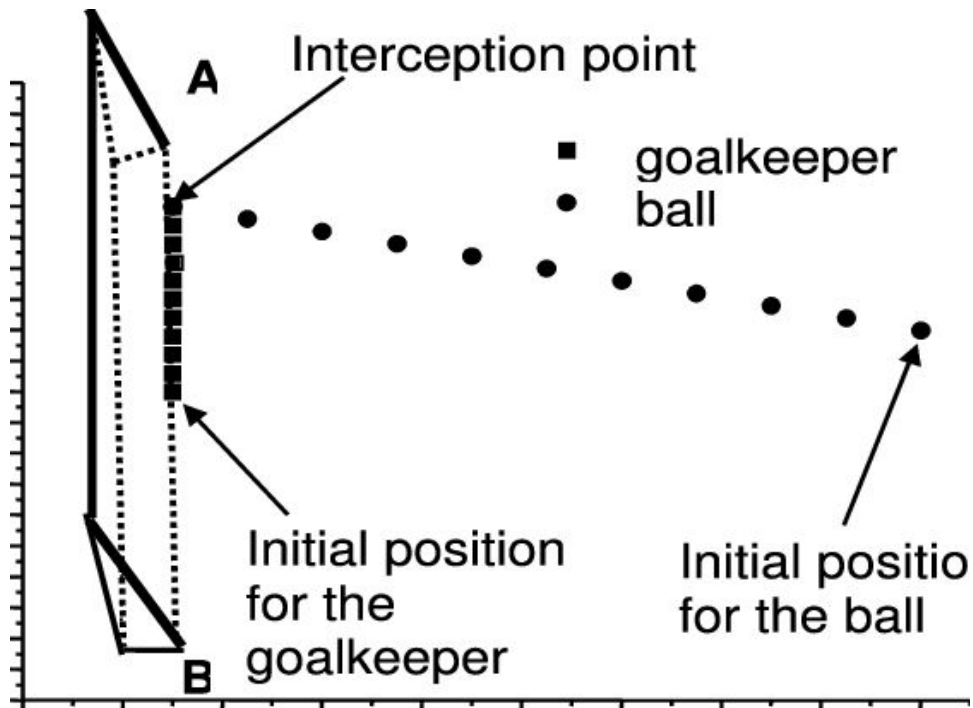
Conceptual Architecture
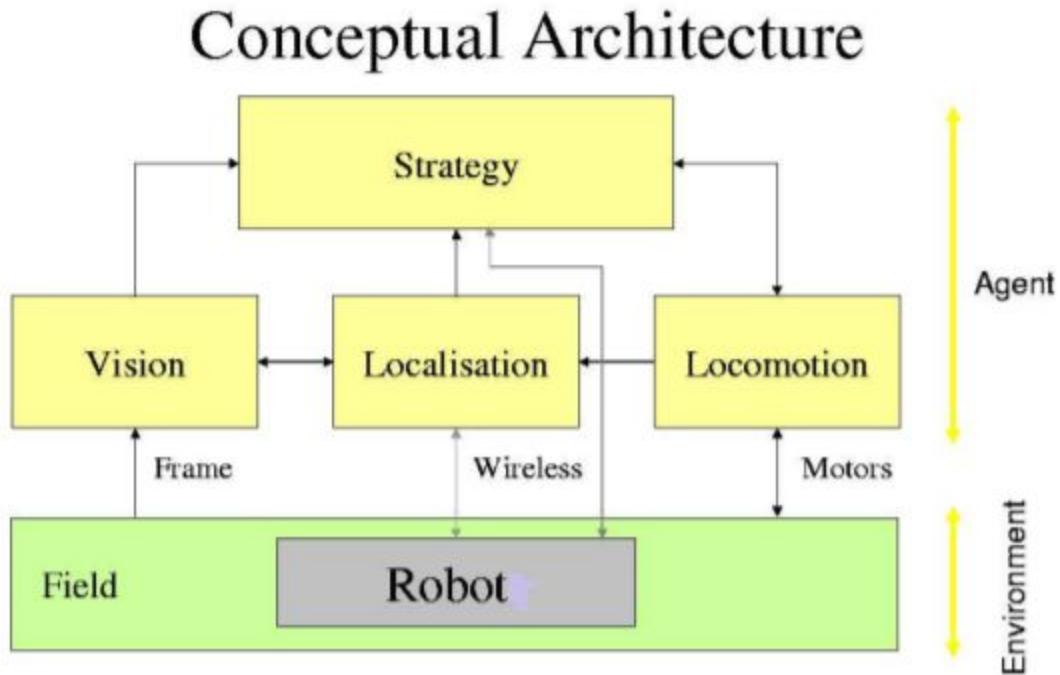