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CS 344 – Artificial Intelligence – Homework 4 – Part 1

Deep Neural Networks – Bust or Breakthrough?

Given that machine learning is one of my areas of interest for graduate studies, I sure as hell hope they aren’t going to be a bust anytime in the foreseeable future. In my humble opinion, I believe deep neural networks still possesses significant potential for growth and research.

What I really want to see are MMORPG’s (massively multiplayer online role-playing games), such as the classic example of World of Warcraft, that implement some form of advanced Artificial Intelligence. Given the current state of that genre, AI is pretty limited in those games to scripted behavior that rely on very simple decision trees in the background. It’s one of the reasons I don’t find MMO’s as fun as sandbox open world RPG’s like the Elder Scrolls 5: Skyrim, despite the sometimes god-awful “Radiant AI” system that governs the NPC’s. You would think a Non-Player character should at least be able to path-find around a boulder the size of a shack. Then again, Bethesda’s not known for its software engineering skills.

I would love to feed a neural network all the 3d models of rock in Skyrim as a training set and see if I can get the network to accurately predict what constitutes a “rock” or “not a rock”. Then, apply the resulting model to the NPC’s and see if they can now path-find their way around rocky outcroppings and not run in-place against a pebble on the ground.

Searching around Google a bit, I came upon an interesting article entitled “Neural MMO: A Massively Multiagent Game Environment”. Lo and behold, some researchers actually are implementing deep neural networks in the context of MMO’s. What’s even better, the article is dated on March 4, 2019, so it is recent. And far more wonderful is that the source code for their research is available on Github. I wouldn’t mind experimenting with this sometime in the near future.

Neural MMO is a “massively multi-agent game environment for reinforcement learning agents”. The description of this model states that players (the agents) can join any available server (environment) that contains a procedurally generated tile-based game map of configurable size. The input is described “agents observe a square crop of tiles centered on their current position – including tile terrain types and select properties (health, food, water, and position) of occupying agents. The output is described as “agents output action choices for the next game tick (time-step) – actions consist of one movement and one attack”.

Now, if only theoretical research like this can lead to practical application in developing a living, breathing world in sandbox RPG’s and MMORPG's that simulate the living ecosystem we have on Earth. Then, I could become a NEET (“Not in Education, Employment, or Training”) and enjoy myself in a virtual environment 24/7. Just kidding. But hey, this still gives reason to believe that deep neural networks still have the potential for growth and research leading to more and more practical applications in our daily lives. So hopefully, this area of AI doesn’t die off till long after I’ve obtained a Ph.D. in computer science, published a few papers, and grown old and bald, barring unforeseen fatal circumstances.

URL: <https://openai.com/blog/neural-mmo/>