

Gerd Bizi

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Summer I Reflection

My first summer in the Laidlaw Scholars Program seems to be defined as a period of immense growth for me in regards to organization, time management, self-directed learning and the need to maintain a healthy work-life balance. I worked at the Kim Lab at SickKids, and was under the supervision of my faculty advisor, Dr. Peter Kim, and my mentor, Victoria Riccio. My project was to develop a program that is able to automatically segment cells in fluorescent microscopy images and to calculate values like colocalization of different channels and the peroxisomal density of cells. This project was an extension of previous work that I did where I generated a dataset of around 2000 cells to analyze for colocalization.

First, I learned a very good lesson regarding the importance of organization, especially when dealing with big data. The data from my experiments and programs existed in various forms—excel sheets, MATLAB files, .tiff images, proprietary microscope images, and more. There was a lot to keep track of, and I found that I was resorting to novel methods of documenting my data and information, using resources like Notion to link my databases and the filepaths to where I could find my data. I also used GitHub as a global repository for my project so that my project was accessible from the internet and open-source.

Time management became a big focus of my research. I unfortunately fell ill twice during my research, once with COVID and the other time with the flu. I was also taking a course for school credit over the summer, which in total, amounted to me putting in long hours to do all my work everyday. This caused many backlogs and delays, which eventually forced me to start

cramming my work in order to finish. The sheer volume of work forced me to adapt to become a more efficient worker overall, and I got much better at time-blocking as well. Now, I notice that whenever I take a task upon myself, I always try to integrate it into my framework on how I see time, and how much time I should be putting into a task to get the result I want.

Doing independent research also exposed me to the difficulty of self-directed learning—it's not as easy as it seems. When pursuing more technical problems, there often aren't YouTube tutorials that can take you from A to Z to solve it; instead a lot of it becomes a game of trial and error. A big example of this was when I had to deal with trying to extract metadata from my image files to read them into my program. The documentation provided by the open-source project, Bio-Formats, by OME, was often lacklustre, and many resources that I found online had me looking at deprecated modules. I had to essentially look at the libraries and figure out what they did based on fragments of documentation and some level of intuition. This experience was excellent for me, in that every computer scientist, especially when using more obscure libraries, will deal with the issue of traversing through dubious documentation, and I feel that I've become a better programmer for it.

All these lessons tied in together for me in regards to maintaining a healthy work-life balance. The sheer volume of work was a burden that could have dominated me throughout the summer and taken every moment of my time away from me. At the same time, my project also helped me develop skills that allowed me to deal with a colossal amount of work while still having free time. I also found that trying harder to engage in the *life* aspect, whether it be grabbing coffee with friends, or taking my father out for dinner—the experiences made the

sometime monotonous moments of research bearable, and the exciting parts of it that much better.

I am grateful for the growth that I've had over the summers and I strongly believe that this growth will lead me to becoming a better researcher and leader in the near future!