AI for Google Dino Game

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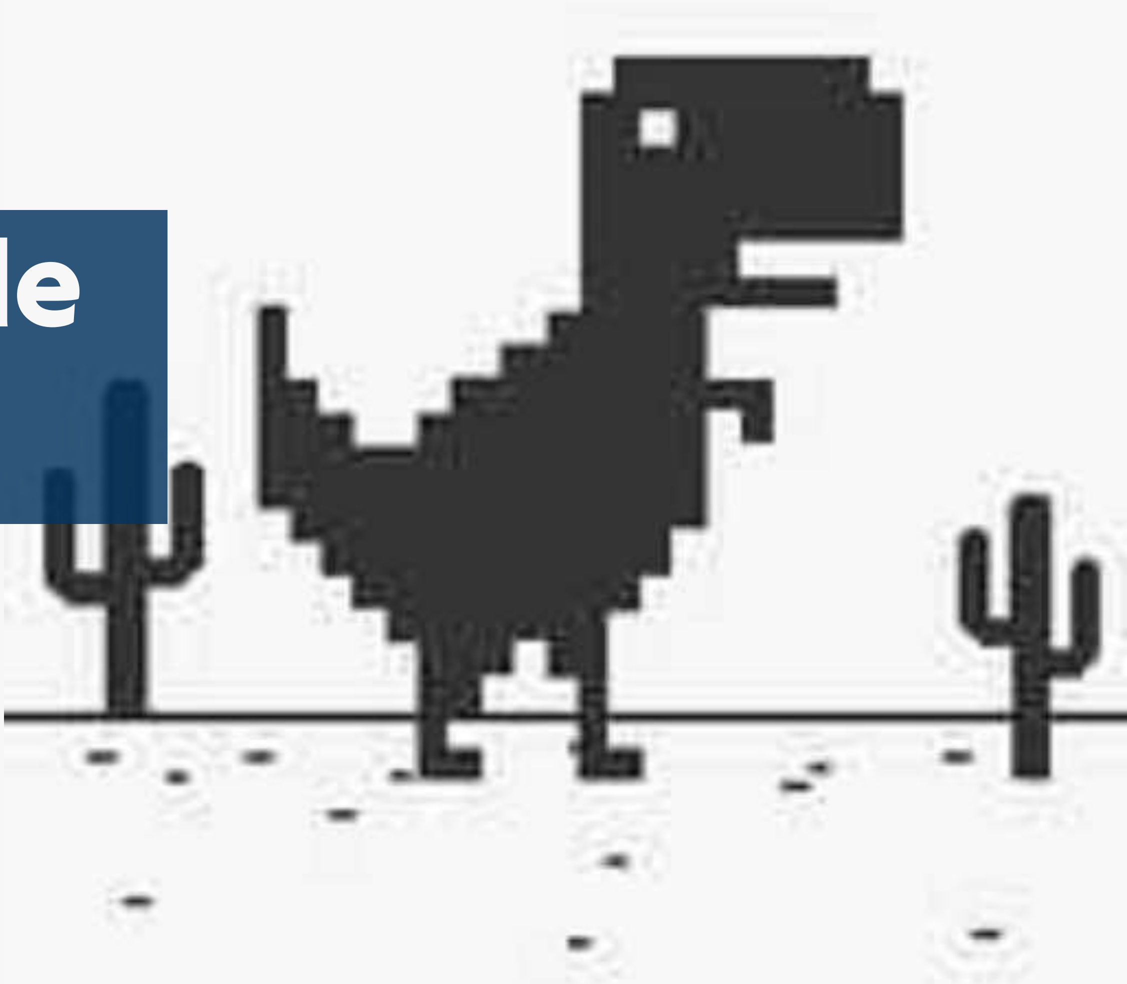
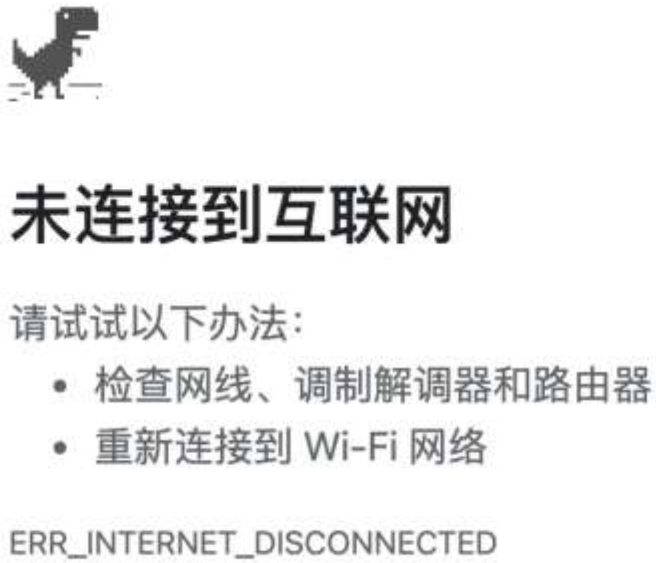




