



Graduate School Statement of Purpose Example for Mechanical Engineering (859 words)

My road to mechanical engineering began with my dad unceremoniously kicking me out of the kitchen. By the time I was in kindergarten, I couldn't resist rummaging through my family's cupboards, trying to find something to take apart and rebuild it. This became a running joke in my family that, rather than knives or other sharp objects, I had to be kept away from screwdrivers, lest I end up taking the whole house apart. This all changed when I discovered desktop computers, and specifically GPUs, which I found endlessly fascinating in their ability to be easily disassembled and modified.

Although my free time during high school was indeed spend huddled over computer hardware much the way my childhood was, I became interested in the capabilities of redirecting the work capacity of hardware, and in particular the ability to reorganize the way hardware acceleration can be optimized to assist in Computer-Aided Engineering (CAE) tasks in manufacturing. During my undergraduate work at X University, I developed an interest in machine learning while working on Dr. Cheboygan's ongoing research in augmenting GPU software to better optimize their performance in general-purpose computations. In both my senior thesis and independent study blocks, Dr. and I studied a number of potential workarounds for latency bottlenecks relating to DDR5 infrastructure.

This phase of my research cemented my desire to continue on with both machine learning and CAE, and it's precisely around these points that I'd like to develop my MSc thesis. Specifically, I want to build on the considerable research on GPU acceleration I undertook during my BS in order to further expand upon shifts in both manufacturing and product design. As abstract as this work has been in many ways, its end result would be to streamline workflows for product engineers that will greatly speed up the process of dealing with intractable problems relating to bottlenecking by physics computations.

I'm motivated to address sophisticated problems like this for a fairly non-academic reason. Throughout the last two years, I've participated in organization drives with X organization, my region's largest manufacturing union. Admittedly, I came to this work with quite personal motivations, having seen my mother's engineering positions often under attack by naïve or even ignorant efforts to automate various aspects of product design. My work with this union sought to argue, from a scientific perspective, the need to improve both software and hardware using human-supervised machine learning and not wholesale robotic automation. Rather than downsizing and eliminating human positions in the manufacturing process, I offered data to union leadership that showed how a minimal investment in technological upgrades at the level of product implementation could preserve job security for product engineers and implementation supervisors while vastly speeding up the manufacturing process to deliver an increased output of nearly 80% in some cases.

This was immeasurably satisfying, and although not every negotiation was a success, I was able to contribute something unique to a class of workers who I felt had suffered under an outmoded and overly aggressive model of automation for nearly 20 years. In short, I would



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like to pursue graduate work in mechanical engineering at Z University because I think my work can have an overwhelmingly positive impact in aspects of labor tensions relating to instrumentation and automation. I think that through careful work in machine learning and deep learning, we can target specific aspects of the manufacturing process that have proven to be flashpoints of conflict between engineers and administrators.

The department's emphasis on teaching throughout the graduate program is also a huge draw for me. I tutored privately throughout my undergraduate years, and volunteered at my school's learning center to help students not only with introductory engineering courses but also calculus and linear algebra. Reconnecting to this passion for high-level mathematics, I would seek to work with Dr. Muskegon and Dr. Flint to both participate in and utilize their research in computational methods to clarify the mathematical dimension of my proposed thesis. Dr. Muskegon's recent publications in the International Journal of Computer Theory and Engineering are especially relevant to this work, as I believe my course of study would benefit greatly by implementing her utilization of novel approaches to principal component analysis.

Lastly, on a simpler note, I've always been drawn to the West Coast, and would love to explore the wilder, mountainous areas North of Vancouver during my free time. Growing up in the flatlands of the Midwest seeded a very strong desire for the "big landscape" areas of Western Canada, and I can think of no better compliment to the abstract and small-scale work I'd be undertaking in the mechanical engineering program than to spend my free weekends hiking and camping in places like Coquitlam mountain. Which is to say, simply, that I believe UBC is an ideal location for my next phase of scholarship not only because of its academic innovation and integrity, but because its surrounding environment is both beautiful and inspirational. I would arrive and continue to be an enthusiastic and incredibly engaged student in UBC's MSc program, and I would be honored to assist in the incredible work being undertaken by both faculty and fellow graduate students alike.