Daniel George

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Hello,

I’m applying to Google as a Software Engineering Intern hoping to bring my passion and experience to a cutting edge, impactful project at Google. My recent programming experience includes writing a feedforward Neural Network to classify handwritten digits and using computer vision to find the position and orientation of markers in a CT scan.

I gained Machine Learning experience by creating 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.

Over the past year, I worked as a research intern at UCSD’s Advanced Robotics and Controls Lab. My team 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 is working on 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 3D space, which is important for repeatable testing and surgery planning. To do this, I had to implement numerous computer vision techniques using Python. Even while this technique was only in the development phase, I made sure to write reusable and readable code. My mentor was able to reuse my code to solve a completely different problem, generating 3D models from a CT scan. I know that 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 understand that I have a lot to learn to make a meaningful impact. I’m willing to put in my best efforts and utilize all that Google has to offer.

I think that my background using software to solve diverse, real-world problems would come in handy. It would be a dream come true to work at Google as a Software Engineer. Thank you for taking the time to review my application.

Sincerely,

Daniel George