

My mother, a clerk at an electronics store, opened a book and studied Chinese literature as her hobby at night when she returned home from her hard labor. I grew up influenced by her academic passion from an early age. I liked to endlessly contemplate solving challenging math problems, even when taking a shower or just before I fell asleep. I learned from her that academic improvement originated from love and dedication to studying. I made academic progress based on this dedication, even though my main field of study changed. Although I was highly immersed in semiconductor physics as an undergraduate, I wasn't interested in researching invisible things. Instead, I dreamed of designing power converters and driving electric machines. So, I broke into a new field, power electronics, as an M.S. student. My love for power electronics has grown since I spent all night revising my PFC hardware and devising sensorless control algorithms. It wasn't painful, nor was it any sacrifice because I love researching and always tried to come up with novel ideas from them; hardware, software, control, topologies, etc. Absorbed in power electronics, I naturally hoped to become a lifelong researcher. I keep researching on weekends, even dreaming of equipping an ironing machine and scope in my house.

$f'(t) > 0$ is my 'life inequation', which expresses my faith that I keep growing better every day than yesterday in every aspect. I don't always wish for success because failure instead gives me more lessons. Like control theory, negative feedback from failure generates the energy needed to reach goals. I love powerlifting, which has been my hobby since I've often failed to lift the heaviest weight but succeeded after many hours of working out. Likewise, my academic performance improved because I've always found my weakness even from successful results, and I set new goals right after reaching my previous goals. I kept looking for more challenging problems. For example, I solved the practice problems not only in the main textbook of the lecture but also in MIT's problem sets, which have more challenging problems for studying quantum physics and semiconductors. Thanks to that, I was able to have a deeper understanding of their formulas and physical meanings. As a result, I improved my GPA significantly after my sophomore year to an excellent level. In my M.S. course, I didn't depend on senior students' legacies. I constructed simulation models only referring to the journal papers and tried many algorithms in experiments from scratch. After a long effort, I've gotten outstanding paper results (ECCE and TPEL's 1st author) and practical skills despite the abrupt transition to the study area. I believe academic challenges are not barriers but new opportunities to develop myself. I am willing to confront diverse academic challenges in my Ph.D. journey and make significant progress as a skilled engineer. I still thirst for new knowledge and hope to improve my weakness endlessly.