未连接到互联网

请试试以下办法：

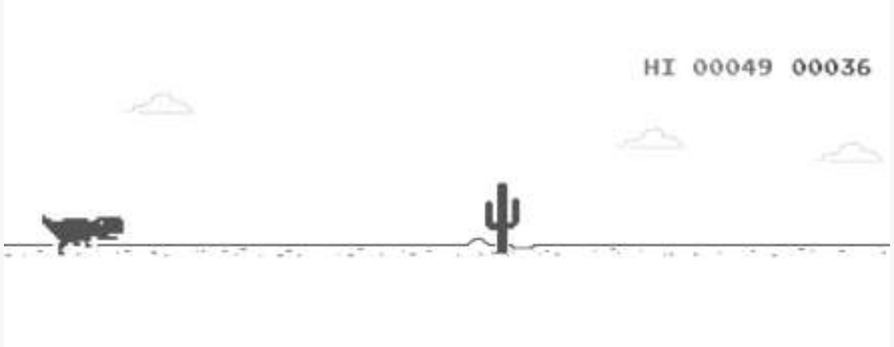
- 检查网线、调制解调器和路由器
- 重新连接到 Wi-Fi 网络

ERR_INTERNET_DISCONNECTED

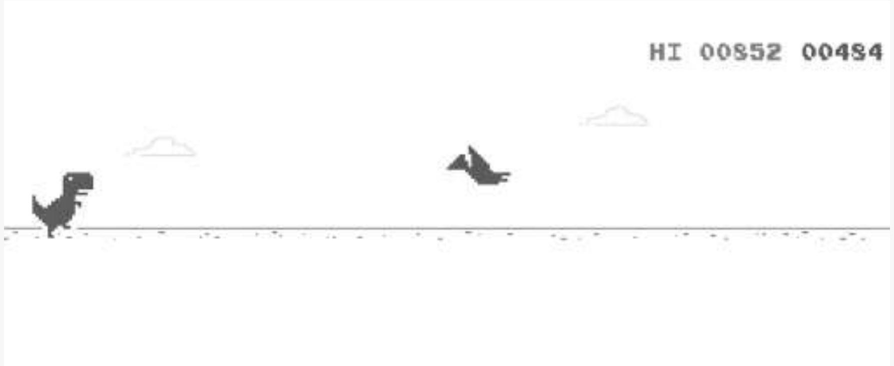
Intro to Chrome Dino Game

You can try it yourself by inputting chrome://dino or chrome://network-error/-106 into the Omnibox.

Game Rules

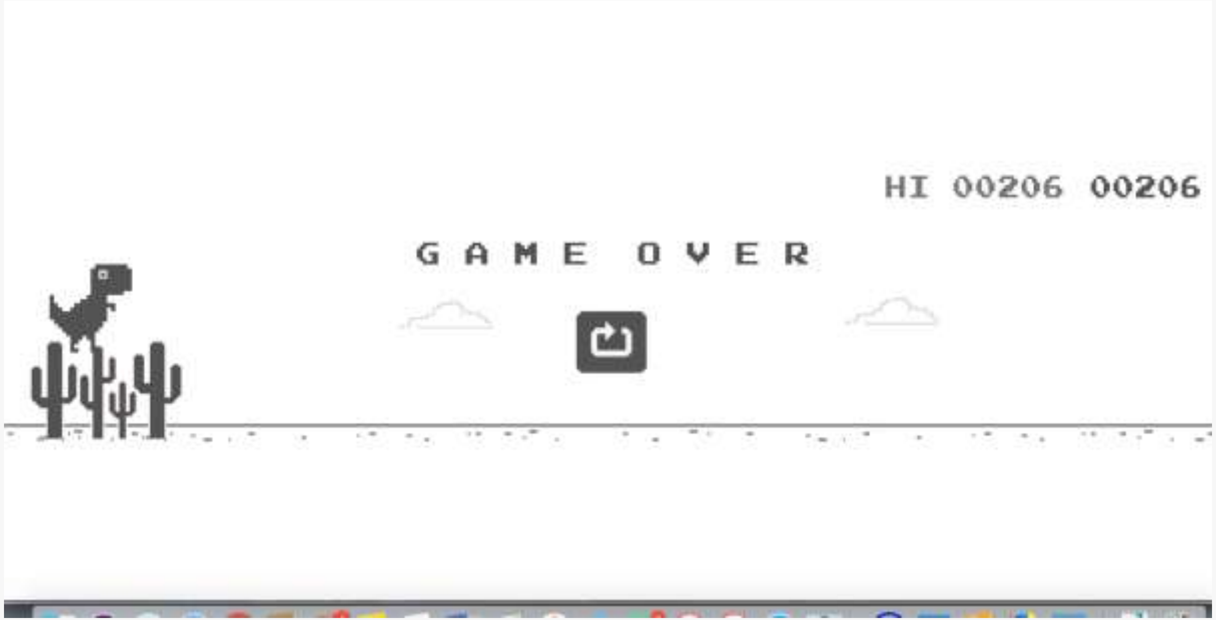


Press the “space” key to control the T-Rex to jump over the cacti.



Press the “down” key to control the T-Rex to dodge the birds.

