From a young age, I’ve always been deeply interested in virtuality. It was video game, making all the impossibilities possible that first sparked my interest in cs. When I was 14, by the inspiration of an anime called “Sword Art Online”, my foremost dream was always to create a virtual world, the so-called “second world”.

To fulfil my dream, I believe that a solid foundation on cs knowledge is required. I looked for resources online and started to target algorithms. My starting algorithm were sorting algorithms. The details contained when turning the straightforward pseudocode was quite challenging at the time. As I study further upon algorithms, the precise logic behind each of them can always seize my attention.

The most significant part throughout my journey on cs must have been my research done on neural network. The research started when I failed to solve a maze using only DFS since I ignored identification of the maze for the computer. After simple navigation online, I locked my research direction on the simplest artificial neural network multilayer perceptron (MLP) that can recognize simple digits. The whole model contains 2 main functions, feed forward function that makes the estimation of the digit and a cost function calculating values to indicate the performance of the model so the model can be optimized. Understanding the structure and the feed forward process was not hard. But when it came to optimization, things started to get increasingly abstract. For a normal visualized MLP model, there can commonly be over thousands of nodes spread over 2 or more layers. Forward feed function takes an input with size equal to the number of nodes and is parameterised by the size all nodes in adjacent. For cost function, its size of input is already same to the former, but its size of parameter depends on all the tens of thousands of training sample that is way bigger than the former. This sophisticated amount of parameter made it hard for me to consider how gradient descent and back propagation can be used on them, what is more, how ineffective can it be when the computer deal with so much amount of data? From the book “Deep learning” published by MIT, I found batch, mini-batch and stochastic gradient descent algorithms. As my final understanding of the algorithms, in a program of the whole model, the code for feed forward function and cost function will be nested within batch algorithm. Where for each batch, both functions will run until the error is less than the threshold value set. At the end, although I failed to use any of the things from research and I spent a whole night drawing the maze using StdDraw class in Java since I went overboard. But the whole process really sparked my interest in Machine learning and cs.

Besides tests and papers, I shaped myself to become a better student and at the same time a better person in variety of ways. The opportunity to become house leader (our whole middle school split into 4 houses) and one of the student representatives in school fostered my leadership and the ability to communicate and cooperate. My persistence to sports not only helped me to set many school records during sports days but also trained me with my time-management and what’s more, teamwork. Additionally, to find a clearer connection between knowledge and real-life, especially computer knowledge, I spent much of my leisure time on robotics. To challenge myself further in robotics, I participated in some world-wide robotic competition and won gold award, which the whole process solidified my understanding to the linkage between knowledge and application

With the hope to achieve my dream, apparently, the resources online is not effective enough both on their quality and quantity. As I become a cs student who can fit better into campus in multi-aspects. I believe with an opportunity to become a student in one of the most outstanding institution can guide me to the correct path on cs, which can make it possible for me to realize my dream one day.