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Survey Paper on Artificial Intelligence in Gaming

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ABSTRACT: The proposed will be a computer game version of a popular game Mario. Instead of having a single player like in Mario our system has 2 players. where both the players are controlled by user therefore making it a two - player game. This adds more functionality and more diversity to a game. The game use artificial intelligence to create enemies and helps to make the game more challenging. The end goal of the game is that both the players need to complete the level together.

KEYWORDS: Energy efficient algorithm; Manets; total transmission energy; maximum number of hops; network lifetime

I. INTRODUCTION

Use Unity 3D engine to create a 2D 2 player game each player has finite amount of life. Main goal of the game is to reach from one starting point to the end point while maintaining their lives, so both have to reach the end point. Artificial Intelligence is used to create enemies which take the life of the player. The player has the ability to shoot the enemy or avoid them. There are different kind of enemies that are introduced to make the game hard and interesting. Each player has their own ways of completing the task. Artificial Intelligence tracks every movements of the players and acts accordingly. Enemies are based on Artificial Intelligence. so it very difficult to complete the task. There are some tricky paths which the players has to identify and play accordingly.

II. LITERATURE SURVEY

.In [1] This paper is regarding the game of 2 player which can be played with the patrolling bots. Having understood the basic idea of the project which tells about basic idea and background for the proposed system. Different methods and principles have been studied to implement an 2d 2player game. By Raluca D. Gaina (2016), a system providing 2D game was implemented is to directly test against each other in more complex and dynamic environment, where there is an extra uncertainty in a game, consisting of the behaviour of the other player. In [2] authors have introduced the matrices for the single jump actions in which it includes the matrices to validate the framework. In [3] authors have defined about the game playing system in which one can play the game without the human involvement. It was the



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overview of the technical and logistics issue and define the long-range goals of artificial intelligence. In[4] authors main objective was to set range of problems that occur during the learning and planning the algorithms. So, it defines the multiple agents like learning agent, with visible observations. It defines the game dynamics and how the game should work for the specified algorithm. In [5] authors have defined how the artificial intelligence in gaming has inflicted many programmers to create game for puzzle solving and increase the core competition in the market and how to keep the tract of the difficulty of the game and complexity with some basic agents.

III. PROPOSED ALGORITHM

A. Design Considerations:

- Starting position of the player and enemies
- Considered all possible paths at beginning
- Level design based on the level player wants to play.
- Advance movements of the enemy.
- Properties of the player like: - speed, jump height etc.

B. Description of the Proposed Algorithm:

In this proposed system we will bring two players concept, in this the player will detect the enemy and will try to destroy him, if the player1 gets destroyed then player2 have to complete the game. The AI enemy will have its own algorithm to find the players and to destroy them by learning their movements. If both the players get destroyed then the game will end. The proposed algorithm is consisting of two main steps.

Step 1: Player Movement:

The Player Movement consist of a specific direction at a time in which it can move up, down, forward or backwards depending on the key the user presses. Each key is specified to a specific movement depending on the user. The movements involved are following the basic rules of physics.

Force is in newton ($1 \text{ N} = 1 \text{ kg} \cdot \text{m}/\text{s}^2$), mass in kg, acceleration in m/s^2

force = mass x acceleration

The mass is specified in the rigidBody, you add the force and the system calculates the acceleration:

acceleration = force / mass

the strength of the force you're adding is the magnitude of the vector to be precise, and the vector also supplies the direction.)

where k is constant and n is path loss factor which is generally between (2-4) [8].



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Step 2: Enemy Movement:

The Enemy Movement consists of A* Algorithm. The enemy movements are dependent on the movement of the player that how the player moves and the enemy calculates the best path towards the player and make the play more interest and difficult. The enemy uses the A* algorithm to find the best path towards the player and reads the movement of the player and calculates the best path to the player as on collision it destroys the player.

$$f(n) = g(n) + h(n);$$

IV. PSEUDO CODE

```
Step 1: function reconstruct_path (cameFrom, current)
    total_path: = {current}
    while current in cameFrom.Keys:
        current: = cameFrom[current]

    total_path.append(current)

    return total_path
Step 2: function A_Star(start, goal)
    closedSet: = {}
    openSet: = {start}
Step 3: cameFrom: = an empty map

Step 4: gScore: = map with default value of Infinity.
Step 5: gScore[start]: = 0.

Step 6: fScore := map with default value of Infinity.
Step 7: fScore[start]: = heuristic_cost_estimate (start, goal).
Step 8: while openSet is not empty

    current: = the node in openSet having the lowest fScore []
    value if current = goal

    return reconstruct_path (cameFrom, current)
Step 9: openSet.Remove(current)
    closedSet.Add(current)
Step 10: for each neighbor of current
    if neighbor in closedSet

        continue
Step 11: tentative_gScore := gScore[current] + dist_between (current, neighbor)
Step 12: if neighbor not in openSet
    openSet.Add(neighbor)
    else if tentative_gScore >= gScore[neighbor]

        continue
Step 13: cameFrom[neighbor]: = current
    gScore[neighbor]: = tentative_gScore
    fScore[neighbor]: = gScore[neighbor] + heuristic_cost_estimate(neighbor, goal)
Step 14: End
```



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V. CONCLUSION AND FUTURE WORK

In the proposed system, we will use the concept in which we will improve the movement strategies and make the AI enemy more advanced and less predictable than the traditional system. The future work of the

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