Daniel George

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Hello,

I’m applying to Waymo as a Software Engineering Intern in Machine Learning Infrastructure, hoping that I can bring my passion and experience to a cutting-edge, impactful project at Waymo. I’m excited to build machine learning tools that can be used across the company to analyze real world data.

I gained Machine Learning experience making a [neural network](https://github.com/dangeo314/neural-networks) to classify handwritten digits from the MNIST database. I implemented a feedforward neural network with backpropagation from scratch using only NumPy as a dependency, to classify digits with about 95% accuracy. This project stretched my math and programming abilities, and it gave me a solid foundation to learn more about deep learning. My goal for in the coming months is to learn a Machine Learning Framework like TensorFlow and apply it to a more complex ML problem. I think this familiarity with the basics of machine learning will prove useful in this position.

Another way I got to apply my programming skills to real world problems was as an intern at UCSD’s Advanced Robotics and Controls Lab. My team’s project is developing a breathing robotic lung “phantom” (an artificial assembly to mimic a human) which would act in place of a human for lung biopsy. The part of the project that I enjoyed the most and spent the most time on is developing an automated method to find the pose of a marker attached to the phantom using the CT scan. This will allow the robotic system to get the position and orientation of the phantom in real space, which is important for repeatable testing and surgery planning. To do this, I had to implement numerous computer vision techniques. While I didn’t use deep learning for this task, the techniques I learned can be useful in data labeling or other parts of the ML pipeline. What I learned working on this project can help me better tailor machine learning solutions for computer vision. Even while this technique was only in the development phase, I made sure to write reusable and readable code. My mentor was able to use my code to solve a completely different problem, generating 3D models using a CT scan. I know that practicing writing clean, simple, and understandable code is an important skill while working on a big project with many other engineers. While doing research, I felt that I was constantly learning, whether I was just reading the documentation for a software library or diving into papers to learn about new algorithms for marker tracking. I know that I have a lot left to learn to make a meaningful impact at Waymo, and I know that my willingness and ability to learn will come in handy.

Working at Waymo has been a dream of mine for a long time – I am inspired by the mission towards safer, easier transportation. The mission towards Level 4 autonomy motivates me to keep learning more; hopefully I can contribute to this mission as a Waymo Software Engineering intern. Thank you for taking the time to review my application.

Sincerely,

Daniel George