Game Rules



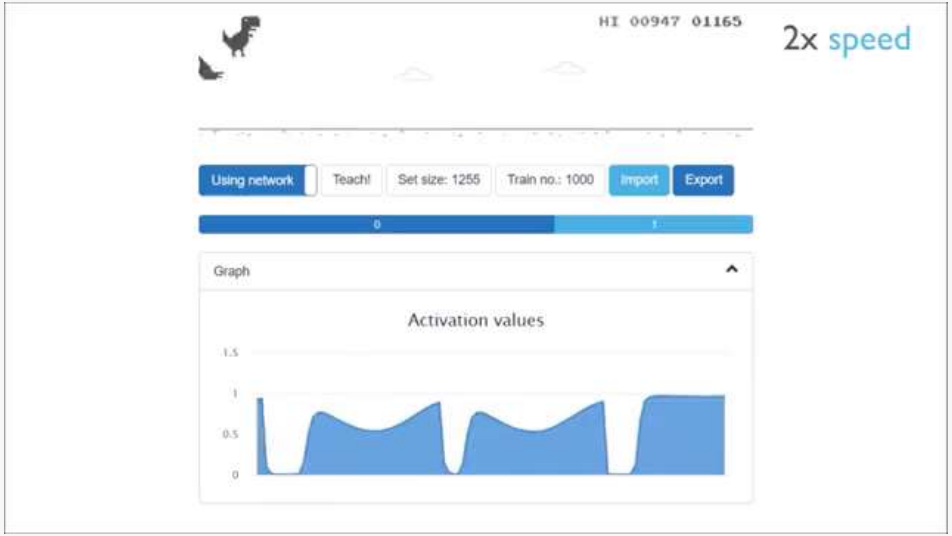
Player’s Final Goal:

To make this Lonely T-Rex run further.

Build the AI

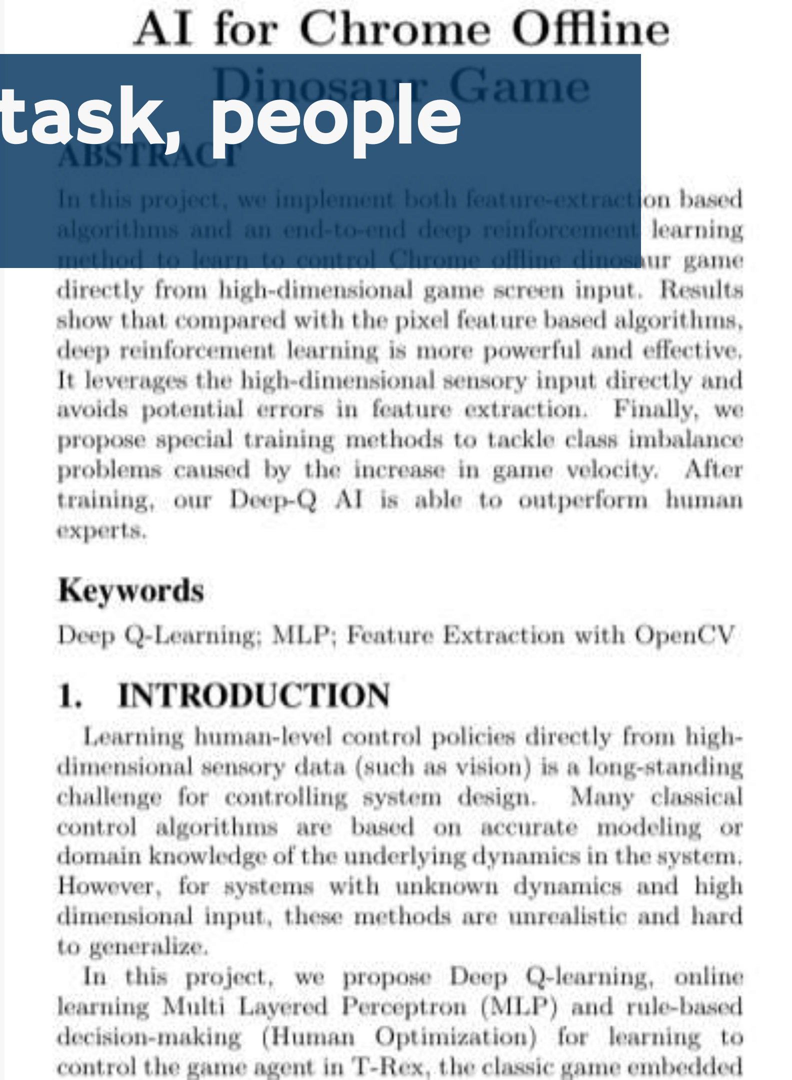
Reinforcement Learning: Deep Q-Network

In fact, this is not a new task, people have already done it



This is the demonstration video on YouTube.

There are even related papers or reports.



AI for Chrome Offline Dinosaur Game

ABSTRACT

In this project, we implement both feature-extraction based algorithms and an end-to-end deep reinforcement learning method to learn to control Chrome offline dinosaur game directly from high-dimensional game screen input. Results show that compared with the pixel feature based algorithms, deep reinforcement learning is more powerful and effective. It leverages the high-dimensional sensory input directly and avoids potential errors in feature extraction. Finally, we propose special training methods to tackle class imbalance problems caused by the increase in game velocity. After training, our Deep-Q AI is able to outperform human experts.

