**Applied Program: Electrical Engineering**

As I complete my undergraduate program, I have come to a critical point in my life when I have to make an important decision concerning my future course of action. In this decision-making process, I firmly stick to the principle that in this world I must try to prove the value of my existence by achieving professional excellence. In different stages of my life over the past, I have been searching for my position among my peers by means of outstanding coursework and the development of excellent personal capabilities. My intended Master’s program represents a more important phase of my life and the field which I choose to specialize in will be one in which I will pursue a lifelong career. Therefore, I must choose to specialize in a field which I am most interested in, a field which has the greatest potential for future development and in which I can become a specialist. Microwave and Radio Frequency is the subject that I will focus on in my prospective Master’s program and I believe that Michigan State University is the university whose program in Microwave and Radio Frequency can develop me into a leading specialist in this area. In this technology-dominated age, I am sure that as long as I can make some important achievements in my chosen technological field, I can contribute to social progress by achieving technological advances.

At present I am a senior student majoring in Electronic Information Engineering in the Department of Electronic Engineering of Beijing University of Aeronautics and Astronautics. My undergraduate education offers a curriculum that has covered all the major fields in Microwave and Radio Frequency: circuit analysis, analog circuit (linear) and analog circuit (non-linear), digital circuits, electromagnetic field theory, microwave technology, signal and system, digital signal processing, principles of microcomputer, EDA, etc. It is fortunate that through my extensive studies of such a diversity of fundamental courses, I have been able to ferret out my concentrations—Electromagnetic Field Theory and Microwave Technology. In this process, I self-studied RF Circuit Design—Theory and Application by Reinhold Ludwig and Pavel Bretchko, Micro-Band Circuit by Tsinghua University Press, and RF Circuit Design by Joseph J. carr. Those books made me increasingly aware of the close relationship between the knowledge of microwave and analog circuit. In addition, they helped me establish a systematic and comprehensive knowledge framework.

From then on, I have been following closely the developments in Radio Frequency and Microwave by frequently reading technical journals and magazines such as IEEE-MTT and IEEE-AP. Currently, I am applying for student membership of IEEE. Wireless communication is a most rapidly developing field. This is especially true of the research on radio frequency. For instance, the technology and the techniques of designing amplifier, wave filter, vibrator, and heterodyne modulator have been improving at a surprising speed. I feel excited for being interested in a field that has such a bright prospect and in which I will be able to accomplish some important achievements.

During my undergraduate studies, I have already made some tentative efforts to do research in the field of microwave and radio frequency. An experience during my junior studies aroused my research interest. That year, I attended a radio frequency and electromagnetic field simulation software exhibition. I was deeply impressed by the convenience of operation and the powerfulness of the functions of the radio frequency simulation software. This exposed me to radio frequency circuit CAD. In the following one year, I studied and applied some radio frequency and system simulation software, including Serenade and Microwave office. In addition, I developed some understanding of the two-dimensional electromagnetic field simulation software—EMSEMBLE—and three-dimensional electromagnetic field simulation software—HFSS—concerning their fundamental functions and their design procedures.

Under the guidance of my advisor, I applied the specialized knowledge I learned in microwave integrated circuit materials, microwave mixing integrated circuit and microwave single-chip integrated circuit and designed, by means of Serenade software, the standard low-passage wave filter, microwave low-noise amplifier, feedback vibrator and single-terminal heterodyne modulator. I conducted simulation testing of those designed products and they all showed satisfactory results. What made me especially proud of myself is the fact that, by relying on my solid foundation in my specialty and my skillful programming abilities, I completed a simple but precise visualized Smith Polar impedance matching compiled with the help of Visual Basic programming language. Although this simple software seemed somehow immature when compared with the products developed by those large-scale microwave simulation software companies in terms of algorithm, function, application and interface, it has special implications for me in that it testifies to my creativity, my foundational skills, and my courage and ability to overcome difficulties in research. Above all, it brought me immense joy of creation.

While helping me build up my specialized knowledge, my studies heretofore have also triggered my serious reflections on some important issues. For instance, in this era of speedy technological development, the work frequency of both analog circuits and digital circuits is becoming increasingly improved. With the frequency enhancement and the fact that the wavelength of its corresponding electromagnetic wave becomes comparable to the size of the isolated circuit components, the electro-response of those resistance, capacitance and inductance components will start to deviate from their expected frequency properties. In order to understand and to solve those problems, it is necessary for us to know the differences between the high-frequency properties of high-frequency circuits and those of the low-frequency circuits and how they can realized.

The most direct reason why I apply for the Master’s program of Michigan State University is that I can do some in-depth studies and research in a much better academic and research environment so that I can lay a solid foundation for my future research and career development. The Michigan State University is reputed for its strong faculty and its unparalleled professional level. In particular, the possibility that I might join the Electromagnetics Research Group to undertake both thorough theoretical studies and extensive research practices becomes the most essential reason for me to choose your esteemed university as my first priority. In my future studies, I intend to concentrate in microwave and radio frequency. I would like to make the design of radio frequency and microwave circuit as the specific area to focus on in my specialty. This is because I am also very interested in IC design and have some knowledge and understanding of EDA. In addition, well-trained people with talents in IC design are sorely demanded in China where I see the best opportunity for my career development. With the continued escalation of work frequency of the future electronic circuits, the field of high-frequency circuit design will undoubtedly become the focus of concern of the future industrial community. Finally, my study and research interest also includes possible involvement in MMIC research.

All achievements are obtained through great efforts. My future is no exception. My intelligence, my capacity for sound logical analysis, strong psychological and physiological conditions, the readiness to venture into new fields and the courage to face new challenges will serve as important guarantee for achieving success in my future. I am fully confident in myself in being able to acquit myself satisfactorily in my future program. I am sure that with the knowledge and the expertise I acquire from your program, I will have unique advantages to excel in my chosen field.