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CS 344 – Artificial Intelligence – Homework 4 – Part 1

Deep Neural Networks – Bust or Breakthrough?

I speculate that deep neural networks will last at least within my limited lifespan. Google, who we all know and love, use deep neural networks in standard features of their search engine, such as Google Images. If giant mega tech corporations are applying machine learning in their commercial products, I doubt it is going away anytime soon. Insofar as it remains profitable.

There is a steady stream of on-going research involving machine learning. As one example, my summer 2019 research with Professor VanderLinden. As another example, AlphaStar, the Starcraft 2 AI that is capable of defeating professional players. Perusing the deepmind.com blog I saw articles describing research on breast cancer screening via machine learning conducted by Google DeepMind Health. Apparently, Google acquired DeepMind a while back, which I was not aware of. Another post described how machine learning was applied to Google’s wind farms to predict optimal hourly delivery commitments to a power grid a full day in advance. So on and so forth.

With continuing improvements in technology, we will have access to more powerful CPU’s, GPU’s, more RAM/VRAM, etc. This will only increase the viability of machine learning as an established field with theoretical and practical applications. It will be more computationally feasible to train on models containing very numerous (deep) layers and a large number of nodes. At Calvin, we have the “Borg” super-computer with 4 Nvidia Titans. Tensorflow and other machine learning API are highly parallelizable and scalable. Keras, a more user-friendly API capable of running on top of Tensorflow allows for fast prototyping so even the average layman could become involved with a simple tutorial or two.

I believe that machine learning is still in its adolescent phase and has yet to mature. Anyone with a system with decent specifications could install the necessary software and train a machine learning model to predict something. This isn’t some prohibitively inaccessible field where you need millions of dollars and a Ph.D. from UC-Berkeley in order to get started. You don’t necessarily need a degree in Statistics to understand the results either. Google’s Machine Learning Crash Course will do just fine. In conclusion, deep neural networks should be a breakthrough that will last throughout the 21st century, if not beyond.