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2 D Games AI Character by Genetic Algorithm

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Abstract

The challenge is about a individual technology for 2 Dimensional games. This could create enticing Artificial Intelligence character without the direct help of the professional software field person. This method makes use of genetic algorithm set of rules for creating Artificial Intelligence character. As the algorithms keeps on getting better with very generation so the fitness score or the path will be taken into account for the user. By the self getting fitter the human being will have the best opponent to play against it.

Keywords: *Genetic algorithm, artificial intelligence character, Tensor flow, python keras*

1. Introduction

In today's world, the gamming is not just to whiling the time away but nowadays its has become more competitive in nature. Many people in the entire world are taking gamming as their live hood and as profession.

Their many tournaments worldwide where player represent their country in respective games.

The demand and market of games are growing with a boom in the today markets so by seeing this the game also needs to improve. To improve the gamming we are using the genetic algorithm so that the user has better gaming experience. There are many games played online with the help of WAN and LAN server.

The continuous evolutions of the game will provide the gamer a better platform to learn the game and to play.

As the game is not predictive so more realistic experience.

2. Literature Survey

There was a man Jiawei Jiawei Li and Graham Kendall "A Hyperheuristic Methodology to Generate Adaptive Strategies for Games". Then further the game were analyze and many combination were tried to make them work efficiently. There were simple games like chess and card play at that time. Then there was a time were heuristics algorithm (approximate algorithm were taken into account for every sort of game at that point of time.

This method provides a efficient and high quality of solution for the problems. It was of two types i.e. Heuristic Selection and Heuristic Generation

Then SebastianRisi and Julian Togelius, threw a light on computational intelligence in video games, by giving paper on "Neuroevolution in Games: State of the Art and Open Challenges", but still the field was developing with the time and needed advance adaption. Later on developer took a look at the way to automate the playing, design. So because of this neuroevolution (NE) comes into play which refers to the generation of synthetic neural networks using genetic, algorithm. Numerous existing packages in games or even more ability applications.

Richard Mealing and Jonathan L. Shapiro tried to, threw a light on computational intelligence in video games, by giving paper on "Opponent Modeling by Expectation–Maximization and Sequence Prediction in Simplified Poker". In a -player recreation with perfect facts (i.E., where each player is aware of all earlier events), together with backgammon or go, the optimal strategy is deterministic. It can frequently be learned with conventional methods along with backwards induction. Poker, however, calls for you to be unpredictable to play optimally (e.G., with the aid of bluffing), which can simplest be expressed the use of a "mixed strategy" inside the language of recreation theory. The trouble changed into

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that of getting to know an effective approach online in a hidden data recreation towards an opponent with a converting method.

The movements of a normal opponent will supply warning signs of its hidden information, e.G., regularly making a bet with strong fingers and folding with vulnerable arms.

Greg Foderaro gave a video game called Pac-Man in that game the creature has to go throw the routes without touching emeny is the contact happens with enemy he dies .this game was level wise game in which scores were taken into account.

Maite Frutos-Pascual threw a light on computational intelligence in video games, by giving paper on "Review of the Use of AI Techniques in Serious Games: Decision Making and Machine Learning" .After this the gamming performance and gamming world took a long jump in advancement of the gaming field.

3. Existing System

There was a time when gaming was not taken as a carrier so there was no proper gaming algorithm was used and the algorithm which was used was predictive and makes the game boring and less attractive. There were same levels with not that much difference.

4. Problem Statement

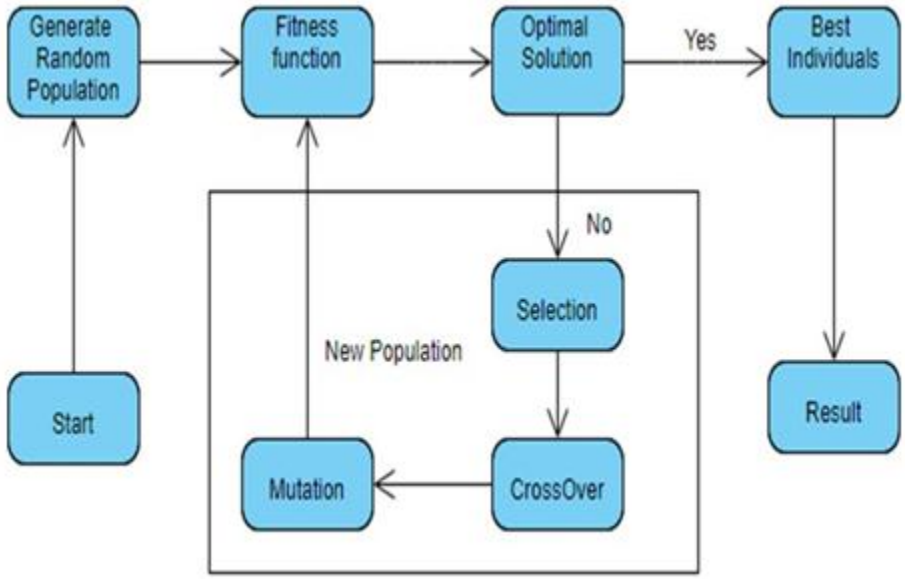
Creating AI individual for video games and match the gamer requirement.

