Minor Project
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AI Learns To Play Flappy Bird With NEAT Algorithm

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OVERVIEW

NEAT is an algorithm that evolves neural networks to play Flappy Bird by adjusting connections and structure over generations, gradually improving performance.

Future GOALS

1. Self-Driving Cars: NEAT Behind the Wheel
2. Robots That Learn: NEAT Powers Up Automation
3. Science Breakthroughs: NEAT Analyzes Big Data

References

AI Teaches Itself to play a game

Application of NEAT on playing a Game | by Sanjay.M | AIKISS | Medium

Improving the Performance of NEAT Related Algorithm via Complexity Reduction in Search Space | SpringerLink

[2112.03670] Hybrid Self-Attention NEAT: A novel evolutionary approach to improve the NEAT algorithm

NeuroEvolution of augmenting topologies for solving a two-stage hybrid flow shop scheduling problem: A comparison of different solution strategies - ScienceDirect

A NEAT Based Two Stage Neural Network Approach to Generate a Control Algorithm for a Pultrusion System

NEAT for large-scale reinforcement learning through evolutionary feature learning and policy gradient search

Real-Time Neuroevolution in the NERO Video Game

https://arxiv.org/pdf/2207.14140.pdf

https://ieeexplore.ieee.org/document/10193858

NEAT
NEAT

Xor-2
Overview of the basic XOR example (evolve-feedforward.py) — NEAT-Python 0.92 documentation

nn.Feed_Forward
https://neat-python.readthedocs.io/en/latest/_modules/nn/feed_forward.html

IJISRT22MAR617.pdf

Teaching AI to Play Games using Neuroevolution of Augmenting Topologies

NEAT DOC
Configuration file description — NEAT-Python 0.92 documentation

Neat-Python

Overview: module code — NEAT-Python 0.92 documentation

Flappy Bird Implementation using AI

https://www.semanticscholar.org/paper/FLAPPY-BIRD-IMPLEMENTATION-USING-AI-Singh-Tyagi/4a7e60b6147409724f90e5e24532ae4c00d2193d

MILESTONES

Base model

A basic Flappy Bird in Python uses Pygame to create a window where a bird sprite battles gravity. You control the bird (with spacebar) to fly through gaps between stationary or moving pipes. The game loop constantly updates the bird's position,

checks for collisions (with pipes or screen edges), and redraws the scene. It's a simple but challenging game built on core mechanics.

Neat Algo Model

Flappy Bird AI: Birds with tiny brains (neural networks) evolve through NEAT to become flying champions. They learn to dodge pipes based on game info (like bird position and pipe distance) and eventually master the game without programmed rules!