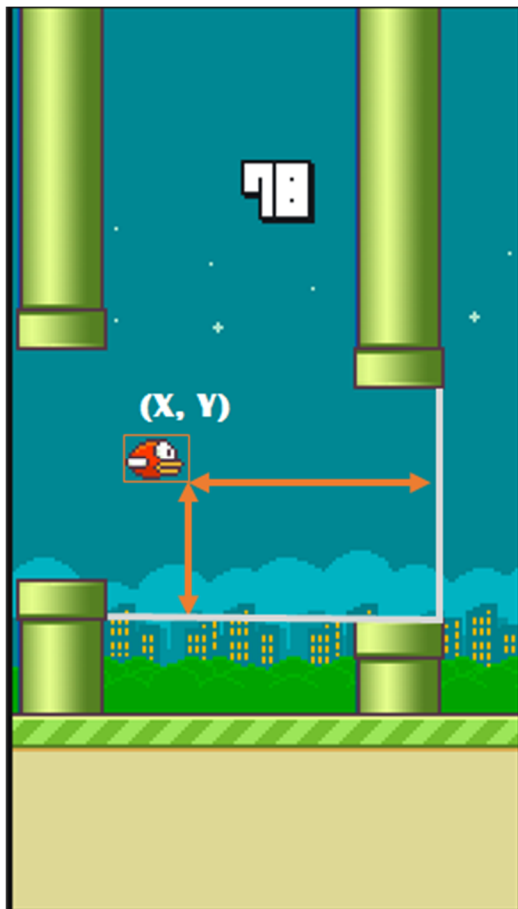


Flappy Bird : Learning to Fly

Overview

Flappy Bird lives in an environment where it has to fly from one end to another. But it is not as simple as it sounds because there are obstacles which it needs to overcome. Obstacles are in the form of randomly occurring set of pipes which allow a small gap to pass through. So the objective of this project is to design an AI which will help Flappy Bird to cross the path without hitting the pipes or crashing into the ground.

Screenshot



91.543 Artificial Intelligence

Concepts Demonstrated

The AI concepts that we are using are:

"Markov Decision Processes (MDPs) - A framework to model our optimization algorithm

"Q - Learning - It assigns a utility to each action at a stage and thus finds an optimal policy to succeed by doing the preferred action.

Innovation

Our project is a demonstration of learning AI by following a model free approach. It has applications in areas which require emulation of human like learning behavior by learning through mistakes.

Technology Used Block Diagram

Evaluation of Results

The main goals in this game were to move forward without being hit by the pipes and live as long as possible. The game had only two actions primarily - Jump and Not Jump. So after a sequence of training episodes Flappy Bird designs a policy through which it computes the next action to be taken and obtain as much rewards as possible.

Additional Remarks

We had to make an early to call whether we need to design the GUI. But since there were time constraints, we rather chose to clone a version of Flappy Bird implemented in Python. Because of the game's dynamics and the physics involved in it, the accuracy may vary by a very small value in some games.