**Personal Statement for PhD Application**

I am excited to express my strong interest in pursuing a Ph.D. in Biomedical Engineering under the guidance of Dr. Liu Chang at UMass Amherst. Dr. Chang’s research on the application of nanotechnology in developing biosensors perfectly aligns with my interdisciplinary interests in biomedical engineering, physics, and electronic design.

My dedication to biomedical research has developed over seven years of focused effort. Growing up in a family of engineers, I was naturally drawn to physics and its real-world applications. I began my academic journey as a physics major, but my early research on data analysis of materials' cracking behavior under high pressure revealed a critical gap. I discovered that the primary challenge was not the physical theories but the algorithm implementations and optimizations required for effective analysis, which led me to switch my major to electronics while continuing to study physics and statistics out of personal interest.

After completing my undergraduate studies, I sought to apply my background in physics and electronics to a meaningful research area. During my final semester, I had the opportunity to design a website for AxisMed, a biomedical engineering group developing an online urine test system. This experience illuminated how my skills could significantly contribute to biomedical engineering, prompting me to pursue a more specialized path.

To build on this foundation, I pursued a master’s degree at Boston University, where I collaborated with Dr. Yang on developing a 3D hydrophone scanning system for a biomedical lab. This project involved controlling step-motors, designing 3D-printed components, and utilizing photoacoustic techniques—all of which are critical in biomedical research. This experience reinforced my confidence in designing medical devices with real-world applications and solidified my decision to pursue a Ph.D. in biomedical engineering.

My interdisciplinary interests also extend to mathematics and statistics, which I have studied extensively to develop virtual models and optimize system performance. I have explored machine learning and mathematical modeling, understanding that these are two key approaches to behavior modeling: pattern recognition from data and physical property-based system modeling. For example, I participated in a math contest with two other students, earning an Honorable Mention, which further honed my quantitative skills.

These skills will be essential when working with Dr. Liu, whose research on microfluidic design could benefit from predictive modeling of fluid behavior under various conditions. I am particularly interested in the potential applications of digital microfluidics in developing point-of-care diagnostic devices.

If accepted into Dr. Liu’s project, my short-term goal is to develop a prototype of a point-of-care test device for HIV detection. I am also eager to explore further research in digital microfluidics during my Ph.D. studies. My long-term goal is to contribute to advancements in medical research by working in a cutting-edge biomedical research lab or company. I am highly motivated to develop innovative systems that have practical biomedical applications.

Thank you for considering my application. I hope my enthusiasm and dedication to advancing biomedical engineering are evident and that I will have the opportunity to contribute to your program