

# **“Counter Strike AutoPlay Simulator”**

***Mid-Semester Report of  
7<sup>th</sup> Semester Mini Project***

***FOR THE DEGREE OF***

**BACHELOR OF TECHNOLOGY**

***IN***

**INFORMATION TECHNOLOGY**

***BY***

Utkarsh Gupta (LIT2016009)

**UNDER THE SUPERVISION OF**

***DR. VISHAL KRISHNA SINGH***

**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY,  
LUCKNOW**

**September, 2019**

**Supervisor's Signature: \_\_\_\_\_**

# **Abstract**

In order to simulate the computer game named Counter Strike - Global Offensive using Object – Oriented – Methodology ( O.O.M. ), to model the players, their strategies as JAVA classes, encapsulating features and actions of players as member attributes and member functions of JAVA class respectively.

# **DECLARATION**

We hereby declare that the work presented in this project report entitled “***Counter Strike – AutoPlay Simulator***”, submitted as mid-semester report of B.Tech. (IT) at Indian Institute of Information Technology, Lucknow, is an authenticated record of our original work being carried out from August 2019 to November 2019 under the guidance of **Dr. Vishal Krishna Singh**. Due acknowledgements has been made in the text to all other material used. The project was done in full compliance with the requirements and constraints of the prescribed curriculum.

Place: Allahabad

Date: 21 September 2019

Utkarsh  
Gupta

(LIT2016009)

# **CERTIFICATE**

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date: 21 September 2019

Dr. Vishal Krishna Singh

Place: Allahabad

IIIT-Lucknow

# **ACKNOWLEDGEMENT**

This satisfaction that accompanies the successful completion of any task would be incomplete without the mention of few people whose ceaseless cooperation made it possible; whose constant guidance ,inspiration and constructive suggestions that were helpful to me and my group in the preparation of this project.

A very special thanks to **Dr. Vishal Krishna Singh**, our project supervisor, for motivating and inspiring all of us. We are grateful to his for the strong support, guidance, inspiration and constructive suggestions that helped us a lot in the preparation of this project.

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# **PROBLEM DEFINITION**

Computer game named Counter Strike – Global Offensive is a extremely time taking and long game as per talking about it's computational intensiveness. And it's tedious to predict or compute it's outcome as no mathematical model can be developed.

# **OBJECTIVE**

To develop a simulator of the computer game named Counter Strike - Global Offensive using Object – Oriented – Methodology ( O.O.M. ), to model the players, their strategies as JAVA classes, encapsulating features and actions of players as member attributes and member functions of JAVA class respectively.



# PROPOSED APPROACH

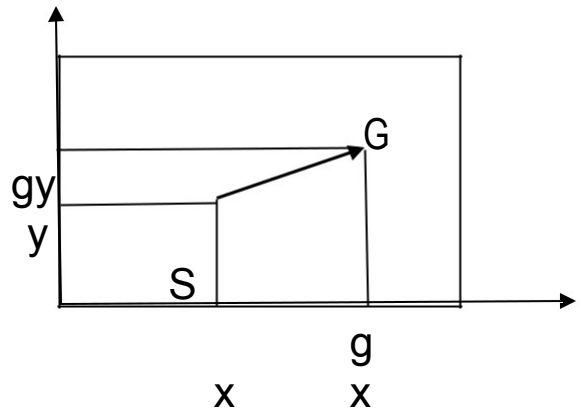
Use Object – Oriented – Methodology ( O.O.M. ), to model the players, their strategies as JAVA classes, encapsulating features and actions of players as member attributes and member functions of JAVA class respectively.

## **AIMove**

Every player has a position in X axis, a position in Y axis and an orientation. The orientation is an angle state governs where the person is looking at ( $\theta$ ).

