Since childhood, I have had a strong interest in numbers. When walking on the street, I quickly calculate the sum of squares of the five digits on a license plate and then factorize it into prime numbers. As my mathematical knowledge has grown, its magic and beauty have always captivated me. It amazes me how a messy polynomial can be transformed into a product of several polynomials, or how the sum of an infinite geometric series can be expressed as such a simple fraction.

I was once trapped

In recent years, with the development of computing power, data science based on big data has been applied in various fields. During my spare time, I took an introductory course in data science and collaborated with my classmates on a case study involving the identification and categorization of coins using computer vision techniques. We published a paper on this topic. Through this case study, I gained a comprehensive understanding of the application of data science, from data collection and classification to building neural network models and performing data analysis using Python programming. While marveling at its power, I became more interested in the mathematical principles behind the neural network methods used.

I discovered the intrinsic link between CNNs and underlying mathematical theories especially matrix. CNNs heavily rely on matrix operations, such as convolutional filters, which extract features from complex datasets. Related mathematical principles like linear transformations and matrix factorizations underpin the efficacy of CNNs. I first studied matrix during my ACT course and didnot find it very interesting but during the big data project I am amazed by the powerfulness of it and would like to learn more about linear algebra systematically.

Another example that made me marvel at the power of mathematics is the Space City Competition I participated in. This competition is a global event organized by NASA and consists of regional, continental, and global rounds. In the Asian regional finals, we were tasked with using the Lagrange method to calculate the position of the perigee. The principle behind the Lagrange method is based on the condition of force equilibrium for a mass in a potential field. Our team utilized mathematical modeling and equation solving techniques to determine the location of the Lagrange points during the competition. Concepts such as potential functions and integration methods in mathematics played a crucial role in practical applications, once again highlighting the strength of mathematics to me.

我最喜欢的一本课外书是数学之美：

In my spare time, I enjoy building various models ranging from robots to paper models. It's fascinating to take a pile of scattered materials and assemble them into a cohesive whole or transform a stack of paper into an airplane or a battleship. It's akin to solving an algebraic equation by following logical sequences. I often find myself engrossed in this work from morning till night, sitting in one place until I am satisfied with the final outcome.

As I accumulate knowledge, I have come to understand that mathematics plays a fundamental role in various fields, such as physics, engineering, as well as social sciences like economics and finance. In the future, I aspire to follow in my parents' footsteps and pursue further studies in mathematics at a university in the United Kingdom. I aim to apply mathematical principles to the field of data science and other domains. Ultimately, my goal is to continue enjoying the pleasure that mathematics brings to my life.