

- **Theme (AI as ...):**

AI as Playtester

- **Overview (Purpose of the project. What it does):**

In this project, we created an AI for the game, Flappy Bird. The core gameplay of the game is about avoiding procedurally appearing obstacles with a limited movement of the bird. The AI recognizes the game and manages to avoid obstacles. However, it does that in a too systematic of a way. In order to achieve a human like behavior from the AI, we made some changes in its algorithm. We lower its awareness from the game level to function similar to human vision. It can only see what is on the screen at any given moment. We also, altered its behaviors to act “safer” and prefers to stay at the middle of the screen if possible.

The ultimate goal is to use this AI to help the designer creating a more balanced levels, particularly in games that requires frequent iteration on same level. In this game example, the AI can help designer to tweak variables such as: the speed of the bird, the bird size, the bird velocity, the strength of its bouncing, the vertical and horizontal gap between pipes, etc. These are all variables that we’ve used in our game state to guide the AI through the obstacles in level. The same information can be used to polish the level.

- **Novelty:**

Almost all of the AIs currently used in video games act too machine like to be considered a substitute for a human player. AIs are either designed as a prop in a videogame or at times designed to outsmart human players. However, the AI that we set to develop is supposed to be indistinguishable from a human player instead of being superior or inferior to one. Also, the goal of such an AI is to assist the designers themselves instead of having any interaction with the player.

- **Value:**

Due to the nature of game development process, the procedure of creating a game is an iterative process. A game from start to finish requires multiple revisions using the information from players. However, in real world, there are problems with that approach: there aren't always as enough playtesters available; the feedbacks provided by players are not always accurate; and finally, the skill levels of players varies and it is also hard to measure. By creating an artificial tester that can behave similar to a human player, we have the option of playtesting the game over and over again. By generating heat maps, finish times and other statistics, designers can find the flaws in the game and the level and tweak it to their likings.

- **Technology (core tech, algorithm):**

The project was supposed to be in Unity environment using C# language and MCTS. However, due to complications of accessing built in Unity functions and having control over the game state, we ended of using the stripped down version of the game, with focus on movement and object avoidance. So, the final version of the game is using a modified version of Flappy Bird in python and MCTS.