Suppose the current position is  $S(x,y)$ . The player is moving at a speed  $s$  towards a goal at  $G(gx,gy)$ . The position at the next time step is given by:

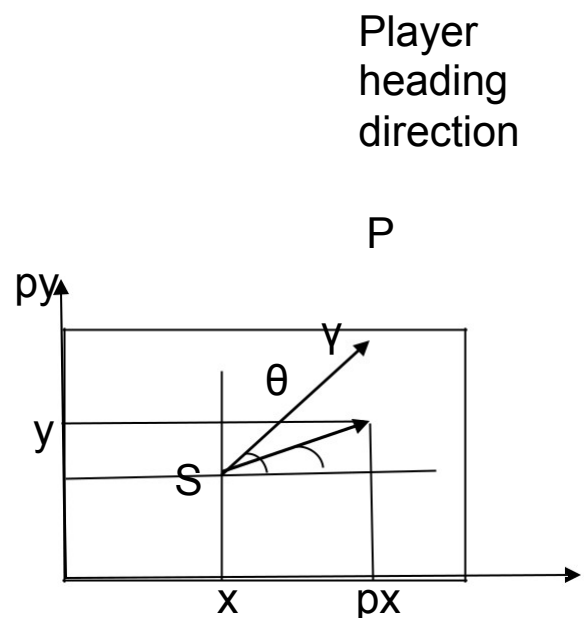
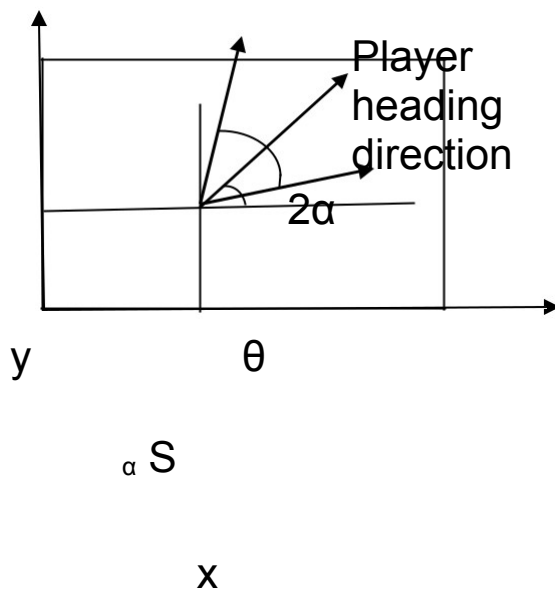
$$(x',y')=(x,y)+s(gx-x,gy-y)/\sqrt{(gx-x)^2+(gy-y)^2}$$



The proof is simple. Consider the vector  $G-S$ , that is  $(gx-x,gy-y)$ . A unit vector in the same direction is  $(gx-x,gy-y)/\sqrt{(gx-x)^2+(gy-y)^2}$ , while a vector at a distance of  $s$  from  $S$  is given by the formula.

