Midterm Report – Suning Yao

Background

I am working as a Software Engineer intern at the CoreML Device API team at Google Cloud. The team is the owner of ML Infrastructure Runtime & API.

My intern mode is hybrid.

Project

My project is called “Peer-assisted HashMap”. The task is to build a hashmap library, which can be used to share immutable memory objects easily among systems (peers) in an opportunistic way. This task may involve knowledge in the whole pipeline of ML infrastructure runtime & API. The tech stacks I am working on are C++, gRPC, and Protocol Buffers.

Challenges

1. Designing

Prioritize design, then write code. My initial thought was to write some code first before optimizing it, but that's not really the most efficient way to create a new library as well as a service.

In this project, we should prioritize the design and write the code after the design is completely clear and complete. So one of the important things I learned is to do the design of the interface first, and then the implementation. Also be careful to communicate in the process, otherwise even if you write a lot of code, it will need to be rewritten.

2. Building completely new services

In my previous projects or development experience, I basically modified and added new features based on existing code, while this time I was building a new service completely by myself. This posed a big challenge to my ability.

This project was completely unrestricted, which was instead the biggest constraint, as I had to explore many technical options and decisions on my own, as well as constantly communicate with my host to reach a consensus conclusion.

In the process of building brand new libraries and services, I also got to experience the end-to-end development process, which further challenged and enhanced my capabilities.

Successes

1. Onboarding

Since I did an internship at Google last year, I was familiar with the whole onboarding process and saved a lot of time in the beginning (all kinds of paperwork and documentation, identification, intern training, etc.). I think this helped me to get into the internship quickly.

2. Internal tech stacks

The internal tools and technology stack that Google employs is relatively unique and customized, and differs somewhat from what I employ externally. But also because of my experience from last year, I am used to using internal tools and technology stack.

I think this has made me more efficient, while allowing the overall project to move forward in a helpful way. For example, since my project is about HashMap, the underlying library, some quick lookups of internal materials and source code saved me a lot of detours, and I also quickly understood the need for the whole team to build the project.

Other experience during the internship

Since I will be graduating directly after this summer internship, I will need to do a lot of work throughout the summer in addition to the internship itself so that I can prepare for my full time job. Therefore, during this internship, I also interacted with many engineers and teams within Google to gain experience and connection.

I think this internship at Google in the Bay Area provided me with a lot of opportunities to participate in various technology-related activities and to broaden my professional network, in addition to the internship work itself.