GSOC PROJECT PROPOSAL NeuroEvolution of Augmenting Topologies

About me

Name : Reem Gody

University: Cairo University, Egypt

Field of study: Computer Engineering

Date study was started: September 2014

Expected graduation date: August 2019

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Interests: Deep Learning - Reinforcement Learning - Artificial Intelligence - Game development

Programming languages

Language	Experience level	Years of coding
C++	3	4 years
Python	3	5 months
Java	3	1 year
Javascript	2	1 year

Relevant work

I have been recently interested in machine learning, deep learning and Reinforcement learning. I have studied pattern recognition at college. I am currently studying Data science.

I also like to improve my skills in those fields by taking online courses. I have watched a large portion of Deep learning.ai by Andrew NG on you tube. I have as well joined pytorch scholarship on udacity. I also read a lot of the articles and tutorials on Medium on miscellaneous topics in machine learning and deep learning.

Project proposal

I am really interested in adding NEAT to the mlpack code base. My plan is to write an api for NEAT and test it on a flappy bird agent. I will divide the project mainly into 4 phases: mlpack code base exploration phase, research phase, API implementation and testing phase.

mlpack code base exploration phase

This is the phase of the project that I am currently working on. I have started by cloning the repository and building it from source. I also tried to help people with build issues on the repository. The next step in my plan is to test the code samples and the ANN api, so as to get familiar with the library.

Research phase

I have already started this phase as well and started learning about NEAT by reading articles on Medium. I also started to explore other NEAT APIs, so as to get more familiar with the required functionality. I also gathered some resources that could help me on the development journey including similar python modules , github repositories, and recommended books for explaining neat. I believe that I could refer to these resources in addition to the original paper for NEAT, so as to get a better understanding of the required functionality. A list of these resources is presented below:

1- https://neat-python.readthedocs.io/en/latest/installation.html#about-the-examples

2- AI Techniques for Game Programming by Mat Buckland

3- https://github.com/michael-iuzzolino/FlapPyBio

4- https://github.com/Brennan-M/FlappyBird_NEAT_GeneticAlgorithm/tree/NEAT_Master

API implementation phase

I will divide this phase into two sub phases. In the first phase, I will write the code skeleton with all the necessary functionalities based on my research. In the second phase, I will implement each function.

Testing phase

In this phase, I will test the functionality of NEAT on a flappy bird agent, to make sure that everything is working correctly and that the API is user friendly.

Timeline

March 28- April 30	Mlpack code exploration phase and experimenting with the library.
May 1 - June 2	Final Exams at college
June 3 - June 10	Reading the NEAT paper and understanding it well
June 11 - June 28	API implementation
June 29 - August 7	Testing phase