Genetic Algorithm : Solving obstacle related course

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January 12, 2020

1 Problem Faced

Wanted to solve the dinosaur game of Google Chrome.
1.It is very cumbersome to press space bar multiple times
2.Gets boring to play the game

2 Proposed Solution

Using genetic algorithm to solve this problem.

3 Genetic Algorithm

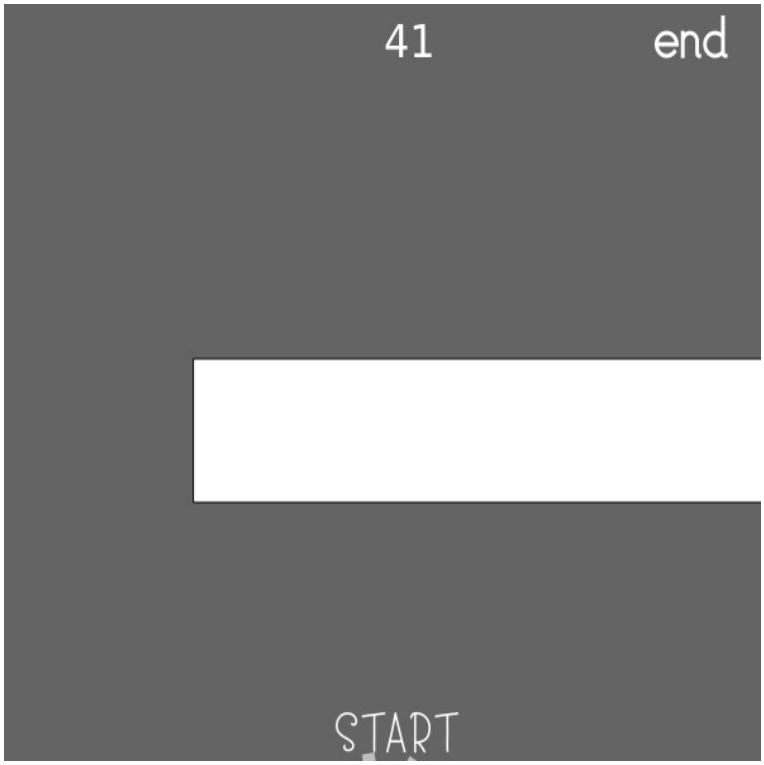
A genetic algorithm is a search algorithm that is inspired by Charles Darwin's theory of natural evolution. This algorithm reflects the process of natural selection where the fittest individuals are selected for reproduction in order to produce offspring of the next generation.

Five phases are considered in a genetic algorithm.
1 . Initial population
2 . Fitness function
3 . Selection
4 . Crossover
5 . Mutation

4 Problem solved

To go around a obstacle.where obstacle position is not know for the object and even the end position is not know

To find certain set of direction to reach from start to end



5 Initial Population

The process begins with a set of individuals which is called a Population. Each individual is a solution to the problem you want to solve.

In this problem random set of direction

6 Fitness Function

The fitness function determines how fit an individual is (the ability of an individual to compete with other individuals). It gives a fitness score to each individual. The probability that an individual will be selected for reproduction is based on its fitness score.

In this problem fitness score depends on :

1 . The distance from the END point
2 . If it has collided with obstacle
3 . The time it was alive

7 Selection

The idea of selection phase is to select the fittest individuals and let them pass their genes to the next generation.

Here genes is the set of direction

8 Crossover

For each pair of parents to be mated, a crossover point is chosen at random from within the genes.
Offspring are created by exchanging the genes of parents among themselves until the crossover point is reached.

9 Mutation

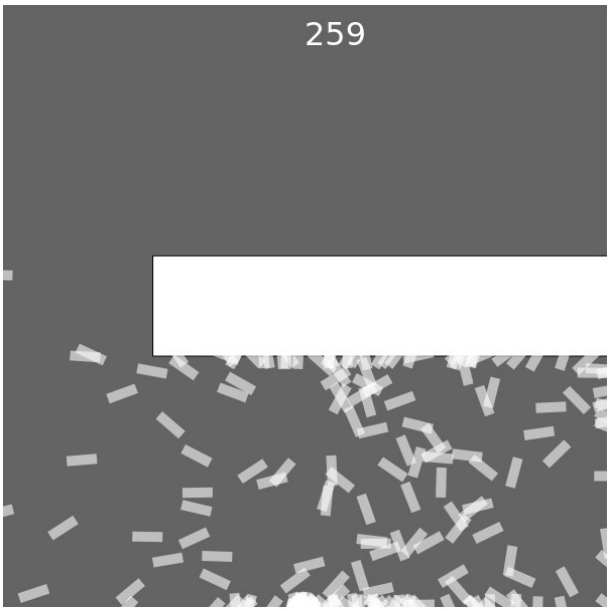
Some of their genes can be subjected to a mutation with a low random probability

In this example some random direction is added to their gene at 1percent chance

10 Working

At the start it performs very badly as it moves randomly

After sometime



Final

11 Tech used

Used p5js is a javascript library similar to canvas.js

12 References

https://www.geeksforgeeks.org/genetic-algorithms/