

Individual Capstone Assessment

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My senior design project is exploring and researching the creation and application of Generated Adversarial Networks (GANs). GANs is where two neural networks are trained to compete in a zero-sum game, training off each other from only one initial training dataset. This is a large branch of artificial intelligence and will give a good introduction into how AI can be applied. I hope to expand my knowledge of neural networks, data structures, and AI in general. This project may also expand in scope as we apply some research we find and see just how easy or difficult is it to work with GANs.

In terms of guiding my work through this project, schoolwork has given me a great background in plenty of areas to start with. As noted before, neural networks work heavily from knowledge gained learning data structures and how the nodes of the network functions. Interpreting trainings and output data will also require a huge amount of database knowledge and linear algebra. A huge portion of the network calculations and data processing will also require math logic and discrete structures. Overall, much of the math and functional logic learned in higher level computer science should be applied to this project well.

As for co-op, the first and most impactful experience learned from my co-ops that could be applied to this project is the workflow and work discipline. Through co-op, I've learned how to set a good workflow and source control using git and many tools for productivity. A large part of workflow productivity was learned through co-op, which also includes personally preferred editors, OS, and so many small settings to make work easier for myself. Much of my co-op was front facing products and web development, which may also be used to present our findings. Many of the things learned and could be applied to working on our project may seem small but will continue to help me be as productive as possible. These can also assist when working through any technical problems I may have when trying to work with other people's code.

Our project is very interesting to me, though I have almost no background in AI at all. Once I read the description and investigated what GANs really is, I knew I was interested, as I've always wondered what it would be like to force neural networks to train off each other's data. The concept has always been an idea in my head, but I didn't know it was put into practice and had a name and plenty of applications with image generation already. AI has always been a bit intimidating but very intriguing to me, and I didn't think I would be doing anything with it in an undergrad, but why not seize the opportunity? Though the lack of background may be a hurdle to get over, the interest in the topic is personally the main driver in this project. I also hope this project can be expanded upon to capture more interesting concepts as we get deeper into more research.

In terms of expectations and criteria for completion, it's a very difficult thing to evaluate. When our neural networks generate data and train off each other to generate data that may looks like

it was human generated and look like what we are looking for, that's when we should be satisfied. With something as vague as that though, we could never be satisfied, so I hope to get data to a point of looking human enough to another human. With that accomplished, I feel like we as a group will have gained a huge understanding on how neural networks are set-up, trained, and how exactly they generate their data. I also hope to learn more useful kinds of data structures that may be used in AI, as well as how (or if) they can be used outside of AI. This project should serve as a good stepping stone to learn higher levels of computer science, especially when in terms of AI and all of its up and coming applications.