Personal Statement

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I have paid close attention to the subject of system engineering for a long time. My interest in system engineering originates from my own critical thinking. I read bibliographies from Edison, Bell, Lanchester... and after so many accumulations, I summarized that new creations are connection and reorganization from old objects. When I entered university, I learnt that system engineering is precisely telling you methods to link the collection of elements and proceed efficient manipulations. I tried hard to broaden my knowledge on the road of my interest, which is from vague to clear. Currently, my research topics ranges from operation research, game theory to statistics, communication and cryptography. And finally I'd love to solve system flaws in internet-based system communication.

In one of my first classes as a freshman. I completed a group project based on the idea "Internet of things" and after which I became interested in system engineering. A TED speech from Dr. John Barrett motivated us. He said "industrial internet brings together intelligent machines". Followed by his idea, we managed to connect the windows and other domestic devices with multiple sensors. Also we used Acrylic plate to construct the frame and applied Bluetooth to control. One of the function of our prototype is that as soon as the window detects rain, it will automatically close, and the lamb will turn on, the coffee cup start boiling water and after five minutes the alarm clock rings. I gradually felt the power and efficiency of "connection" from it.

At the same time, I watched "Open Yale Course: Game Theory" online and read a book "The Economics Naturalist". The Yale course provided me with critical thinking on decision making and competition strategy. For example, the theories of Nazi Equilibrium and Advantage of the First Mover influenced me a lot, even making me stand out from many pursuers from my later girlfriend. The book, similarly, opened a door for me on social marketing strategy without having to learn much economic concepts. To fully prepare myself with more systematic knowledge, I took a course "Operation Research" during my exchange period. As an electrical engineering students, I faced difficulties in understanding the advanced concepts, but through intense collaborative studies with my classmates, I soon found myself engaging with even the most difficult topics. I cannot overstate how enjoyable I found this course I even received 98.5 in an exam and acquired a final evaluation of an A.

In 2016 March 1st, Dubbed DROWN, a critical security hole in OpenSSL was disclosed. This deadly security vulnerability immediately affected more than 11 Million modern websites as well as multiple e-mail services. This shocking tragedy made me rethink the idea of system managing. The real purpose for managing a system may be creating a secure environment besides improving the efficiency. The speed of destroying far outweigh that of constructing. The sudden affair also push me to focus on the security of internet-based systems. In the summer semester, I selected the cryptography course. To explore channels for secret sharing, I started to research in the field of Internet Communication. Followed by Professor Han, I began to research on the frame structures of TDMA scheme to help our research group exploring on the Medium Access Control protocol. With the experience from Mathematical Modelling, I can delicately do some Matlab programmings in a limited time. The publish of our first paper, which is introducing a new Memory Assisted MAC Protocol, provides us more hint on the MAC design on multi-band assisted MAC. Later on I started to compare the TDMA frame of GSM and that of 2.4GHz Wifi. And our research group transits towards designing MAC protocols on Terahertz band and Millimetre waves.

The university of Pennsylvania is the ideal place for me because of its interdisciplinary approach and its large number of faculty members who pursue research interests highly relevant to mine. I hope I will have a chance to research the topic "Information and Decision Systems" and study with Associate Professor Alejando Riberto and Professor Saswati Sarkar for Communication Systems and Wireless Networks. I firmly believe I will make substantive intellectual contributions and creative ideas to your program and hope that my efforts will serve my career goal of being an internet system engineer, designing efficient protocols and create secure environment for communication and information storage. It will be a great honor for me to join your program: thank you for your consideration.

For ESE Master's Program in University of Pennsylvania