

Stack Overflow is a question and answer site for professional and enthusiast programmers. It's 100% free, no registration required.

Take the 2-minute tour ×

neural networks in realtime

CAREERS 2.0
by stackoverflow



+



Have projects on Codeplex?
Import them easily to your profile

In short: Is it possible to have neural networks react to user input in real time?

Imagine a little game with a world that consists of entities that receive inputs of their surroundings and generate outputs using a neural net to achieve survival. The entities should have some sort of ability to kill and consume another entity to prolong a hunger countdown which eventually leads to death, hence trying to survive as long as possible.

A simple solution to this is using Genetic Algorithms to improve the neural nets and find a set of entities with increased survivability (fitness for this case).

Now if the user should be able to have control over one such entity, the system breaks since he obviously outsmarts the entities due to their nets not having trained for dealing with the user's actions. This behavior can be achieved by letting the user replay the game many times until the neural networks adapt but it is a too tedious and time-consuming process for my goals.

Hence my question: Is it possible to increase the learning speed of the neural networks so they can react to user input fast enough so the user can feel the change happen? Or are there different approaches to have a learning AI improve based on user actions in real time?

[artificial-intelligence](#) [neural-network](#) [mathematical-optimization](#) [genetic-algorithm](#)

edited Mar 16 at 12:53



Ali

18.4k 5 56 117

[add comment](#)

asked Mar 16 at 0:54



nOvoid

10 3

1 Answer

Well, at the fundamental level the question is, "yes, it's possible to manipulate neural nets very quickly." Even with large NNs, you're fundamentally dealing with updating a set of floating point numbers, which is hardly a challenge for modern hardware.

So in the body of your question you ask about learning speed, but again, at the fundamental level we're still talking about floating point algorithms: more complex now to incorporate your learning rule, but still probably well faster than human perception.

So the question I think you're *really* facing is probably "is it possible to generate *training* data in real-time?" And that becomes hard to answer without considerably more detail. What is necessary in order to train your neural networks to do better? Is it necessary to rerun a complex simulation or is it sufficient to tweak some input parameters?"

When you say that you're using GAs to generate the NN weights, that makes me suspect that you're talking about larger data sets and complex testing in order to create a "better" set of NN-based entities. So, is it possible to do *all that* at human perception time? That's considerably harder, especially since the solution that starts to make sense is distributing the calculation across multiple machines (e.g., Hadoop), but that starts to definitely get into the realm of seconds, not milliseconds.

answered Mar 16 at 8:35



Larry OBrien

5,053 14 50

You are right about me facing the problem of training data generation and i tried to hint that but i assume i prioritized wrongly. The amount of data and testing time i am talking about doesn't necessarily have to be all that large though, my concept should be able to work with just very small amounts of entities, maybe making

7/1/2014

artificial intelligence - neural networks in realtime - Stack Overflow

GA a bad choice to train them. Still, what i want is the user's actions to have impact on the behavior after the shortest possible time. Imagine another user would control the other entities, he would understand the threat and try to avoid it. Thats what i want. — [nOvoid](#) Mar 16 at 13:16

[add comment](#)

Not the answer you're looking for? Browse other questions tagged [artificial-intelligence](#) [neural-network](#) [mathematical-optimization](#) [genetic-algorithm](#) **or** [ask your own question](#).