Study Plan

Applicant: Sonia Akter Mona

Introduction

My journey into Computer Science began with an inherent curiosity about how technology shapes our lives and industries. During my undergraduate studies at Green University of Bangladesh, I explored diverse domains of Computer Science, with a focus on software testing and quality assurance. At the same time, I examined algorithmic optimization and software engineering. The wholesome experience from research, projects and internships has helped shape my ambition to pursue advanced studies in Computer Science and Engineering (CSE) to contribute to the technological advancements of tomorrow.

Academic Background

I successfully completed my Bachelor of Science in Computer Science and Engineering from Green University of Bangladesh, graduating with a CGPA of 3.44 out of 4.00. Throughout my academic journey, I dedicated myself to understanding the foundational principles of computer science, consistently performing well across a variety of courses. My studies allowed me to develop a reasonable interest in software engineering, cyber security, software testing, and networking fields where I focused much of my learning and practical application. This academic experience not only equipped me with technical knowledge but also fostered critical thinking and problem-solving skills essential for tackling real-world challenges.

Research Background

My Bachelor's thesis, *"Design and Implementation of a T-way Test Case Generation (Sequence-based) Strategy using Meta-heuristic Search"*, provided me with an opportunity to explore software testing at a deeper level. This research focused on the development of test cases using genetic algorithms to optimize testing processes, significantly improving test coverage and efficiency in complex systems. The project was instrumental in equipping me with the following skills:

- **Algorithm Design:** Implementing meta-heuristic techniques, including Genetic Algorithms and optimization methods such as the Fish Swarm and Cuckoo Search Algorithms.
- **Software Testing Expertise:** Understanding the complexities of generating test cases for sequence-based input interactions in NP-hard problems.

Research Interests

Building upon my academic and research experiences, my research interests lie in the intersection of software engineering, IoT, optimization techniques, and algorithm design. Specifically, I am intrigued by:

- **Software Testing and Quality Assurance:** Enhancing automated testing methods and optimization techniques to improve software reliability and efficiency.
- **Internet of Things (IoT):** Exploring innovative solutions to ensure secure, scalable, and efficient IoT systems.
- **Algorithmic Optimization:** Investigating meta-heuristic algorithms for solving complex optimization problems, particularly in software engineering and system design.
- **Cybersecurity and Network Reliability:** Developing robust mechanisms to safeguard systems and networks against vulnerabilities and ensure their reliability.

Through my future research, I aim to contribute to innovative advancements that solve critical challenges in software systems, ensuring their reliability, security, and scalability in an ever-evolving technological landscape.

Professional Experience

Starting my professional life as an SQA engineer, I focus on making software more **user-friendly**, **error-free**, product quality and reduce risks. Software testing experience has helped me develop critical and distinct skills. It has taught me to think analytically and pay close attention to every detail. Some examples of my contributions include:

1. **E-Commerce Platform(Web, Android and IOS App) Testing: (**Qcoom.com, Partners.com.bd) Identified and resolved critical checkout bugs, improved API integration and app performance, ensured secure payments, and enhanced product quality through comprehensive testing.
2. **Auction Platform Testing:** (No Syndicate.com) Ensuring seamless bidding, user registration, and payment processes. Resolved real-time bidding and latency issues, secured payment gateways, enhanced user experience.

Reason to Study in China

China's rapid advancement in technology and its commitment to fostering innovation, make its excellent research and education system an ideal destination for my Master's studies. The country is home to world-class universities, state-of-the-art research facilities, and a vibrant ecosystem for technological development. The country has invested heavily in sectors like artificial intelligence (AI), 5G technology, quantum computing, e-commerce, fintech. At the same time offering a range of facilities to attract international talent and the government actively promotes international education.

China's growing influence in global trade, technology, and geopolitics offers foreign students excellent opportunities to build international connections. At the same time, Chinese culture is known for its hospitality and friendliness, making it easy for students to adapt and feel welcome. China values a balanced lifestyle that blends hard work with respect for family, community, and nature, providing students with a harmonious environment for academic pursuits, cultural exploration, and relaxation. Overall, China offers an ideal setting for students seeking both personal growth and academic success.

Why Donghua University?

I chose Donghua for my Master's in Computer Science and Technology because it is well-known for its high academic standards and focus on innovation. The university has experienced professors who can guide me in my studies and career. Donghua has modern research facilities, like the National-Local Joint Engineering Laboratory which will help support my research in software engineering.

Donghua offers great chances to work with industry leaders and gain real-world experience. The university also has strong international connections that will help broaden my knowledge. With all these factors, Donghua is the perfect choice for my academic and career goals in software engineering.

Career Goals

My career goal is to build a strong foundation in **software engineering**, **software testing**, and **cybersecurity**, while pursuing **research** and a **PhD**. Initially, I plan to gain practical experience in software development and quality assurance, focusing on software security. In the long term, I aim to contribute to research in **cybersecurity** and **optimization algorithms** through a PhD, work on cutting-edge projects, and eventually become a professor to mentor future engineers. Additionally, I aspire to start my own tech company, developing innovative solutions in software security and quality.

Personal Qualities and Extracurricular Activities

I am a disciplined, motivated, and adaptable individual. My involvement in national and international software testing projects has honed my technical and collaborative skills. Additionally, my participation in voluntary organizations and leadership roles has strengthened my communication and problem-solving abilities, making me well-prepared for the challenges of graduate studies.

Conclusion

The Master's program in Computer Science and Technology at Donghua University presents the ideal opportunity to enhance my technical expertise, engage in impactful research, and contribute to the field of software engineering and cybersecurity. With my strong academic background, hands-on experience, and passion for technological innovation, I am confident in my ability to excel in this program. The university's emphasis on cutting-edge research, coupled

with its vibrant academic and cultural environment, aligns perfectly with my aspirations. I am eager to join Donghua University and make meaningful contributions while advancing toward my long-term goals. Thank you for considering my application.

Yours sincerely,

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