**Analytical Report of Graduate School Program**

I. Programs Overview

**Program 1: Master of Science in Information (MSI), University of Michigan (UM)**

* **Areas of Interest:**

MSI is provided by School of Information in University of Michigan. It is an interdisciplinary degree. It supports a wide range of information related careers and specializes in three areas, which are data science and analytics, digital archives and library science and human computer interaction and user experience [1].

* **Program Requirements and Curriculum:**

The MSI is a 48-credit degree program, with a minimum of 39 credits required from School of Information courses. While the program will take you two years to complete on a full-time basis, you may also elect to take it over three to four years part-time. Moreover, at least 21 credits should be taken within UMSI while up to 9 credits could be taken in other U-M departments [2].

* **Career Development Resources**

There is a team of career development experts in School of Information called “UMSI Career Development Office”. They provide students with strategic, customized, and comprehensive career services. This office also offers career courses, workshops, interview preparation activities, on-campus recruiting program and career fair.

According to the 2021 MSI Employment Report, the overall average salary is $87,000 and overall median salary is $82,500. The average job search length is 3-4 months. We can see high salaries and a 92% job satisfaction rate [3].

**Program 2: Master of Science in Financial Engineering (MFE), University of South California (USC).**

* **Areas of Interest:**

MFE is a multidisciplinary education program, which is provided by Viterbi School of Engineering, the Marshall School of Business and College of Letters, Arts and Sciences [4]. The purpose of this project is to train students with application of mathematical and engineering tools to finance. Engineers will learn tools of finance and economics, engineering, applied mathematics, and statistics. They will gain knowledge of derivative securities valuation, strategic planning and dynamic investment strategies, risk management, etc.

* **Program Requirements and Curriculum [5]:**
* A minimum of 30 units.
* Required courses: 18 units.
* Two electives in the areas of finance, business, and economics: 6-8 units.
* Two electives in the areas of optimization, simulations, and stochastic systems: 6-8 units.
* **Career Development Resources**

USC has a website called “connectSC”, which is a platform for both students and employers. This platform is run by the USC Career Center. Employers can post jobs and internships on this platform. Students are able to find jobs, workshops, and Career Center services. Also, Viterbi Career Gateway is a career development resources for the students in Viterbi School of Engineering specifically. However, there are so many subjects in Viterbi, including Computer Engineering, Data Science, Mechanical Engineering, etc. There is not a particular career development office for MFE students.

II. Analysis and Comparisons

The two programs I’m interested are not in the same disciplines. The MSI in the UM is about data analysis while the MFE in USC studies financial engineering. These two choices are relevant to the job I’m going to take in the future. I’m intended to become a quantitative analyst in PE or VC. Those companies require people with solid computing skills and ability of data analysis. Therefore, the pre-request of entering those companies is to have a master’s degree in either data science or financial engineering.

Comparing with the curriculum provided in the two programs, I find the MFE in USC is more attracting, since the courses are offered by three powerful and famous academies. Therefore, I can get more knowledges from various disciplines including math, statistics, computer, and finance. However, this can be a disadvantage comparing to the MSI in UM, since the program in UM focus entirely on data science.

When it comes to the career development services, the UM certainly provides a more powerful assistant to the students. It has much clear picture of how they are going to instruct the students in their career choosing and development. However, there are more job opportunities in the USC rather than in the UM. Since the USC is in California, most students can work in Internet giants like Google, Apple, Amazon, etc.

In general, those two programs have their own advantages and disadvantages. I prefer a little bit more to the MFE in the USC by putting the living condition, tuition, and many factors into consideration.

III. Purpose Statement

The first time I had this idea was in 2012 when I was 12 years old. My uncle lost nearly 70% of his assets because of an investment failure. This scene gave me a huge shock, and I also began to have a strong interest in investment. After growing up, I have a deeper understanding of the stock market, risk, and investment. I know that investment not only teaches individuals how to make money but more importantly, to optimize the distribution of social resources and improves the production efficiency of the whole society. I hope to enter the world's top universities like USC to study financial engineering, so as to have a more specific and profound understanding of investment strategies and risk management.

In addition to the financial field, I also have a very strong interest in computers. When I was in high school, I became fascinated by programming, and I studied electronics and computer science at one of the top 3 universities in China. During my undergraduates, I explore a strong interest in mathematics and algorithms. I studied mathematical analysis, linear algebra, partial differential equations, and discrete mathematics, and achieved good results. After learning discrete mathematics, I became obsessed with algorithms. I once wrote an Othello AI, which got the eighth position in the school competition. However, I am not satisfied with studying pure programming. In contrast, I prefer interdisciplinary fields. In some projects, I can apply my mathematics and programming skills to various other interesting fields. Therefore, I participated in the ICM (The Interdisciplinary Contest in Modeling) in January 2020. I used graph theory and planning methods to establish a dynamic model, which is used to analyze all football games’ data in a season. Finally, we gave a comprehensive score for different teams and provide the coaches specific ways to improve their team performance. We won the M award (Meritorious Winner, 7%) in this competition, which greatly encouraged my interest in interdisciplinary modeling. In financial engineering, we often need to apply mathematical models and programming knowledge to the financial field to make investment strategic planning. I think my solid coding skills, mathematical modeling skills, and cross-disciplinary competition experience have laid a good foundation for my future study of financial engineering. I believe that the Master of Financial Engineering at the University of Southern California can bring me more in-depth courses and deepen my understanding of mathematics and programming in the financial field.

My scientific research experience also prepares me to adapt to the life of a graduate student. I used to work as a research assistant in the Smart Display Lab of Shanghai Jiao Tong University. My major discipline is computer vision and SLAM technology. During the one-year scientific research, I deeply dug into the principles of SLAM technology and carried out the application on the mobile phone. My paper is adopted by International Conference on Display Technology. This research experience allowed me to apply the theoretical knowledge I learned such as graphics and Lie algebra to a specific project. It requires deep research and understanding of the principles and implementation methods of technology. Also, the views on the problem are deeper than those at the theoretical level during the undergraduate study. Therefore, my research experience can make me better adapt to the graduate study style.

Beyond my core studies, my internship has also been key for building my skills and furthering my understanding. I am doing an internship at the China Industrial Securities Research Institute of Economics and Finance. My position is a sell-side securities analyst assistant. My main tasks are to analyze the stock market, industry, and accounting to predict the future stock price of listed companies to provide advice to fund companies. I learned how to makes judgments about the company's past and current development, and also makes predictions about the company's future business strategy and development status through studying the macroeconomics and industry environment. Through financial analysis, I learned how to discover the factors that affect the realization of the company’s business objectives, as well as the effects of changes in various factors on the realization of the business objectives. By analyzing the company’s financial information, I’m able to study the future trend of the company’s stock price. Through investment analysis. I study the stock market, combine macroeconomic analysis, and company financial analysis, to estimate the price of stocks, and make recommendations for stock trading.

I am very interested in the courses offered by the financial engineering major of USC. There are courses on algorithms, trading, investment, and finance. The high-quality academic atmosphere and excellent teaching resources allow me to give full play to my strengths and devote myself to the fields I truly love. I hope to study at the University of Southern California, where I can make full use of high-quality teaching resources and make greater contributions in the future.

References

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