

Smart Rocket System

1. Introduction

To train the agents to reach the goal within the search sample space, an algorithm can be developed. The algorithm's task is to identify the goal within the given sample space and find the most optimal solution for all the agents involved in the search process. By providing the algorithm with the sample space, it can analyze and evaluate different paths and strategies to guide the agents towards the goal. The objective is to optimize the agents' search efforts and enhance their ability to achieve the desired outcome.

2. Algorithm

The algorithm here we have used is Genetic Algorithm. The Methodology is given here following:

3. Methodology

These following methodologies are used:

- Selection
- Cross-over
- Mutation

3.1. Selection

The first step of the algorithm is to select individuals to be copied into the next generation. There are multiple selection techniques that can be used here. Choosing the fittest individuals from the previous generation or choosing the more fit individual is more likely but not certain. Different approaches can be taken to determine if the individual is likely to be selected for the next generation.

3.2. Cross-over

Once the individual has been selected the next step is to produce offspring's. This step can also be done using multiple different techniques. The children will take half of the chromosomes from each parent. Sometimes only Child 1 or child 2 created, but oftentimes both are created. There is also a possibility that the parents are directly copied to the new generation.

3.3. Mutation

Now there is a new population full of individuals. To ensure that the individuals are not the same, a small chance of mutation is allowed. All the individuals are processed, and if selected for mutation, they are changed by a small amount. The possibility of mutation occurring is about 1% to 2%.

4. Working

A goal or target is established for the agents to reach. The initial number of agents is determined, and an initial force is applied to each agent in a random direction. The agents move by rotating around their own axis with angular velocity. A genetic algorithm is then employed to identify the most suitable agent that is closest to the goal. The algorithm optimizes the selected agent's value and creates copies. Once again, the agents are subjected to force, and they move towards the goal with improved performance. This iterative process continues, ultimately leading to a greater number of agents successfully reaching the goal.

5. Visualization

By this Visualization we can understand easily the better performance of the Agents by Genetic Algo.

