

My mad-scientist-engineer of a father always had a crazy project to share with me when I was young; as soldering at age five evolved to building leaf blower hovercrafts at ten, I uncovered my love of robotics before starting high school. Then, without warning, my dad died of a sudden heart attack when I was fifteen. I was devastated; not only had I lost my father, but I thought that I lost my crazy projects and future robotics endeavors. Then, Dad's friends banded together, investing hundreds of hours of their time teaching me circuit design and introductory control theory, which solidified my love of robotics. I wanted to pay dividends on my mentors' investment, but all actions and gifts seemed insignificant. After reflecting, I realized I could use my robotic pursuits to pay forward my mentor's kindness. I intend to apply my engineering education to enhance the lives of the differently abled, and improve the safety of both our soldiers abroad and citizens at home alike by retrofitting methods founded robotics autonomy on everyday machines. I intend to develop measures and applications of human cogency and ability so that our robotic partners – an intelligent wheelchair, a fighter jet, or a sedan – can adapt to a human's present ability, identify a possibly dangerous command, and autonomously mitigate undesired or harmful outcomes. In the short term, I seek a deeper understanding of the technical obstacles facing the fields of shared control and autonomy allocation. By joining the argallab of Northwestern University located within the Shirley Ryan AbilityLab, the nation's primer rehabilitation hospital, I have positioned myself to apply my research to rehabilitation and assistive robotics. This domain is particularly salient for applications of robotics autonomy because human input must be reliable for continued freedom-of-mobility. My research in assistive robotics will immediately enhance the lives of those unable to fully control their assistive devices as a result of warfare, inherited disease, or life-altering accident. Following my graduate studies, I intend to found a company focused on bringing these cutting-edge technologies into the hands of disabled persons, warfighters, and consumers alike. Inspired by my desire to give back, I oversaw six outreach events impacting at least 100 under-served K-12 students at the county- or state-levels during my college career. These experiences inspired my desire to become a national policy maker in my late career so that I may use my background to advocate for, among other things, equal access to STEM education across America. Better access to education improves both America's national security and economy while simultaneously enhancing the lives of her citizens. Presently, I continue my STEM outreach activities with the hopes of providing equitable STEM education access to local students and inspiring the next generation of American scientists and engineers. The NDSEG Fellowship will not only afford me the intellectual freedom to pursue my research, but also a connection with the defense community that will ensure my research improves the lives of our soldiers, veterans, and citizens alike.