

I first got interested in programming when I had some spare time after #####, and decided to read a book on JavaScript. I was quickly taken in by the ease with which I could achieve things with code, as well as the constant stream of dopamine that comes from solving a small problem with every line of code written. I quickly moved on to C# and Unity and became fascinated with the theory behind game development, eventually creating a mobile game with a friend.

Though I didn't have the option to study computer science in school, I greatly enjoyed maths and its related subjects, being motivated as much by the joy of reaching a neat solution to a complex problem as by that wonderful moment when a understanding of a new topic suddenly clicks into place and new connections are made with everything already learnt. I went to two of the school's computer science related clubs, leading a session on JavaScript in one and picking up and interest for operating systems in the other.

I acted on this interest during the Covid lockdown, installing Arch Linux on my laptop and learning much through the extremely hands-on installation and configuration process. I then spent the lockdown learning about ML and AI, initially as an inevitable consequence of the Dunning-Kruger effect and later on the basis of actual interest in the both the maths behind the topic and the possibilities in its applications.

One of the projects I worked on at this time eventually became my EPQ, as I had high hopes and copious amounts of overconfidence – I had decided I would use my rudimentary knowledge of CNNs to conquer the stock market. My mistakes were plentiful, the most notable being a contamination of input data with the expected labels, which rendered over a month's work mostly invalid but taught me a lesson about data leakage I will never forget. Although I was woefully unprepared, I learnt an incredible amount, both about AI and about programming in general, picking up knowledge on valuable topics such as OOP and TDD. After over a year of work on the project, however, both in and outside of school, I admitted to myself that my attitude towards it had become akin to a gambler's attitude towards their next bet, and decided to move on. I had learnt most of what I could from it anyway.

I learnt a new language, Rust, which I used to build and publish a cli app to print Sun Tzu quotes to the terminal. I expanded my knowledge of Linux, learning to use Vim to write code faster. I got interested in NLP, writing a project to attempt to quantify a person's writing style as a vector. One project that I couldn't quite manage, however, was applying RL to a physics-based environment, as I found my knowledge of AI still lacking. I started reading scientific papers to hopefully make up for my missing knowledge and fell down another rabbit hole.

Computer Science research, as it turns out, is extraordinarily maths-heavy. Conceptually, I knew this already; of course, the maths behind cutting-edge computer science is hard, that's what makes it cutting-edge. However, experiencing it first-hand was still a wake-up call, as I realised the more I read that this was something one could only learn at a university; no where online was a tutorial good enough to encompass all the knowledge I was missing. This realisation is what finally bridged the gap between my love of programming and my love of maths, as they had been drifting apart in my mind; programming was the useful thing I learnt from the internet, and maths was the fun but abstract thing I learnt at school. Now, however, I saw the two united to achieve things as advanced as anyone could imagine, in formulae beautiful even despite my lacklustre understanding of them.

Now, I am more motivated than ever to study computer science at university, and also to do well in my school subjects, maths specifically. One day, I hope to achieve the inspiring level of expertise required to not only understand the highest levels of mathematics, but to apply it to solve problems previously written off as "unsolvable" or "impractical".