

I took my first programming course at the University of New Hampshire in the Spring of 2018 and quickly discovered that I was among the worst programmers that I had ever met. I can remember quite well sitting down with my fellow physics undergraduates multiple times per week while they had to walk me through line after line of beginner level Python material. I could not bring myself to understand the logic of programming; of taking a task and breaking it down into a series of fundamental instructions to be executed by a computer. I figured that programming would be a skill like any other and come to me like playing guitar or writing music did nearly years earlier- proficiency would come simply with study and practice.

By the middle of the Fall 2018 semester I was still incapable of writing most programs for the course without the assistance of my peers and being early in freshman year, I was too afraid to seek help and office hours or lay my vulnerabilities out to any tutor. To make matters worse, despite having an underwhelming academic record, I had weaseled my way into my first research position in the Physics department at UNH, which was entirely based in numerical processing with Python. My ability to program proficiently was no longer just a matter of a few grades in the classroom but was going to be the basis of many career building skills – The stakes had been raised.

Towards the end of the semester, realizing that programing is not just a skill, but a thought process, I had crossed the first of many bridges. I had practiced and worked enough to keep my research position, and pass through my Python class with a reasonable grade. I continued that research project for another year and by the end of it, considered programming to be like guitar, one of my stronger skills. I eventually was able to use my skills to confidently present my research at the 2019 URC. By the time my junior year had started in the Fall of 2019, there was no task that I was afraid of, I would constantly ask my physics professors for extra programming assignments.

The goal of a higher degree came to light when I met Dr. Kevin Short in the UNH Math department. I started a project that involved the classification of musical instruments using neural networks. It seemed like every wall that I had scaled prepared me for this moment. All of the late nights working on numerical processing, data structures, music, mathematics and physics led me to this project where I could combine my three favorite things- programming, music, and physics. I am currently set to present the result of this project for my BS Physics senior thesis in December 2020.

In addition to working with Dr. Short, I had also spent much time working under the direction of Dr. Qiaoyan Yu in the UNH Electrical and Computer Engineering Department. Prof. Yu had further pushed me to become a better programmer and researcher as well, writing Python programs that simulated lower level cybersecurity threats. The icing on the cake was this summer, when I was given the opportunity to be a co-author on three scientific papers on my research. This was one experience that I am most proud of, and inspired me to want to continue doing such work in the future at UNH.