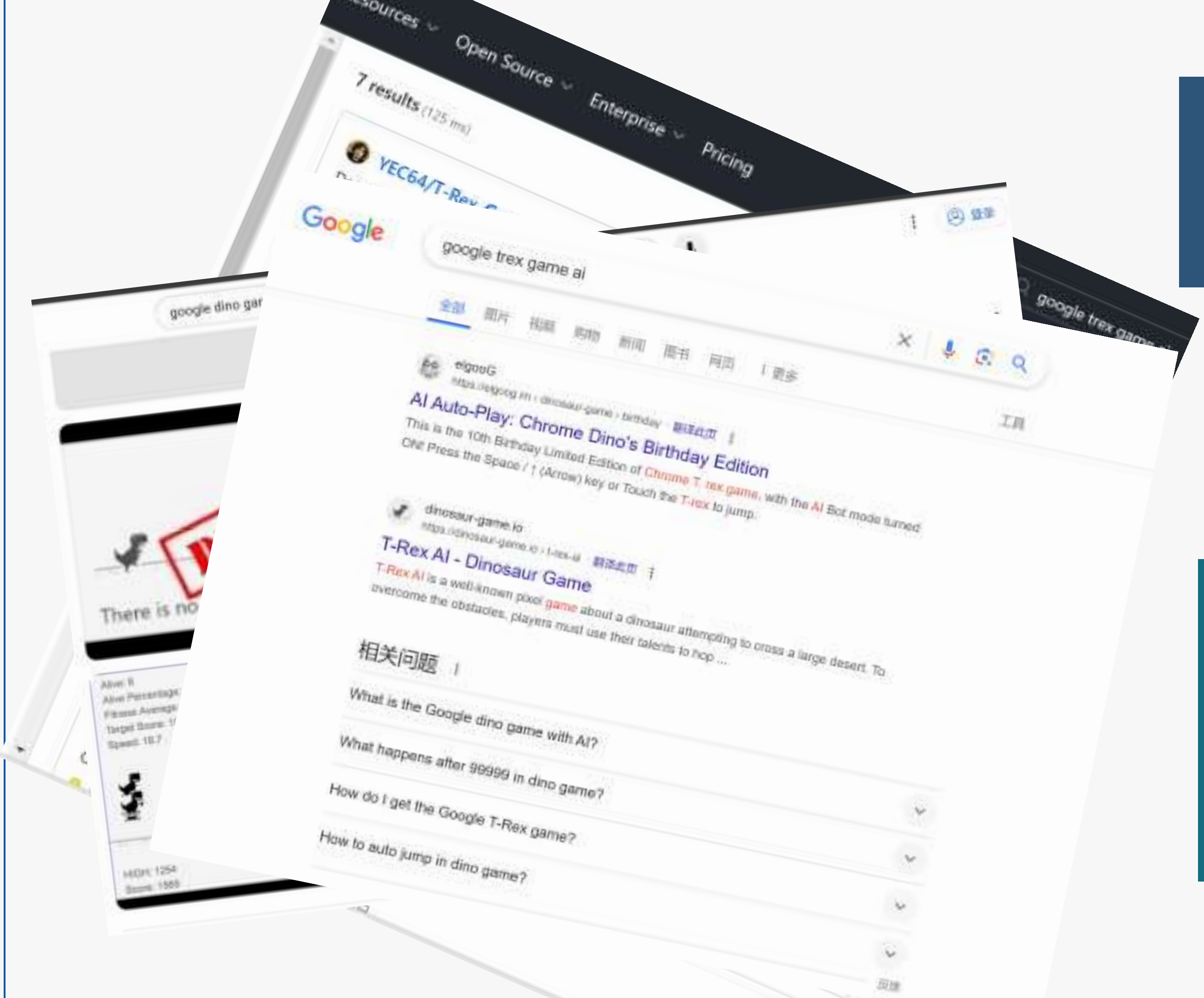
Keywords

Deep Q-Learning; MLP; Feature Extraction with OpenCV

1. INTRODUCTION

Learning human-level control policies directly from high-dimensional sensory data (such as vision) is a long-standing challenge for controlling system design. Many classical control algorithms are based on accurate modeling or domain knowledge of the underlying dynamics in the system. However, for systems with unknown dynamics and high dimensional input, these methods are unrealistic and hard to generalize.

In this project, we propose Deep Q-learning, online learning Multi Layered Perceptron (MLP) and rule-based decision-making (Human Optimization) for learning to control the game agent in T-Rex, the classic game embedded



google trex game ai

elgooG
https://elgoog.im › dinosaur-game › birthday 翻译此页

AI Auto-Play: Chrome Dino's Birthday Edition

This is the 10th Birthday Limited Edition of Chrome T-rex game, with the AI Bot mode turned ON! Press the Space / ↑ (Arrow) key or Touch the T-rex to jump.

dinosaur-game.io
https://dinosaur-game.io › t-rex-ai 翻译此页

T-Rex AI - Dinosaur Game

T-Rex AI is a well-known pixel game about a dinosaur attempting to cross a large desert. To overcome the obstacles, players must use their talents to hop ...

相关问题

What is the Google dino game with AI?

What happens after 99999 in dino game?