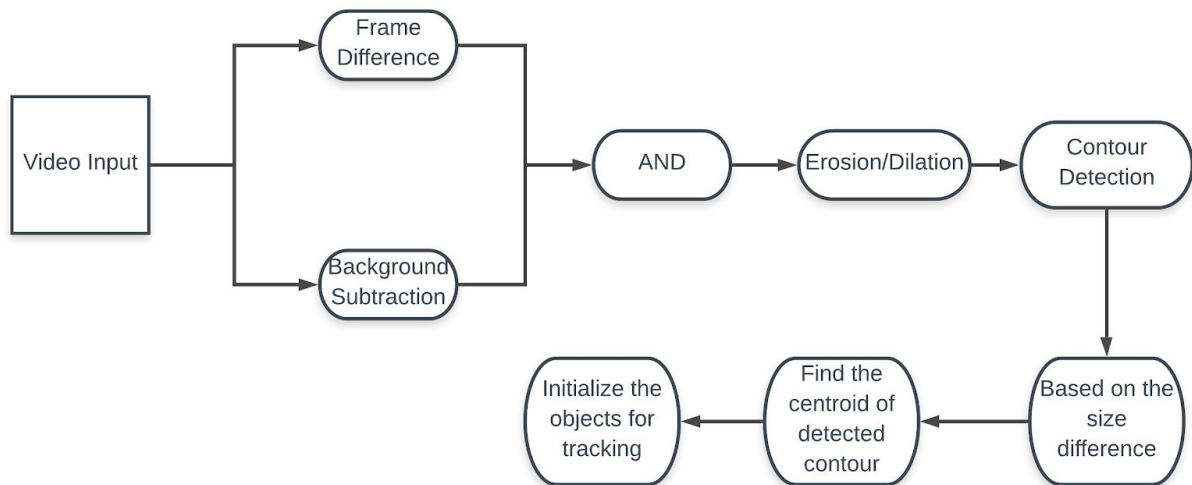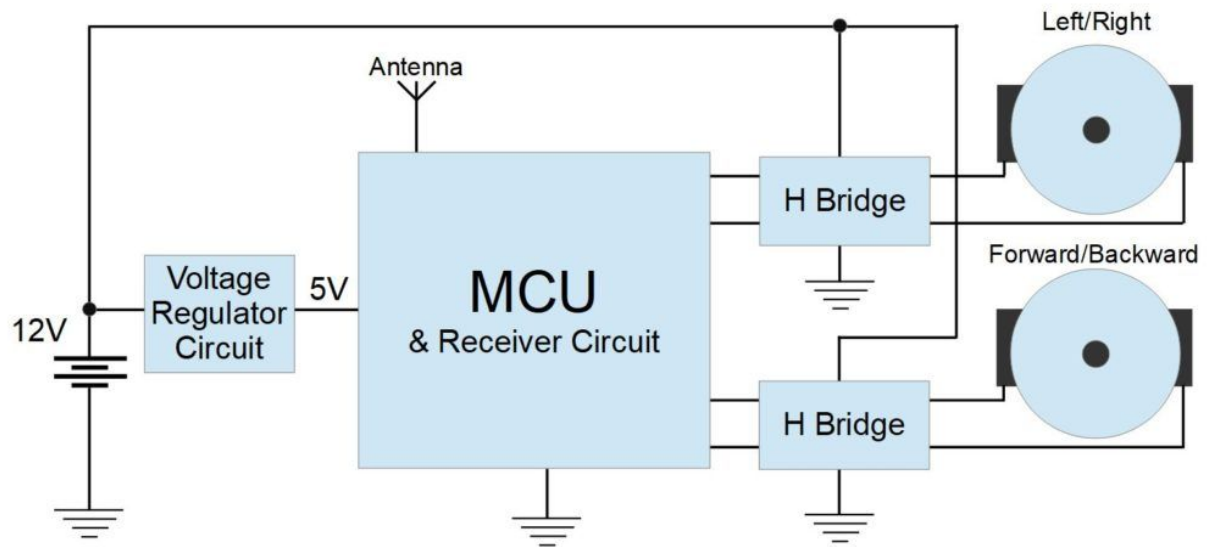

