**Week 1 Homework**

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**What is AI?**

Robots are taking over the world! Well, I guess we can say that legitimately now and not be scared for our lives, like in the movies. In the past we have always seen Artificial Intelligence(AI) as something that was dangerous to us as humans. We could never really imagine what it would be like if we had robots controlling our lives. I hate to say it, but we seem to be there. Just take a look at everything and everyone around you. In some way or another, Artificial Intelligence is something that we are involved heavily in and are now beginning to rely on it. AI is on our phones, giving us the best accounts to follow social media. It is in our favorite shop’s websites, giving us suggestions of things we may need based off our purchase history. It is in our maps we use to navigate to our favorite destinations. AI is really in our lives, and we might not even know it. But it is not a bad thing. I can’t imagine life without it sometimes. If I had to pull out an old Thomas Guide, I don’t even think I would remember how to use it. Let alone if it will take me to my destination ion the fastest time possible.

AI, in the simplest form, is the process of making intelligent machines and programs(IBM). To me, AI is the process of making some machines intelligent to help with any kind of task. Sure Intelligence can be measured and might be something to debate on, but these machines are learning how to think like us, on purpose. These tasks it can help with can be a human task such as playing chess or checkers, or it can be a task related to help all scientists in the fields of finding cures for deadly diseases(Xie et al., 2022). AI can really be a game-changer if the data allows. Data is what usually help the machine to learn. Data is as important today as ever.

AI has allowed researchers in the study of Alzheimer's Disease identify potential drug candidates in the process for treatment(Xie et al., 2022). Imagine not having to live with the fear of a loved one getting AD. To me that is such a great use of one of the many use cases for AI. AI can be extremely beneficial in helping the world, whether it is helping to find a cure for cancer, or making better business decisions for a company. AI is something we all benefit from, worldwide.

**Contributions**

Some of the unique contributions to AI actually might come of surprise. Of course, some obvious may be Mathematics, Computer Science, Programming, Logic, and the likes. Machine learning algorithms rely heavily on Math. It is what can make the difference between an intelligent machine and just a normal computer. Which I guess is not really a surprise, being that math and logic go hand in hand.

But what if I said that Psychology and Cognitive Psychology attributed as well. Its not just about handing the machine a bunch of learning material, or data, and say “have at it”. Cognitive Psychology influenced the development of the way the machine learns. Simply put, the machine is told how to learn, and it replicates as best it can the way us humans learn. Scientist have studied the brain and its neural architecture for years, and now neural networks are the standard for machine learning algorithms.

Neural Networks are deep at AI’s core, and what it is replicating is the brains neural architecture. It uses math functions in the form of the brains architecture and makes it learning based off of each slightly modified neuron, so to speak. The researchers of AI will study how the AI algorithm works, called machine learning, then map that to the real neural architecture of a brain. So they can say this part of the machine learning algo is like the learning part of the brain, or the remembering part of the brain(Kar et al., 2022). Very cool stuff.

**Start of AI**

AI seems to really be a new topic when discussed, but has been around a very long time. It did not always start off as something very powereful, and also has a lot of relation and background to the ancient Greek Philosophers. But for the sake of this article, I will give you some cliff notes. In 1950 Alan Turing, condisdered a pioneer of AI, published his article *Computing Machinery and Intelligence*(Russel and Norvig, 2016). This paper posed the question whether machines can think. At this time, machines were programmed by the operator only and not performing any kind of intelligence. Also created the Turing Test to determine if a computer can demonstrate whether it can think like a human. In 1956, John McCarthy coined the famous term ‘Artificial Intelligence’ at Dartmouth College and later that same year Allen Newell, JC SHAW and Herbert Simon create the first AI software program(Russel and Norvig, 2016). IN 1967 Frank Robenblatt creates the first computer that “learned” through trial and error. He used what is known today as a Neural Network, which is at the base of today modern learning algorithms(IBM). Fast forward to today and neural networks have evolved to deep neural networks and convolutional neural networks. These are used with very efficient machines that can handle running these algorithms as it takes up a lot of time and resources. By efficient, we mean a computer with a lot of hardware computing power. Very good graphics cards, a lot of memory in the machine, and intense capable processors. However, we can still perform AI on our own personal machines, just not at the level what a lot of researchers are using.

**Conclusion**

AI can seem a bit futuristic and maybe even dangerous for some people. But when you look at its past, and see the way it has been developed and is moving forward, I honestly don’t believe there is anything to be afraid of. Researchers in AI take the time to make the machine learners as ethical and elite as possible. They are using the most highest code of ethic and actually do not give the AI machine the ability to make decisions of its own(Fenner, 2016). Of course, like many, I am sure some will try to use AI for some kind of crime or demise, but that is the world that we live in and a topic for a different paper. With everything AI has done and is showing that it can do, I am very excited to be a part of AI. I still don’t know what I can help with, but at the rate that AI is going, it is only a matter of time before AI touches another big genre. With things like ChatGPT and new picture AI generators, it has changed the way we do things for the better. I personally us ChatGPT as a personal tutor. It has its flaws, but it is getting better. I just hope to contribute and make changes in the world for the better as so much already have.

**References**

Fenner, M. (2019). *Machine Learning with Python for Everyone*. Addison-Wesley Professional.

IBM. (n.d.). *Artificial Intelligence*. Retrieved from <https://www.ibm.com/topics/artificial-intelligence>

Kar, K., Kornblith, S., & Fedorenko, E. (2022). Interpretability of artificial neural network models in artificial intelligence vs. neuroscience. *arXiv preprint arXiv:2206.03951*.

Russell, S., & Norvig, P. (2016). *Artificial Intelligence: A Modern Approach* (3rd ed.). Pearson.

Xie, C., Zhuang, X. X., Niu, Z., Ai, R., Lautrup, S., Zheng, S., ... & Fang, E. F. (2022). Amelioration of Alzheimer’s disease pathology by mitophagy inducers identified via machine learning and a cross-species workflow. *Nature Biomedical Engineering*, *6*(1), 76-93.