5. Proposed System

Genetic algorithm is taken from Darwin's law ,which is survival of the fitness and self reproducing to better result for next generation.

i. In this algorithm the survival of fitness is taken into account for next generation.
ii. This algorithm has a method of giving the best solution when it is used on larger set.
iii. This method does not give assurance of the best solution in one generation.
iv. The method is used for handling complex operation in this world.
v. The reproduction take place for best solution of any specific situation

System Architecture



System Architecture

Selection Stage

In this stage the choosing of two of chromosome is taken into address and a result of this generation is passed to another generation for further use. The choosing is random and does not repeat afterwards.

Crossover

The generation is mixed with each other so that the best generation is taken into account for further used. The process is called as Crossover where the generation are mixed with the previous best generation

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Mutation

In this stage the result of the previous stage is taken into account and the product of last generation is passed to new generation so that fitness of program is achieved.

Stopping Condition

After a successful run of the program the child, which is the best solution, the algorithm stops and give the best solution.

Modules Used

A. TensorFlow

It's unfastened and open-supply library used for records and differentiable programming across various assignment. Mathematics library, and is also used for machine learning programs. There is trendy expectation in the industry to have enjoy in TensorFlow to work in machine getting to know.

B. Keras

In keras it provides Neural Network collection of library which is coded in python. It effectively works on various platform like tensorflow. Its designed in such a way that the speed of the experiments increases with learning of deep neutral networks. Chollet also the writer of XCeption deep neural community mode.

C. Sequential

There are stack placed in linaer way to create models. The above module is supplied by Keras. There is always layer of pair. Model should idenitify what input form its needs to process.

Algorithm

Start-
Step 1- Identify the most appropriate population.
Step 2- Give everyone a specific number.
Step 3- Start the cycle and allow it to run.
Step 4- Take the best solution of the run of previous step.
Step 5- Take the solution a Parent.
Step 6- Cross the parents each other and take the best solution.
Step 7- Produce a new set of population.
Step 8- Check technology is in shape:
Step 9- break;
Step 10- else:
Step 11- Start again step 2.
Step 12- Output the best model End;

6. Results & Discussion

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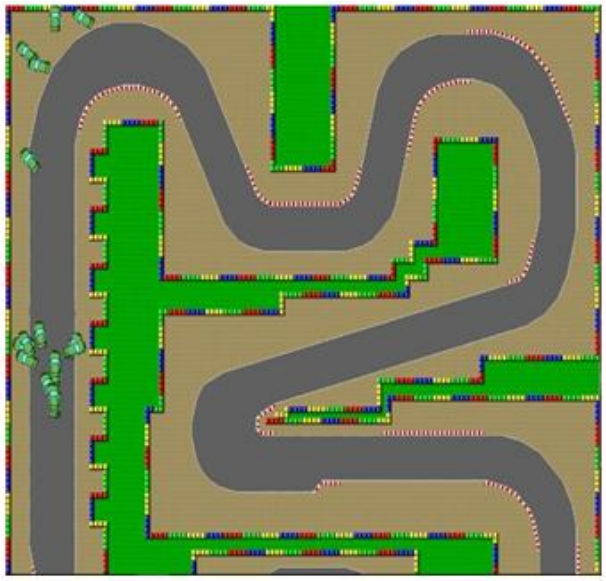
Car Race



Race Track for the Car

In the car game the car tries to run through the circuit without touching the boundary and when its touches the boundary and obstacles that generation best solution is used to next generation and so on the process continue after few generation cars manage to pass the track and fitness solution is taken in account.

7. Conclusion and Future Work

In the game approach is to create a character that evolves and find the best solution. As the progression does not stop so the game is engaging and efficient. In future this method can be used for various other games and it can be applied in 3 D games too.

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