

Computer science (CS) studies require abstract thinking and practical problem-solving skills. Hence, CS students usually need strong theoretical and technical abilities, which I have gained through my undergraduate education. For example, I am well-trained in mathematics, and the courses I have taken in the field have laid a solid theoretical foundation for understanding abstract computational propositions and designing complex algorithms. I am also skilled at computational thinking: I can connect theories with real-life problems and create computer programs to provide innovative solutions. Additionally, I am very passionate about studying CS because I know that CS will significantly impact my career and future life. Therefore, I feel confident that I will succeed in the Master's Program. I am looking forward to studying at University, where I can learn how to create web scrapers, manage databases, contribute to open-source projects, and research various advanced topics.

During my undergraduate career, I took many pure math courses, including Linear Algebra, Probability Theory, and Mathematical Statistics. These courses have prepared me well for studying advanced computer science because a wide range of methods used in modern computational research is based on mathematics. For example, in machine learning, knowledge from linear algebra and mathematical statistics is the basis for two key research methods: algebraic and statistical methods. Thanks to my proficiency in both areas, I will be able to find statistical explanations for the algebraic approach as well as perform algebraic calculations for statistical models. Therefore, I am confident in my ability to solve various theoretical problems during hands-on machine learning research.

Furthermore, the computational thinking skills I gained from my undergraduate education enable me to formulate a problem, express the solution, and evaluate the results. In my Mathematical Modeling class, my professor introduced a mathematical model for describing the stock market. However, I soon realized that the model was too simple to illustrate real scenarios due to the lack of time variables. Therefore, I supplemented his original model with an iterative formula to measure time, programmed equations into a MATLAB editor, and generated solution graphs. I was surprised by the results, which implied a potential contradiction with the professor's proposed solution. When I explained my findings to the professor, he was very impressed by my work. I plan to continue to capitalize on the strength of my computational thinking skills at Columbia to manage complex databases, practice classic algorithms, and apply my computer science expertise to solve real-life problems.

One of the primary reasons that I want to study computer science is my internship experience. During the winter break of my junior year, I worked as an investment research intern at a private equity firm, where I was responsible for collecting financial data and writing industry reports. I enjoyed this work and continued finding methods to improve my efficiency—I wanted to spend more time on data analysis and less on manual data collection. After visiting another private equity firm with my manager, I realized that I needed to learn computer science. At that firm, all of the data collection and analyses were done automatically by its data mining and machine learning system. Using this approach, the firm could spend more time communicating with investors to raise more capital. Although I later switched my career goal to economics research, I am still motivated by what I learned from my internship experience: in the 21st century, computer science will fundamentally change every industry and every one of us. As such, we must embrace computer science to gain advantageous positions for our careers.

Outside of the classroom, I enjoy hiking. During my three years in insert_place, I climbed many mountains in the area. Hiking can be challenging on steep trails because I am sometimes exhausted, only halfway to the top. However, I never give up. In these moments, I will take a rest, have some energy bars, and continue walking until I reach the apex and discover the beautiful scenery there. Studying computer science is similar to hiking in some ways: as a non-CS major, I may find some

CS courses challenging. However, with the patience and perseverance I have learned through hiking, I am able to overcome these challenges and master advanced computational techniques. As an international student, I will maintain full-time enrollment at my current university in order to attend the program if I am admitted. I hope to apply the computer science skills I will acquire at Columbia to boost my career development and achieve a better future.