**Applied Program: Mechanical Engineering**

I was born into a poor family in a remote mountainous village in Shandong Province. The untimely death of my uncle, who was very close to me, because of illness and poverty shocked me to such an extent that I once decided to drop out of the school and to help support the family. But my parents did not allow me to do so. Illiterate as they were, they nonetheless understood that "Education is the key," and were anxious to put this key in my pocket, in spite of all their difficulties. With the growth of age, I now have a much clearer sense of purpose for my life, which is not just to help one family, but to lift many more out of poverty and ignorance.

I remember that I proved to be a fast learner as early as at elementary school. For instance, I was the only one student in the entire school who could solve linear equations with two variables. At high school, my favorite subjects of learning were Mathematics, Physics, and Chemistry. Every year, I participated in national or provincial contests in Mathematics, Physics, and Chemistry for high school students, and won either a first or a second prize. With this kind of training, I gradually developed a confidence in my ability to compete effectively in any academic circumstance. In 1996, I entered the famed Tsinghua University as a student majoring in Precision Instruments and Mechanics, with scores at the National University Entrance Examinations ranking the first in the region and the fifth in the province.

In Tsinghua University I found the gateway to the beautiful garden of Mechanics. What I saw in its Micron and Nanotechnology Center, such as electric generators only a few microns large, and various laser devices in precision measurement, carried me away completely. When I learned that in near the future, Nano-electronics could produce pocket-sized giant computers, and make fragile porcelain ware exceedingly robust, and, especially, that Nanotechnology will play a central role in the development of Information Technologies, more than Computer does, my mind was made up to pursue a career in this exciting area, for the rest of my life.

During my undergraduate years, I built a solid foundation in the Basics of Precision Measurement, Material Science, Precision Equipment Engineering, and other related areas, earning excellent academic records. In addition, I made concentrated effort in developing a strong ability in lab research, especially during my undergraduate senior studies and during my Master's Program. I once designed a piezoelectrically driven micro-jet, following the idea of the spray mechanism of the ink jet printer with certain micro-mechanical processing. On the basis of this research, I invented a new model of micro-jet for lung treatment. During the several months of lab research and the writing of my graduation thesis "Experimental Research on Micro-jets," I learned a great deal about power electronics, microelectromechanic systems, silicon processing, and engineering mechanics, and significantly enriched my lab experience through dozens of lab testing projects in precision measurement, in areas such as the sugar thickness sensor, designs of precision mechanics, the appliances of microcomputer, the applications of multimedia technologies, and the use of the single-chip computer.  
  
Besides lab research, I also did part-time work with three companies, involved in the research and development of products of micro-mechanic systems, database, and the GIS. With these work experiences, I developed an ability to conduct research work in corporal environments, and also attained a keen insight into the practical and commercial sides of micro-mechanics. I applied my knowledge of MEMS to the preparation process of the micro-flow sensor produced by the company. For this project I looked up a large amount of technical literature, which also involved much translation for those who could not read in English. My English improved considerably, after many hours spent in the library reading IEEE publications. In this environment, I remain a fast learner, because I have learned how to learn, not just what to learn. I in fact learned some of the computer programming software, such as Visual Basic, Visual C++, and Delphi, on my own.

It was also during the lab experiments that I notice that most of the key equipments I used in the lab were foreign imports. Since the manuals that came with them often did not cover all the technical details of their internal structures, it made them rather difficult to operate. With this experience I began to realize that China is still way behind Western countries in the development of precision engineering. I wish to pursue a higher degree abroad, with a focus on MEMS, and especially on micro-mechanical systems. To my great surprise, I found that Arizona State University has a highly advanced graduate program in Mechanical Engineering, which will meet my needs perfectly. I have visited the web page of the university several times, and have some contact with Professor Ampere Tseng, whose research areas seem very attractive to me. Professor Tseng has in fact encouraged me to apply to its graduate program.

There remain some problems in the lab experimentation that cannot be solved with all the knowledge I presently have. For instance, how can we produce orifices smaller than those already produced with more refined precision technology so that we can observe their dynamic characteristics? To realize this, all the technical details of the system have to be taken into consideration. The system not only consists of the objects to be processed and the processing devices, but also consists of the working environment, mechanical and environmental control, training of the operating personnel, specifics of operation, and the fundamental understanding of the entire process. All those procedures must be properly handled in order to ensure the successful production of the smallest orifices possible, with perfect accuracy under the help of the most sophisticated precision instruments. I look forward to finding answers to this and many other problems during my graduate study at ASU.

In my future program at your prestigious graduate school, I intend to concentrate on the following areas of study: (1) MEMS; (2) CAD/CAM/CIMS; (3) Micro-Mechanical System; (4) Micro-Flow; and (5) System Control. In accordance with this, I would like to divide my studies into three distinctive stages. First, I will continue with my studies of the foundational courses in MEMS to construct a firmer theoretical basis to expand the related knowledge in electro-mechanical integration. In the second stage, I plan to undertake some research projects that can demonstrate leading technology and creativity, especially in the field of MEMS technology and its application, so that I may develop myself into a specialist in this field. Finally, since the 21st Century is bound to be a century of nanotechnology and since China's accession into WTO has created many technical challenges and opportunities, I believe that nanotechnology, especially MEMS, will become the prevalent technology in the new millennium. This will be a rare opportunity for the maturation and the development of nanotechnology and its products. By that time I can contribute my professional expertise to this important process as a leading scientist in China.

**Recommendation Letter**

**Dear Colleagues:**

I am the dean of School of Science, Northern Jiaotong University and a member of ASPE (American Society for Precision Engineering). As Mr. Manuel Yin's teacher, I am glad to write this letter to support his application for admission into your university.

In December 1999, Mr. Yin was assigned to do experiments on the dynamic characteristics of micro-jet in our school. I was attracted by his diligence and seriousness at the first sight of him. For three months, he stayed in the lab almost day and night and participated in every test. His logic reasoning and talents for experiments impressed all of us.

Before the experiment was carried out, he designed several plans. After comparing them, he chose the best one. In the regular reports, he summarized the precedent work, analyzed the problems they were facing and raised his solutions. His work helped to improve performance of the micro-jet .

Mr. Yin's talent in language and ability of solving problems are worth mentioning, too. Since our equipment was imported from other countries, most of the operation instructions hadn't been translated into Chinese by that time. Mr. Yin translated these English materials in his spare time. Because of his familiarity with the materials and his solid foundation of engineering, he solved a lot of problems in the operation of the equipment. For his excellent performance, he was praised by the teachers.

Mr. Yin is an active young man. He was enthusiastic about mechanical designing competitions, extra-curriculum activities and lectures on the latest development in the mechanical engineering field. All these helped him to advance in his study.

Having been to UNCC(University of North Carolina at Charlotte) as a visiting scholar, I know that compared with the development of precision mechanics technology in the US, we still have a long way to go. I take great pleasure in supporting this promising young man to study in your university. His sound foundation, serious scientific attitude and practicality give me confidence that he will finish his study successfully. I will be very grateful if you can give due consideration to his application for admission into your university and grant him financial assistance.  
  
Sincerely yours,