**Applied Program: Electrical Engineering/ Automatic Control**

For twofold reasons I am sincerely grateful to my father who is also my mentor. First, it was he who distilled in me the impulse to adore those who can achieve success from apparently impossible situations. When I was plunged into great despondency for failing to gain admission into the nation’s most prestigious university at the college entrance examination, my father told the story about how General Wellington who, driven into a mountain cave, drew inspirations from a spider which was patching up its web and re-organized his troops to defeat Napoleon. My father made me convinced that I could be a successful person in my own right.

Second, I owe my heartfelt gratitude to my father for the academic interest that he cultivated in me. An electrical engineer himself in the field of industrial control, my father influenced me by encouraging my childhood interest in electricity. Unlike many other parents who simply buy their children electric toys and leave them playing with those toys, my father not only bought me many interesting electrical toys but also explained the inner workings that produced the sounds and the movements of those toys. As I grew up, he continued his enlightenment of me with his regular “professional lectures” concerning the more sophisticated electrical appliances in our daily environment. His education persisted until I chose to major in electrical engineering during my undergraduate program and came to regard it as a lifelong career objective to which I would dedicate all my intelligence and energy. From the undergraduate education I received at the Information Science and Engineering Department of Shenyang Institute of Technology, I derived useful knowledge from a wide variety of foundational courses in industrial engineering that included Analogical Electronic Circuits, Digital Electronic Circuits, Principles of Microcomputer, Electrical Power and Electronics, Single-Chip Microcomputer. In those courses, I achieved full marks or the highest scores in the entire grade.

My theoretical understanding of automatic control came with my studies of classical control theories embodied in such courses as Theory of Modern Control, Theory of Automatic Control, Procedure Control, and Computer Control. I also came to develop a relatively thorough understanding of feedback control and some methods of system design. With those understandings, I tried my own hands at designing and experimenting with a closed-loop feedback system. However, as I delved deeper into my studies, I came to discover that the classical feedback-based control theories could no longer meet the requirements posed by modern large-scale and complicated systems. Their challenges could only be answered by some database-based, intelligence-oriented theories. Therefore, I purposely self-studied some courses exclusively offered to graduate students—Artificial Intelligence, Neural Network, Self-Adaptive Control, etc. Although the theories incorporated in those courses could by no means work out all the problems in modern control, their effectiveness in improving production efficiency made me all the more determined to devote myself to the studies in control theories.

Various forms of control theory depend heavily on computing tools as represented by mathematics. Without exaggeration, I can say that both mathematics and computer application are precisely the subjects in which I excel. On account of my distinguished mathematical talents, I represented my institute to participate in the National Undergraduate Mathematical Contest in Modeling in 2000 in which I proposed an optimum solution to a steel procurement and transportation plan. In this contest, I won third prize in the whole Liaoning Province. In addition, I self-studied a number of advanced courses like Fuzzy Mathematics and Discrete Mathematics which further widened my horizon and called my attention to the possible trends of automatic control in the future. One of the most important achievements in my undergraduate program is that I spent one year and half doing coursework in the computer specialty as a subsidiary program in order to develop my comprehensive abilities and to improve my computer skills. In those compulsory core courses that are generally acknowledged to be fairly difficult even for computer majors, I achieved the highest scores in my class in Data Structure and Operating Systems. By undergoing systematic trainings, I have become quite familiar with computer hardware structure, working principles, and software programming debugging. I have also made independent efforts in program development by means of VB, VC, Foxpro and Delphi.

While attentive to studies in control theories, I also attached great importance to the application of theories to practical problem-solving processes because all theories must be put to the test of practices. Since the very beginning of my undergraduate program, I have closely followed the leading international and domestic academic journals in the field of automatic control and the important research papers published in those journals. As a sophomore, I started to help my father with some of his design projects. In the control system that he designed for a cement mixer, I introduced a programmed single-chip computerized controller which, after debugging, was put into application and received very positive comments from the user. For my graduation project, I designed The Automatic Monitoring System for Detecting the Temperature and Humidity of a Tobacco Plant. With the help of a PC and a single-chip microcomputer, I designed a 3-phase system in connection with the concentration-distribution system. Demonstrating obvious practical values, the system can conduct automatic monitoring of the environmental parameters in the four workshops of the tobacco plant. At present, I am working on an automatic assembly line in collaboration with an industrial control company. I am very proud to say that my overall undergraduate studies have proved immensely fruitful. In terms of the ranking of scholastic aptitudes, my ranking is top tenth among a total of 148 students in my grade and I have been award scholarships for quite a few times.

Even a most cursory survey of most factories in China would reveal that the overall level of automation in China’s industrial sector is rather low. Even when there is a limited number of “advanced” systems, they are mere copies of foreign models that are on the point of being outmoded by international standards. This indicates how China lags behind international levels of advanced technology. As we all know, the most important factors in automation are system modeling and analysis. It is essential to ensure, through analysis, the stability and optimum effect of the system even when there are many uncertainties. In this regard, we need cutting-edge technology and mature theories. Under such circumstances, I have developed the idea of seeking further studies in the United States where I can learn advanced and systematic knowledge about large-scale systems. In this way, I will be able to make in-depth studies concerning the mathematical models of the systems when I have the opportunity to face those increasingly complicated large-scale systems. Those studies will enable me to find out possible solutions to problems.

The Institute of Industrial Engineering of Purdue University enjoys a high academic status in the United States. The Automatic Control Specialty in the Department of Electronics and Computer Engineering covers a wide range of programs in Artificial Intelligence, Neural Network, Robotics, the Modeling and Analysis of Large-Scale Dynamic Systems, etc. The application of those important fields of knowledge will ultimately produce important impacts on the technological advances in automation and control. Those fields are also the areas in which I am very interested. I would like to apply for a Ph.D. program in automatic control. As a matter of fact, Purdue University is also the university from which China’s leading scientist Deng Jiaxian graduated. That is why it attracts me so much. A Chinese proverb says, “If you come to the most commanding height, you will have the greatest vision.” I believe this axiom applies to my case perfectly. By “the most commanding height”, I mean that an education at Purdue University will endow me with the most advanced theories and expertise in my chosen field. By “the greatest vision”, I mean that I will develop international perspectives that will enable me to look ahead into the future and keep up with the latest developments. My greatest expectation from the prospective degree program is that I can build up a firm foundation for a fruitful career in system designs.