Statement of Purpose

When making academic choices, I value interest and passion more than anything else. At the entrance of university, I chose USTC because it had the freest course selection and major transfer policy. I believe this freedom could help ensure that I'll be working on something that I'm truly passionate about. I intend to learn more about cryptography at the end of my freshman year and after talking with one professor working in this field, I decided to get transferred to the school of mathematics. For two and a half years, I studied fundamental math courses about algebra, geometry, analysis and optimisation. In my opinion, I not only gained a solid theoretical foundation from these courses but also got crucial training on reasoning and thinking. After that, I chose computational math as my specialisation with a hope to practice my computer programming skills more.

Speaking of professional goals, I primarily want to become a researcher in the future. It could be in the universities or the research department of technological firms. I love the intellectual challenge and the freedom to study problems that I'm curious about. What's more, doing researches also allows me to appreciate and interact with some of the most brilliant minds in the world. But I'm also curious about other potential jobs and I would be happy to experience doing practical work in companies and firms, such as things related to computer programming. I love the sense of achievement when you solved a practical problem or created fantastic results.

My experience in engineering can be dated back to my freshman year when I was in the engineering department. I took part in a robot contest held by our school. Our team constructed a robot doing traditional Chinese paper-cutting. We have a human input the detailed requirement of the paper cut using an intelligent voice interaction routine. Then the robot searches our database for the kind of paper-cutting closest to the requirement. We built the robot from scratch literally, buying single-chip microcomputers, welding wires and.writing programs. We even customised our robotic arms and made our robot look like Wall-E in the famous Disney film Wall.E. It was a fantastic experience to actually make cool things come to being by your own hands.

Then in my sophomore year, I began doing some interesting class projects and taking part in different contests. In our course: 'introduction to computing system', we learnt how computer programs are interpreted and carried out in our computing systems from a bits and gates point of view. We write instructions in binary language and watch it run in a simulated small computing system LC-3. It was so interesting. In our computer graphics courses, we implemented many algorithms regarding image processing and 3D reconstruction. Then at the end of the semester, we made a unity game. It may be far from research aspects of computer graphics, but it's quite inspiring as it shows what cool things you can do with all these results from computer graphics. I also took part in the ICM contest and constructed a model evaluating the influence of different factors on a region's fragility. We applied correlation analysis and the neuron network.

In my junior years, I started to get a taste at doing researches. I signed up for an undergraduate research program at our university and began working on a particular kind of transforms called AONT under the guidance of Prof. Zhang. The research mainly involves linear algebra and finite field. This experience helped me a lot in overcoming the fear of inadequate knowledge when doing researches. I find that you can't know everything before conducting research. You always learn alongside when doing research. Then in the summer of my junior year, I went on doing a summer

internship at NTU,Singapore under the guidance of professor Guo Jian. I studied the security of round-reduced versions of the Keccak hash function family and try to carry out more powerful preimage attacks. I learnt a lot about the importance of observing and accumulating experience in research. Sometimes, it could give you insight into later problems.

First of all, I am currently planning to study cryptography in the following years. I like cryptography more than anything else because I like its elegance behind complexity. I'm broadly interested in algorithms, modelling and symbolic calculation. I'm also curious about distributed systems. I have been admiring Laboratoire d'informatique de l'École Polytechnique for a long time. And if I could, I wish I could join this lab in the future. Besides cryptography, I'm also interested in the topic of big data computing and data mining. Nowadays, many machine learning or data mining methods are more like learning an index for searching and relying on deep learning to build a powerful model to understand the data. It is undeniable that this method is feasible, and it is also in line with the learning rules of the human brain, but I think what I should do is to use more mathematical or structural techniques to simplify the model to achieve truly simple and effective modeling.

Now I want to talk about my reasons for applying to École Polytechnique.

The first reason is that academically, France is famous for its work in math and physics. Every year, many of the students in our university would try to get in ENS and one or two could succeed. And I've constantly been hearing about fantastic books and inspiring works, and I do hope I could learn about it. However, due to the language barrier, I can't learn as much about their work as I do about researchers in English-speaking countries. Therefore, I'd appreciate it if I could get admitted to École Polytechnique and get a chance to know the academic research taking place in France.

Secondly, I'm attracted by the free course selection policy of engineer program in École Polytechnique. As a student who wish to transfer my study from mathematics to more applied area like computer science, an individualised study plan would perfectly suit my need. I also like the idea of an internship in the company. Although I'm currently planning to pursue a career in academic research, it's great to get in touch with the industry also. It gives me a taste of exciting things taking place in the industry so that I would be better informed when making career choices.

To sum up, I'm not only deeply attracted by the academic atmosphere of math and physics in France, but also impressed by École Polytechnique's study plan that best suits personal need. I would genuinely appreciate it if I could be given the chance to pursue my studies at École Polytechnique.