Shuo Liu

202-378-4386 shuoliu9566@gmail.com

Dear hiring manager,

I am a PhD student in Computer Science at Georgetown University, and I am highly interested in your Software Engineer (New Grad) position. I am attracted to the potential and opportunities offered by the position and the challenging yet creative environment at Alchemy. I believe there is a match between the requirements and my qualifications, motivating me to apply for the position.

My current research topic is distributed algorithms, specifically, resilient distributed optimization algorithms, including fault-tolerant and asynchrony in the distributed system. For example, machine learning is usually an optimization problem. Imagine a system solving machine learning tasks involving multiple computers working collaboratively, and some of the participants might be faulty, caused by system failure or adversary attacks. I am working on designing resilient algorithms against these faulty participants so that they can still output usable outcomes, and showing how resilient the algorithms can be. As cloud computing becoming increasingly popular these days, this topic is gaining interest and attention from researchers. Research in this line of work involves mathematical analysis of algorithms and simulations of the algorithms with Python.

My other research experience of mine is my graduate thesis on social media privacy. I studied a type of privacy breach on social media websites, where an attacker could discover a user's hidden information through public information of the users that he/she is connected to. This research involved data collection, data mining, analysis, and creating a demo website for users to check their possible social media privacy issues. It is a part of a larger project in the lab and we used Python, Java, PHP, and other coding languages in the whole project.

In addition, My intern experiences introduced me to industrial-level software engineering. My internship at Google this year as a software engineer was a task of an internal tool evaluating the staleness of contents in recommendation systems. Specifically, I designed a measurement of staleness, trained machine learning and mathematical models to obtain the measurement automatically, analyzed the performances of models, and designed and implemented an internal tool to be used by other teams working on content recommendation. The project involves training and fine-tuning a LLM similar to BERT. The project was more application- and data-oriented, involved communication to understand needs, and differed from my prior experience. The project was mainly in Python, but SQL and R were also used.

My internship last year at Meta as a software engineer was a task on creating an intermediate verification step of transfer learning in an internal machine learning workflow, as a part of a PyTorch-like package. The verification step is conducted in parallel with resource allocation, such that early detection of input errors can save time. I was required to read and understand the related codebase, and design and implement the new step from scratch in Python. It also involved communicating and coordinating with multiple coworkers in different groups who owned the code related to this task.

Aside from study and intern, I have created a web application called Map Levels (https://github.com/tenpages/us-level) based on others work on GitHub, which went viral for a while. The app allows user to log their visits to states of the US or countries in the Europe, and sharing them. I have no prior experiences with JavaScript, but learned it during the process by reading existing code.

I am interested in software engineer intern opportunities in general, with interests in machine learning, distributed optimization, data analysis, data privacy and security, based on my previous experiences and coursework.

My training and experience during my pursuit of graduate degrees and intern experience allow me to positively contribute to the position. Thank you in advance for your consideration of my application. I look forward to hearing from you soon and I would appreciate an opportunity for an interview.