Invasion City – Rise of AI

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ABSTRACT

As students, we realize that just studying is not fun unless you associate a feeling or an emotion with it. It has also been proven by multiple scientists that once you associate information with specific emotion retention goes up by over 40%.
In order to make use of this information, we tried to create a project that helps you remember reinforcement learning in a way you never forget. Taking the help of a story we associate reinforcement learning with the emotions of freedom success happiness etc.
We believe that in this way we can help students retain better and understand the real meaning rather than just bookish knowledge.
Hence we decide to make a multifaceted game which is fun introducing users to the concepts of reinforcement learning and development of artificial Intelligence.
Our game has various features which make it unique .

1. Storyline – We have a interesting storyline depicted through a video which helps to gain the attention of the user.
2. Graph- Our game shows a graph which depicts the win ratio of AI creating a sense of winning and success in the heart of the user. At the same time understanding the essence of reinforcement learning.
3. Automate- If a person just wants to see the graph in order to understand the concept of reinforcement learning then he can also do so using our automate function.
4. Two Player- The game also allows you to play with your friends this fun game.

PROBLEM STATEMENT

We all know how difficult it is to understand the concepts without visualizing them. Therefore in order to explain the growth of AI with ease. We decided to make a game which will provide the required impetus to the students to get motivated and learn the fundamentals of AI.

Another objective of this project was to gather the attention of the students so that they reach the flow state of mind. Hence we decided to make a game which will fulfill all these aspects.

Our project Invasion city makes sure that we provide the students with a visualization for growth of AI as well as make it interesting for them in turn getting them into flow state. Our game gives immediate feedback. The graph gives you the feeling of the potential to succeed and its appealing GUI makes you engrossed in the process which are the things required to get into the flow state as stated by psychology writer Kendra Cherry.

The Development of AI to be depicted in a fun way is the main goal of the project. In the process understanding and realizing its importance and the vast impact it can have on the world.

MODULES AND METHODS

There are four modules in our project namely main, relearning, menu and engine.
The main module is the file which needs to be executed on order to run the game. It has all the main features like the graph, animating moves end game text, highlighting squares, draw pieces etc.

Menu is the file that contains all the instructions regarding
the menu. It contains the code for automation as well as Two playerfeature. Instructions, Credits, Settings, and the Background for the menuhave all been coded in this module

Relearning is the brain of the game ie the implementation of Artificial Intelligence. It decides which moves will be selected by the AI. It keeps an account of all the possible moves and takes intelligent moves based on a reward - punishment scheme in order for AI to eventually win.

It is the main engine of our game. It runs, decides the possible moves, allows & denies those moves according to the rules of the game. It further holds the responsibility of keeping the track of the game and movements as well as keeping a log of the data being generated.

RESULTS

We have created a game which is based on the development of AI. We have mainly used pygame as the building module. The game encompasses a storyline which instill the feelings of freedom, success and happiness.

The game analyzes the moves of the person and AI. It constantly learns as for every wrong move it is given a punishment . The concept of reinforcement learning has been used in order to decide the next move by the AI. All the possible moves are stored and based on the punishment scheme the moves are selected.

Our game has a story depicted through a video in order to make the game more appealing and entertaining. The user interface has also been designed to be minimalistic but at the same time complete and easy to use.

We have taken a approach where the machine based on the result evaluates whether it was a right move or a wrong move based on the evaluation when it is presented with the same kind of opportunity later it decides whether to go ahead with that move or try something different in order to win.

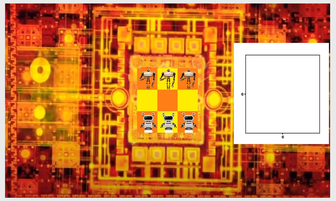


Figure 1. The user interface of our project .

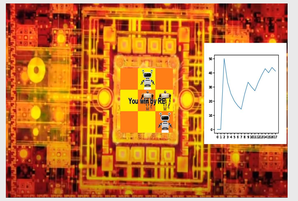
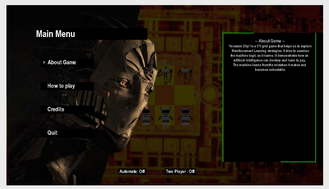
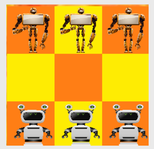


Figure 2. Graph showing reinforcement Learning



Menu.



Board.

FLOW OF THE PROJECT

1. In order to make the move the main file has to ask Relearning as to which are the steps it can take.
2. In order to achieve this the relearning file makes use of the engine file which gives the information regarding the rules and the player's position, recognize the moves etc.
3. Relearning used INVC Engine to determine whether on not a move is preferable for AI or not.
4. Now based on the decision made by the relearning file it will instruct the main file to execute. The main file makes use of image folder to establish the various icons in the GUI.
5. These icons and tools are required to make the game appealing and gain the focus of the user.
6. Whenever we use the esc key the main file makes use of menu to show the various options available. The main menu consists of About game how to play credits and an option to end the game.
7. One of the most interesting feature of our game is also seen in the menu which is the option to automate as well as play multiplayer. This is all possible due to the menu file.
8. The automate option automatically keeps on playing with the AI. This can be used to focus more on the graph which shows the effect of reinforcement learning and in two player. Two real people can play the game to make it more interesting

CONCLUSIONS

Our idea is unique and original. The game uses a different approach of marking down the wrong moves as opposed to general method of giving rewards for the positive result. It aims at improving the learning of the users by activating their interest in the field of AI.

At the end the game has been able to explain the development of AI in a fun manner.

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