Statement of Purpose

From a young age, I have been fascinated by complex systems, particularly the human brain. As a child, I would watch clouds and predict weather patterns, sparking my interest in how the brain processes information and makes predictions. My curiosity about system dynamics deepened when my brother explained how neurons store and predict data. This early fascination has evolved into my desire to create systems that function with similar efficiency and complexity. This interest naturally led me to explore computing, particularly the realms of system engineering and machine learning.

After completing my BSc in Computer Science and Engineering from Daffodil International University (DIU), where I ranked third in my section with a GPA of 3.74, I was invited to join DIU's research team as a Machine Learning Engineer. During my tenure, I led several impactful projects, including developing a dropout prediction tool, a Covid-19 detection system from chest X-rays, and a digital attendance system using facial recognition. These experiences, along with my designation as "Employee of the Year" in 2020, fueled my passion for designing systems that address real-world problems.

Currently, I am pursuing a Master's degree in AI Convergence Engineering at Gyeongsang National University, where my research focuses on optimizing Solid-State Drives (SSDs) through machine learning. This focus has led me to develop a web-based SSD simulator called Eyana: The SSD Simulator, which explores the intricate workings of SSDs. My work was presented at the prestigious 31st Korean Conference in Semiconductor, highlighting the potential of machine learning in enhancing SSD performance.

As I delve deeper into the field of SSDs, I have become increasingly interested in the intersection of hardware and software, particularly how operating systems manage resources in storage devices. My work aims to optimize SSD communication and parallel processing, inspired by the human brain's ability to process vast amounts of information in parallel. Through Eyana, I am exploring ways to improve SSD efficiency by aligning system-level software with the hardware's potential.

In parallel with my SSD research, I have also explored the potential of quantum computing. My interest was piqued after completing the course "Quantum Computing for Everyone 1" from UChicagoX, which inspired me to build a quantum computer simulator. This project, though still evolving, aligns with my long-term goal of integrating quantum computing principles with SSD technology and system engineering.

Throughout my journey, my overarching goal has been to contribute to system engineering, with a particular focus on enhancing the performance of critical system components like SSDs. I believe that

combining machine learning, quantum computing, and system engineering can revolutionize how we design and optimize computing systems.

With this vision in mind, I am eager to continue my research at an advanced level. Upon completing my Master's degree, I intend to pursue a Ph.D. that further explores the intersection of operating systems, storage technology, and advanced computing paradigms. I am confident that my academic background, coupled with my hands-on research experience, has prepared me for this next step. Ultimately, my ambition is to contribute to the advancement of system engineering, with a focus on innovating future storage solutions and computing architectures.

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