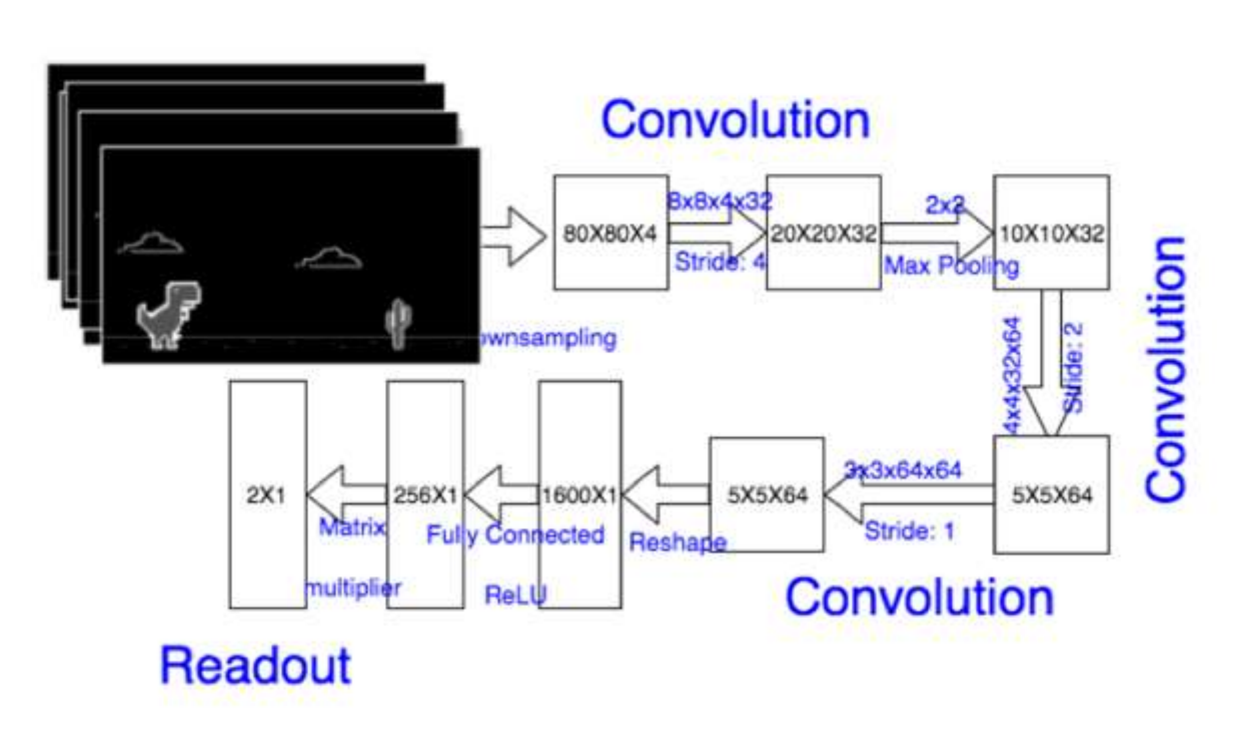
How do I get the Google T-Rex game?

How to auto jump in dino game?

Learn from others

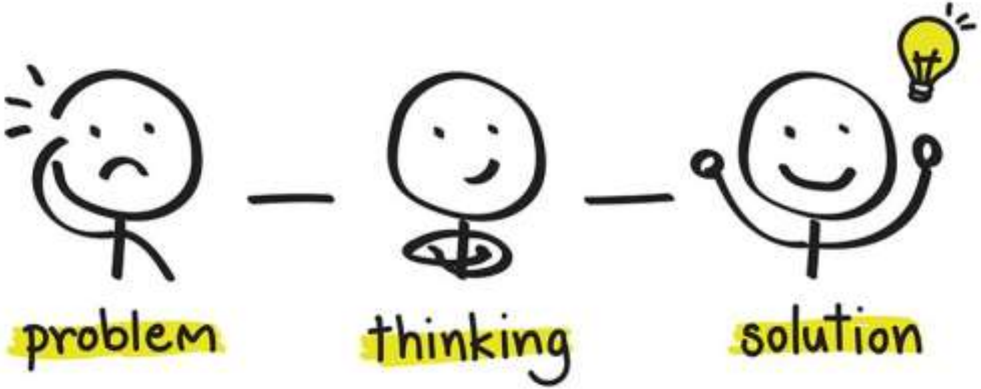
GitHub,
YouTube,
Google,
....

CNN Solution



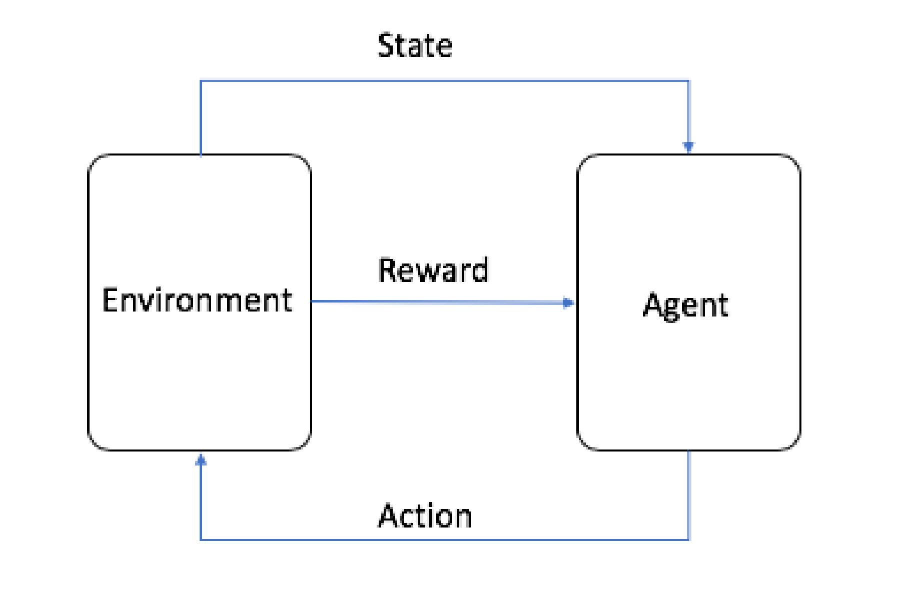
GitHub Link: https://github.com/g-arnav/DinoML

Is there a simpler way?



