Final Project Proposal

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1 Introduction

Our project proposal revolves around the idea of using genetic algorithms to find a way to optimally play the popular game "Flappy Bird". In May of 2013, Flappy Bird was released and instantly became a hit. The game consists of a bird that is flying through a series of pipes until it either hits the pipes, the ground, or the sky. Through this project, we are going to find a way to code a agent that will be able to effectively navigate the game's obstacles.

2 Background

Genetic Algorithms are based on the idea of swapping genes in strands of DNA to similuate the process of natural selection. The idea of genetic algorithms stems from the work of Charles Darwin and his ideas of evolution and natural selection. Computer scientists took these ideas and used them in the field of AI. [1] Inside a genetic algorithm, there are two main ways to modify a strand of DNA. The first is through the process of mutations. In mutations, this means that some of the values in the string will be randomly changed. The second way to change the string of DNA is through the process of crossover. In crossover, 2 strands of DNA will be swapped with each other. Both of these methods will help provide genetic diversity and give the agent a change to be effective in the game.

3 Details

3.1 Problem Description

This would be a interesting project to work on as it would be a fun way to beat a game that was a large part of society at one point. The problem that we will be tackling is finding a way to keep the bird alive for an extended period of time without hitting an obstacles. Additionally, this app was known for being difficult to get a high score on, so it would be an engaging task to create an algorithm that can score well.

3.2 Approach

In order to solve this problem, we will be using a genetic algorithm. There will be a few things that we will need to take into consideration when building this algorithm. The most important one is to make sure that the agent will be positioned to be in the middle of the to pipes when it goes between them. This means that the agent will need to either tap if it is too low or not tap if it is too high. Additionally, we need to sure that the agent doesn't hit the ground or the sky.

3.3 Software

The software that we will be using for this project includes a open-source repository taht already has a working Flappy-Bird game. This repository build the game in python using the pygame library. For coding a genetic algorithm, we will also be using python.

4 Peliminary Work

5 Evaluation

6 Time Frame

References

[1] Burak Kanber Lee Jacobson. 2015. *Genetic Algorithms in Java Basics* (1st. ed.). New York, NY: Apress, New York, NY.