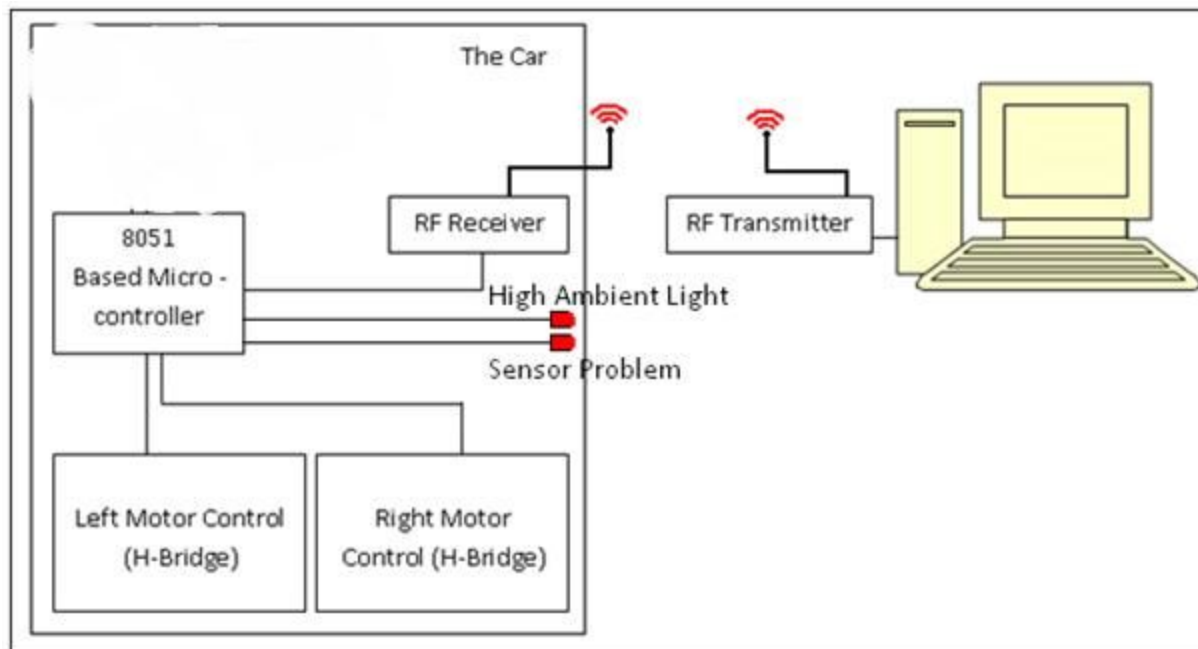## Object Detection Architecture

illustration of architecture for object tracking

Architecture of the moving Bot

Connection Architecture

System Architecture