- I don’t know how to collect a large and useful dataset. Is there any machine learning method that is less dependent on the dataset?

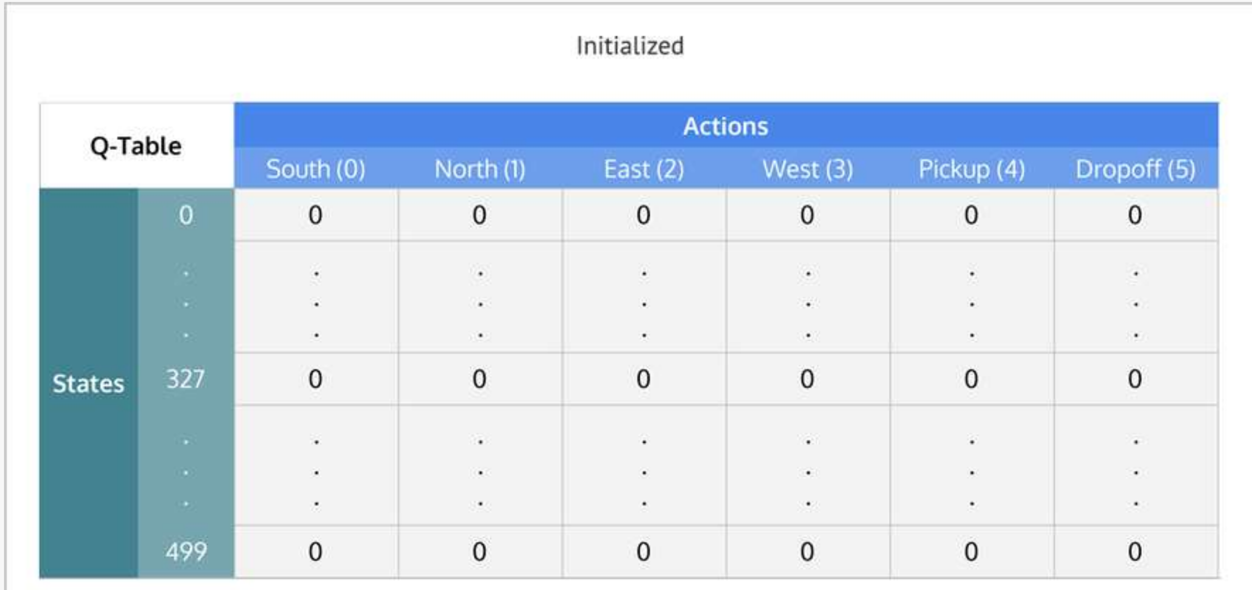
Reinforcement learning



Reinforcement learning is learning what to do—how to map situations to actions——so as to maximize a numerical reward signal.

---- Richard S. Sutton and Andrew G. Barto 《Reinforcement Learning: An Introduction II》

