

Personal Statements Essay

NSF Fellows are expected to become knowledge experts and leaders who can contribute significantly to research, education, and innovations in science and engineering. The purpose of this essay is to demonstrate your potential to satisfy this requirement. Your ideas and examples do not have to be confined necessarily to the discipline that you have chosen to pursue.

Describe any personal, professional, or educational experiences or situations that have prepared you or contributed to your desire to pursue advanced study in science, technology, engineering, or mathematics. Describe your competencies and evidence of leadership potential. Discuss your career aspirations and how the NSF fellowship will enable you to achieve your goals. Provide specific details in the narrative that address the NSF Merit Review Criteria of Intellectual Merit and Broader Impacts as described in the program announcement.

Intellectual Merit

The intellectual merit criterion includes demonstrated intellectual ability and other accepted requisites for scholarly scientific study, such as the ability (1) to plan and conduct research; (2) to work as a member of a team as well as independently; and (3) to interpret and communicate research findings. Panelists will consider: the strength of the academic record, the proposed plan of research, the description of previous research experience, references, Graduate Record Examinations (GRE) General and Subject Tests scores, and the appropriateness of the choice of institution relative to the proposed plan for graduate education and research.

Broader Impacts

The broader impacts criterion includes contributions that (1) effectively integrate research and education at all levels, infuse learning with the excitement of discovery, and assure that the findings and methods of research are communicated in a broad context and to a large audience; (2) encourage diversity, broaden opportunities, and enable the participation of all citizens—women and men, underrepresented minorities, and persons with disabilities—in science and research; (3) enhance scientific and technical understanding; and (4) benefit society. Applicants may provide characteristics of their background, including personal, professional, and educational experiences, to indicate their potential to fulfill the broader impacts criterion.

A few years ago, I received an email from a name I didn't recognize. It came from a high school student named Kapambwe. Kapy, as he liked to be called, had seen my website and had been fascinated by some of the projects I was working on. He said he had doubts about succeeding when he first moved to the US from Zambia, but seeing another immigrant doing so well had changed his entire outlook. He wanted to meet me in person. I was stunned.

I met with Kapy a few weeks after the initial email. At the time, he wasn't sure he could afford a college degree or if he really needed to go. He had the same passions I felt when I was younger, and it became clear he had the potential and drive to do well at any institution. We discussed a few of his options, and I pointed him towards some financial programs that could help. Kapy left the meeting with a smile on his face, and for the first time, I experienced the true reward of guiding someone's ambitions in life.

I felt a deep kinship with Kapy from my childhood in Ghana. Growing up, I often refused to go outside and play, ignoring my mother's requests with a simple phrase in our native tongue: "Gyae me haw, me ye m'agyuma." Roughly translated, it means "Leave me alone, I am working." Venturing outside seemed a waste of my time when I could be "improving" everything I could get my hands on. Although I broke more things than I improved, I learned at an early age the impact intellectual exploration made.

My family left Ghana soon after that, traveling the world for a few years before settling in Indianapolis. I am lucky to have experienced a range of peoples and cultures. I witnessed the clear inequities in the way people lived and learned, and I felt compelled to help. I dedicated myself to learning all that I could, focusing my efforts on the fields that most captured my curiosity.

In college, I struggled to pursue all my interests. It was only when I started the Engineering Dual Degree program (EDDP) that I found a suitable compromise. With this five-year program, I was able to integrate engineering from Purdue University with liberal arts from Butler University. I pursued simultaneous bachelor's degrees in electrical engineering and computer science with minors in business administration and math.

It was during my time in the EDDP that I learned my ability to lead could be as powerful as my technical skills. I spent 4 of my 5 undergraduate years as engineering club president. In addition to being a role model for the program, I was responsible for speaking to incoming students, meeting with school administrators, overseeing a number of club projects, and helping shape the curriculum. In 2001, I was a founding member of Engineering Projects in Community Service (EPICS) at Butler. EPICS is a service learning program in which students work on a long-term team-based project with a nonprofit organization in the community. The team I led developed a web-based gaming and testing environment for the Spanish curriculum at a local middle school. That same year, I led another team to start an online newspaper, a project that changed the way student-driven news was delivered at Butler.

While tuning the "soft skills" needed to make my ideas work on real projects, I also made it a point to lead academically, demonstrating my passion through a commitment to my studies. I was fortunate enough to win top academic awards in both computer science and engineering each year and graduated as one of the top students at both Butler and Purdue.

Upon graduation, I worked full-time as an engineer at Raytheon Technical Services Company. I led a team of cross-functional engineers redesigning sensing tools for the US Navy. In my previous experience as an intern at Raytheon, I had been given the freedom to design and both software and hardware for the company. I had been trusted to find problems and create solutions.

Unfortunately, as a full-time employee, I felt the creative aspects of my personality underutilized. The freedom to experiment and explore I had as an intern was gone. Coming to grips with this reality and acting on it was the most difficult decision I have made. Looking at the activities I did in my free time helped simplified the process.

For the last few years, I ran my own computer-consulting firm, and found real purpose in the projects I worked on. From local musicians to multi-national corporations, each client came to me with a unique set of problems. It was my responsibility to discover more efficient ways for them to interface with their tools. Sometimes it was as simple as a web application. Other times, it was as complex as setting up a web-café operating via satellite link in war-torn Liberia.

That focus on the interface between hardware and software led me to a desire to build large-scale ubiquitous systems. I wish to build a framework for both the hardware and software used in developing these systems. My framework would simplify integration by forcing researchers to focus on what combinations of hardware and software can produce the best possible applications. I believe that only when these applications are developed can we begin the transition to this new way of ubiquitous computing.

While industry could produce such a framework, I feel a graduate program is a far better choice because it is an environment where the only product to be shipped is new knowledge. This important distinction means the emphasis is on exploring all options, collaborating across borders, and creating new ideas – things industry can't easily provide me. In order to keep doing what I have always loved doing, I had to come to graduate school.

I am now in the University of Washington's Computer Science and Engineering program pursuing my Ph.D. The decision to attend UW was influenced by their strong faculty and their ties with industry. With leading researchers like James Landay and Gaetano Borriello, UW offers an incredibly diverse and supportive environment where I can develop both the hardware and software components of my research. UW also offers me the chance to collaborate with Intel Labs, Seattle – a hotbed for ubiquitous computing research.

Now that I am in the midst of graduate education, I am realizing how important it is for computer science to attract students from more diverse backgrounds. The problems the field faces apply to the world as a whole and it is naive to assume that our narrow focus is adequate. Factor in dwindling interests in science as a career and the situation turns grim.

It is when I step into my classroom that I become hopeful. I am currently a teaching assistant, and I see that many of my students are a lot like Kapy. They may not look like him, but they face similar problems. They may have been told that girls don't do well in computer science. They may notice they are the only Native American in the room. They may feel that their love for sociology is not an asset or worry about the rising costs of education. I know that as long as I stay in the classroom, I can help them all find their place in computer science, the same way Kapy did.

Kapambwe is now a junior and is successfully studying computer science and mathematics at Harvey Mudd. His younger brother is also studying computer science and just added a software engineering major. Clearly, their success is their own doing, but I feel the small amount of time I spent with Kapy that day made an impact which he passed on to his brother.