

The statement of purpose is an essay crafted to convey your academic and career goals, *with an emphasis on your current research interests*. In this essay, you should demonstrate an understanding of questions and issues within your discipline and clearly explain your reason for pursuing doctoral level (PhD or MD-PhD) training.

A. The Leadership Alliance is committed to developing a diverse research community. Please describe the personal and/or professional significance this Leadership Alliance goal holds for you as an emerging scholar. How will you contribute to or benefit from The Leadership Alliance's goal of developing a diverse research workforce? (Suggested length - 250 - 500 words)

B. Consider the following questions in preparing your statement of purpose. These should help guide the writing of your research story. (Suggested length - 250 - 500 words)

- Why are you interested in research, what helped develop this interest, how have you pursued this interest thus far, and how do you hope to carry this interest into a PhD program and career?
- What are your current research interests? The clearer you state your research interests (whether they are specific or general), the easier it will be to identify potential faculty mentors.
- Describe how previous coursework or other experiences have influenced your interests. Would you prefer to continue on a similar path of inquiry, or to engage in a different approach, technique or field of study?
- What are your future educational and career goals, and how does training as a researcher fit with your goals?
- What academic, volunteer or work experiences have best prepared you to engage in research?
- If you have not previously conducted research, describe how your coursework or other opportunities have influenced your research interest and scholarly goals.

Human interaction is a mysterious, yet wonderful thing. To others it means sociality, to me it means analysis. As an aspiring computer scientist, I desire to understand the intersection of human cognition and security to support critical societal functions. I am interested in researching social engineering, phishing, and LLMs. The topic of human security drives my curiosity in cognitive science that leads to my pursuit to obtain a PhD in Computer Science.

My innate curiosity for cybersecurity is foreshadowed by my background in social interaction. Diversity in collaboration through my logical, secular humanist approach and neurodiverse thinking in human security embodies this notion. Diagnosed with autism, the forefront of my mind was always generating questions and responses to seemingly casual scenarios, while the backend was a machine of analysis and interpretations. The study of computers grasped all aspects of my attention for this reason. I question the state of an individual's social security in-person and online; drastically different yet incomprehensible. There is value in understanding how to leverage social constructs against individuals and how neurocognitive mechanisms impede such societal functions. People lose their identity, companies lose thousands of dollars, and perspectives are shaped through biased media conglomerates. There are endless streams of attacks on human cognition in everyday life. For instance, older adults are more likely to be susceptible to phishing and social engineering attacks than younger adults. This attack impacts a particularly vulnerable population and causes socio-economic issues. How can we detect the intent of these phishing emails utilizing LLMs? How can we detect the spread and misinformation about fake news in mass media utilizing CNNs? What LLMs are more efficient in these use cases? These are minimally answered questions I intend to answer to the fullest. Upon completing SREIP, I intend to finish planning my undergraduate thesis; focusing on utilizing LLMs to automate the creation of phishing emails to measure neurocognitive vulnerabilities. In the end, I want to contribute to and understand how we can leverage ethical hacking techniques and LLMs to improve human security.

I discovered my passion for vulnerability research upon joining the Social Cognitive and Affective Development Lab. By participating in Dr. Ebner's lab, I was exposed to complex cognition phenomena and research on aging and medicinal impairment. I gained first-hand insight on how biological and psychological components exacerbate decision-making through my current research which focuses on AI to prevent social engineering tactics. In particular, I am assisting in developing neural network models to identify deceptive components in fake news and de-linearizing psychological correlates of deep fake detection systems. Through writing research paper stimuli, identifying literature gaps, developing phishing network systems with Python, and attending PhD defenses on neuroscience, I have enhanced my understanding of practical research applications in computer and cognitive sciences.

The Society of Hispanic Professional Engineers (SHPE) has also impacted my interests in pursuing research and academia. It has given me unfathomable support in developing my professional and soft skills alongside shaping my leadership capabilities. The last two years have reflected my desire to serve from the heart; supporting graduate students and developing students' research profile. My first semester was encouraging others to succeed in research, the next was hosting a student-led diversity, equity, and inclusion STEM symposium. The range and contributions of these events are plentiful. I developed Cafécito con Grad; a coffee side chat session for graduate students to network, whereas Emerging Research Leaders was a

researcher-led program to guide freshmen in acquiring research positions. From Research Director to becoming the Graduate Coordinator of our chapter; it has given me the opportunity to impact the world through STEM awareness, access, support, and development. In doing so, I became increasingly more invested in a graduate career. Thus, I have committed to providing Hispanic engineers with the resources to succeed in graduate school through SHPE.

I've set my goals with a high standard, now it's time to take action. The first step to reaching my goals is participating in the SR-EIP. I am confident that learning and enhancing research through the SR-EIP will be the catalyst I need to develop my abilities in order to make a significant difference in the field of human security. With this, I will have a superior and abundant understanding of any situation and will apply newfound knowledge to develop solutions to complex problems. As the world emerges with enhanced technology, understanding humans and leveraging the power of computers is my responsibility to prepare to overcome these problems in cybersecurity.