Q-learning



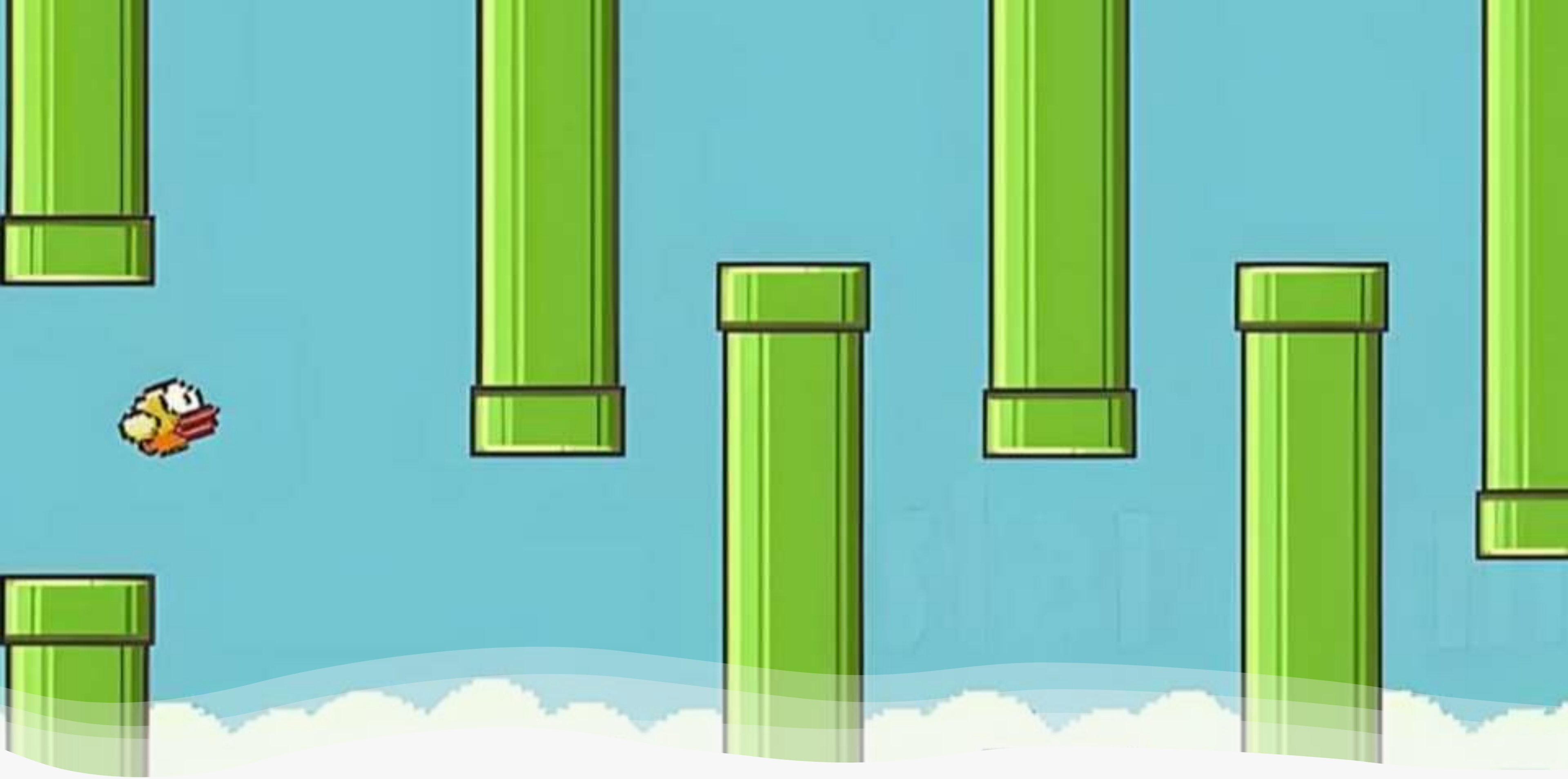
Initialized

Q-Table		Actions					
		South (0)	North (1)	East (2)	West (3)	Pickup (4)	Dropoff (5)
States	0	0	0	0	0	0	0
	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	327	0	0	0	0	0	0
	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	499	0	0	0	0	0	0

Q-Table Sample & Update Rules

from wiki

$$Q^{new}(S_t,A_t) \leftarrow (1-\underbrace{\alpha}_{\text{learning rate}})\cdot\underbrace{Q(S_t,A_t)}_{\text{current value}}+\underbrace{\alpha}_{\text{learning rate}}\cdot\underbrace{\bigg(\underbrace{R_{t+1}}_{\text{reward}}+\underbrace{\gamma}_{\text{discount factor}}\cdot\underbrace{\max_a Q(S_{t+1},a)}_{\text{estimate of optimal future value}}\bigg)}_{\text{new value (temporal difference target)}}$$

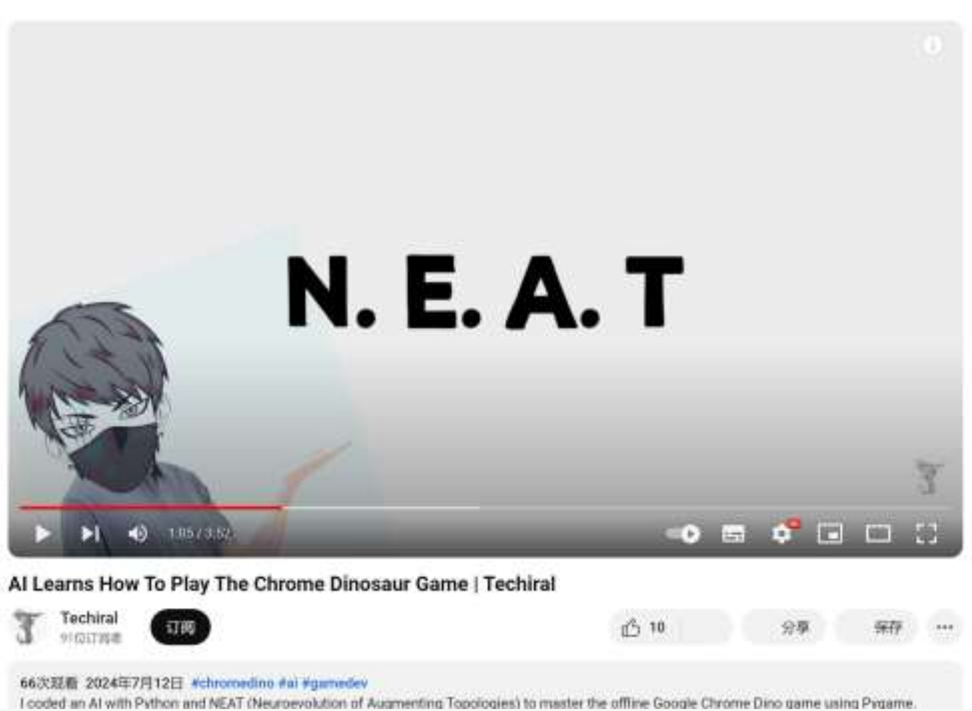


Flappy Bird Game

Other interesting implementation

NEAT Algorithm

NeuroEvolution of Augmenting Topologies



AI Learns How To Play The Chrome Dinosaur Game | Techiral

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66次观看 2024年7月12日 #chromedino #ai #gamedev
I coded an AI with Python and NEAT (Neuroevolution of Augmenting Topologies) to master the offline Google Chrome Dino game using Pygame.