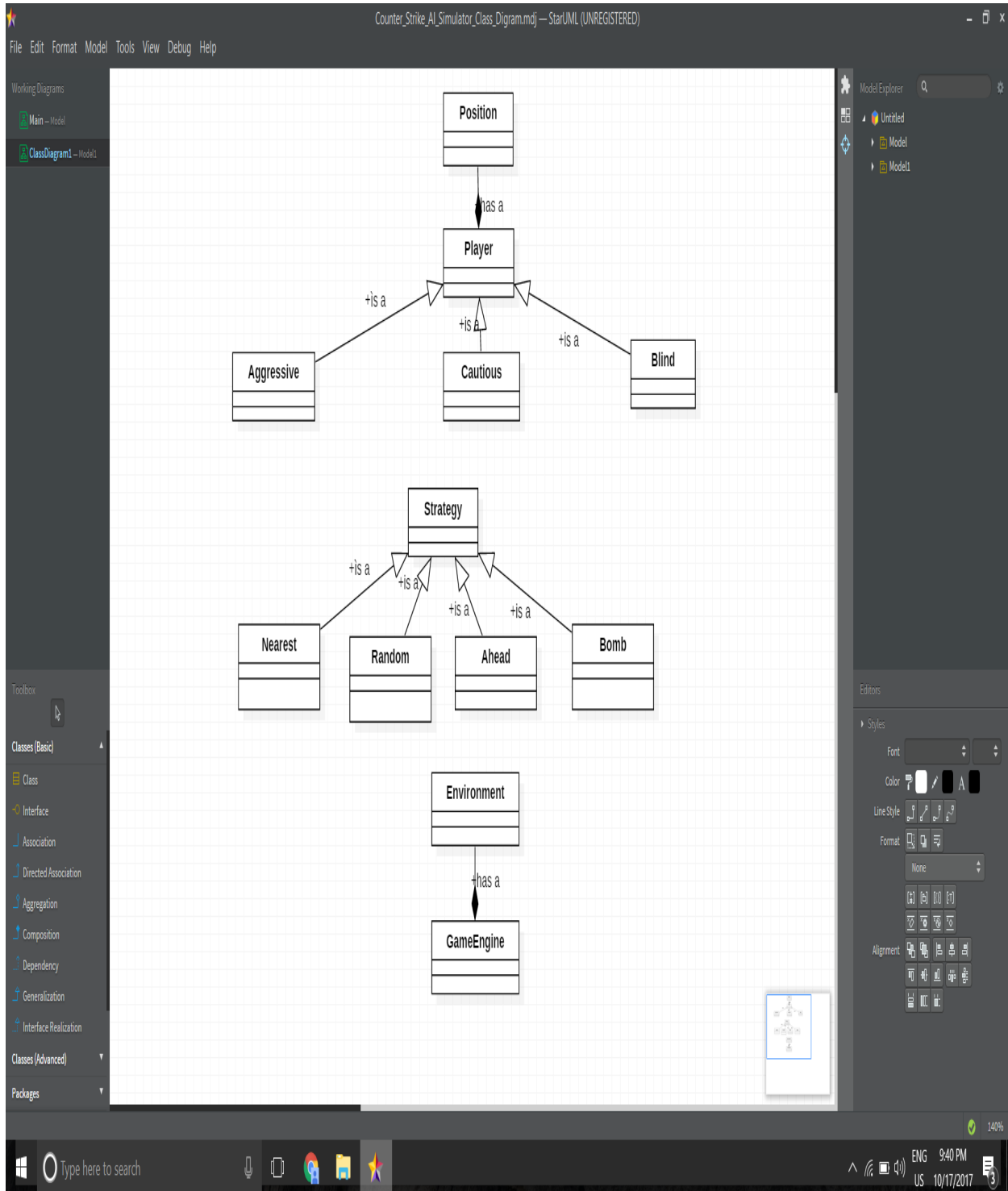
## site()

The function checks if two players are in line of sight to each other. Assume each player can see  $\alpha$  radians around the current orientation ( $\theta$ ). The person is facing at an angle of  $\theta$ , while can look around the angle of  $\pm \alpha$  from the current orientation. The angle  $\alpha$  is different for different players. The angular range of view of the person is hence in the range  $\theta - \alpha$  to  $\theta + \alpha$ .



The angle subtended by a new person at  $(px, py)$  is  $\gamma = \text{atan2}(py - y, px - x)$ . The person is in line of sight if  $\theta - \alpha < \gamma < \theta + \alpha$ . However since angles have a circular property the inequality cannot be directly used. The angle between the heading direction and line SP is given by  $\theta - \gamma$ . Hence for angular coverage,  $\cos(\theta - \gamma) > \cos(\alpha)$ .

The 'ahead' is simply taking  $\alpha = 60$  degrees



# **SOFTWARE REQUIREMENT**

## **Programming Tools:**

Object Oriented Methodology  
Netbeans  
Star UML

## **Programming Language:**

JAVA

## **SUGGESTIONS OF BOARD MEMBERS**



