

It is the year 2008. You have driven over 30 minutes out of town, the road is no longer sealed, and you are literally surrounded by forest. You finally reach a small brick house. Looking around, you realise that there are few other signs of civilisation - no mains power, no mains water, no neighbours. You look into my room, expecting to see me studying or playing video games. But at the same moment that you realise that I am not there, you become aware of the sounds of hammering near the edge of the forest. It is my dad. He is fixing a fence, and I am there helping him.

That was my childhood, and it shaped who I am today. My motivation, my curiosity, and my creativity can be traced back to the circumstances of my upbringing. I grew up understanding the importance of working hard. Every day after school my sister and I were fortunate enough to have Japanese lessons with our mum. This continued almost every day, from the beginning of elementary school to the middle years of high school, with the result that today we are both good Japanese speakers. However, working hard did not just mean studying. We were also expected to help with farm work. Most days we had normal chores around the house, but depending upon the season, I also helped harvest macadamia nuts (our main cash crop), pruning fruit trees, or helping maintain our hydroelectric generator. Because we lived “off the grid”, our family lived very conservatively power-wise, resulting in restricted tv viewing and other electricity hungry activities. Accordingly, I never had gaming consoles, being encouraged to read or pursue other hands-on activities. This upbringing has helped me become a person who knows how to apply himself to the task in hand. These days, I put much time into my research and studies, but I also maintain a healthy lifestyle.

Before starting University I attended Whangarei Boys’ High School. There were approximately 300 first year students (average age 13) separated into around 10 streams arranged by entrance exam scores. However, only the top streams received high quality teaching (but see below), the rest having to make the most of what was a bad situation. As a result, the future prospects of many of my fellow students were being clearly limited. Because I was fortunate in being able to understand my studies quickly, I often helped others in my cohort with mathematics and science.

In my second to last year of high school, my physics teacher was clearly unable to competently teach the class. (If this criticism seems unduly harsh, I should point out that high school education in New Zealand is presently in crisis, with many schools about to enter 2019 with unfilled teaching complements, particularly in mathematics and the sciences. These problems have been years in the making, and were present during my high school life.) In my situation alluded to above, because my classmates were not learning anything, a friend and I decided to teach the class. During each lesson we walked around the classroom, helping the other students and controlling the learning pace. I tried to make sure that everyone was understanding the concepts. This gave me valuable teaching experience, and I have continued to tutor students throughout my university studies, both as a private and formally-recognized Department of Mathematics tutor.

Other notable occurrences during my school years were visits of “Willing Workers on Organic Farms” (WWOOFers) from all over the world, volunteering their time working in exchange for accommodation and meals. In the evenings, my sister and I would spend time with them, conversing or playing games. We had workers from Japan, Germany, Argentina, USA and England, to list a few, from a broad range of backgrounds. They all provided something different - some even taught me mathematics! But their main influence was to fill me with curiosity about culture, science, and the world as a whole. They made me realise how many life opportunities there are and how much there is to learn. As a result, I grew up wanting to live a life that inspires people in the same way that they inspired me. I was also fortunate enough to travel to Japan on multiple occasions, which reinforced my bi-cultural heritage (New Zealand and Japanese), as well as visiting and travelling in the UK and Europe.

How does any of this relate to mathematics? Whilst working hard and meeting people from far and wide has helped me develop into an aspiring academic, when it comes to mathematics in particular, I believe my artistic side has played a larger role.

Anyone can learn the rules of mathematics. However, when it comes to actually doing mathematics, one must have the imagination to solve previously unsolved problems or even devise entirely new areas of mathematics. It turns out that my upbringing catered for this perfectly. I had not so many toys growing up, so I spent my free time creating worlds. I drew imaginary maps - close up maps of cities showing streets and buildings, maps showing entire countries, drawings of landscapes, and even flags and national animals. Creating mathematics is a similar process, which may take months or years working with a pencil and paper, thinking about a problem from different angles and attempting to develop it into something complete.

Throughout my childhood I applied this process to drawing, and now I am applying it to mathematics. I also spent a lot of time creating art for art's own sake. I always strived to create the most visually interesting images on my canvas. To me, this meant mixing and matching aspects of life and geography that at first sight may not seem to belong together, for example, disproportionate images, or images collected so as to present a larger totally different perspective. Modern problems in mathematics generally require pulling together mathematics from multiple distinct areas. Through many years of pulling together concepts that do not appear to belong together, I have honed this way of thinking.

My background differs greatly from that of many of my contemporaries, and I believe that it has provided me with a unique perspective and much to offer. In particular I have an understanding of how someone's life can be heavily influenced by their early educational experiences. While I wish to contribute to mathematics during my time at UC Berkeley, I also hope to contribute to the diversity of my cohort and to learn more about different cultures from my cohort.