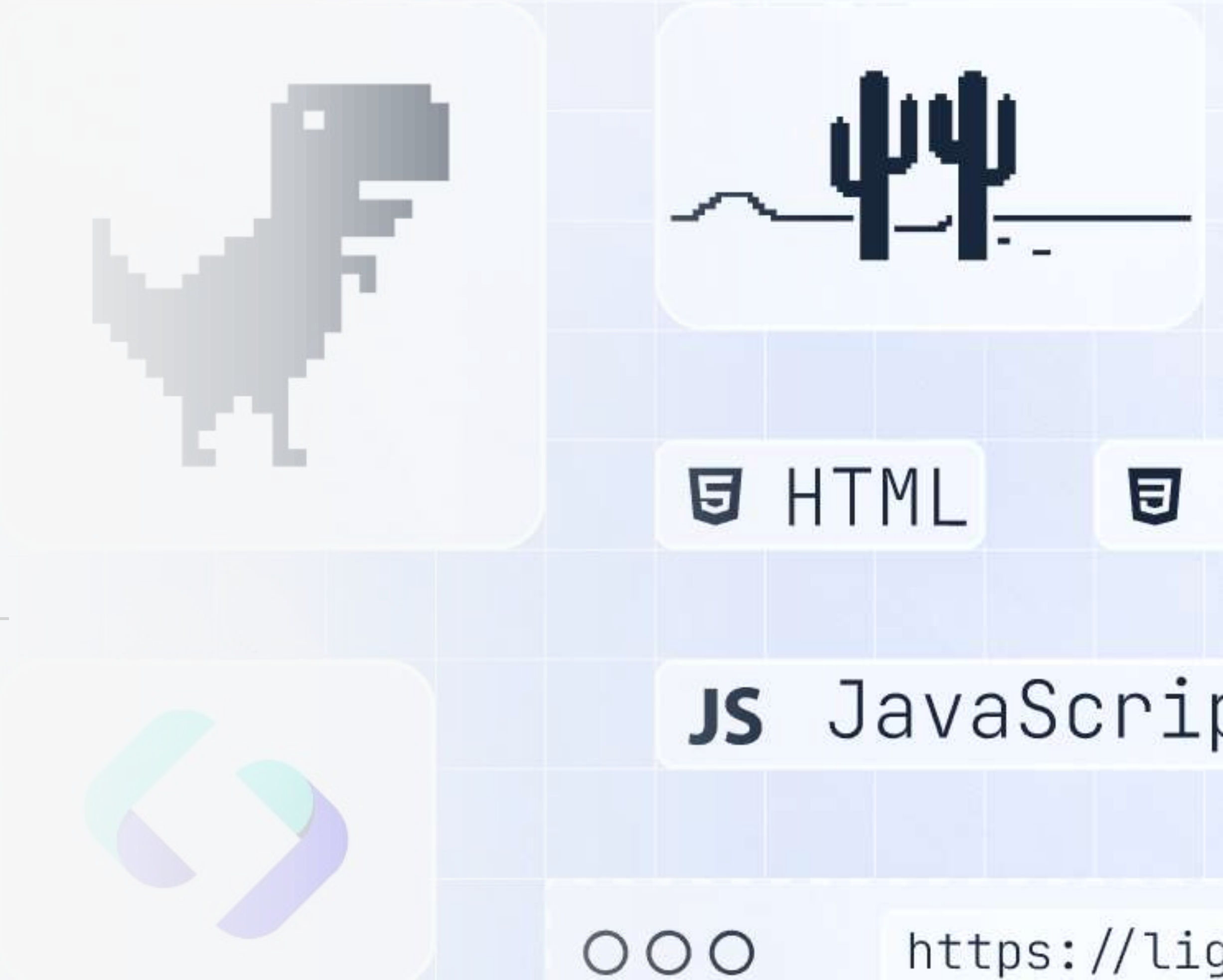
NeuroEvolution of Augmenting Topologies (NEAT) is a genetic algorithm (GA) for the generation of evolving artificial neural networks (a neuroevolution technique) . It alters both the weighting parameters and structures of networks, attempting to find a balance between the fitness of evolved solutions and their diversity. It is based on applying three key techniques: tracking genes with history markers to allow crossover among topologies, applying speciation (the evolution of species) to preserve innovations, and developing topologies incrementally from simple initial structures ("complexifying").

----wikipedia

GitHub Link: https://github.com/Techiral/Dino-AI-NEAT
YouTube Link: https://www.youtube.com/watch?v=aNjsatpVXqw

Thank You!

Q & A



Reference

Code Reference:

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https://github.com/nicknochnack/DinoAI
https://github.com/Anch9999/AiToDinoRun
https://github.com/RohitNagraj/DinoAI
https://github.com/ssusnic/Machine-Learning-Flappy-Bird
https://github.com/g-arnav/DinoML

Work Reference:

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https://www.youtube.com/watch?v=WMYG6IEgMfw