Statement of Purpose – Charles Nwoye

Colorado State University – Computer Science (PhD)

In 2021, my alma mater was hit by a cyber-attack, which not only crippled academic activities but also caused me to lose an esteemed scholarship. This experience made me aware of the largely negative impact of cyber threats, emboldening my resolve to become a cyber-security specialist. Disturbingly, 87% of educational organizations in the United States have been victims of cyber-attacks. While this statistic highlights the vulnerability of academic institutions, institutions in other sectors—such as healthcare, finance, and energy—are even more frequent targets of cyber-attacks.

My research contributions reflect my zeal for advancing cybersecurity through innovative approaches. One of my works, "Next-Generation Protection Protocols and Procedures for Securing Critical Infrastructure," examines cutting-edge solutions such as zero-trust architectures, advanced encryption standards, and multi-factor authentication to safeguard essential systems. Another, "AI-Driven Anomaly Detection for Proactive Cybersecurity and Data Breach Prevention," focuses on applying machine learning techniques to detect and prevent threats and cyberattacks in real-time. These projects have improved my understanding of advanced algorithms and challenges like minimizing false positives, preparing me to carry out impactful research in the PhD program.

My background as a software engineer has not only equipped me with a solid foundation in writing clean code and deploying and managing cloud infrastructures using the Microsoft Azure cloud computing platform but has also deepened my understanding of building secure and scalable systems. Also, my expertise with database management systems (DBMS) and familiarity with Python machine learning libraries have enabled me to work on prediction algorithms, equipping me with the technical skills to contribute to research and practical applications.

The prestigious computer science program at Colorado State University provides the perfect platform for advancing my core interest in cybersecurity. The program's curriculum, which encompasses courses like computer security, machine learning, and quantitative security, aligns perfectly with my goals. What further distinguishes the program is the tremendous strength of its faculty; hence, an opportunity to learn from esteemed professors such as Indrakshi Ray, whose research on security and malicious abnormal detection using machine learning correlates with my interest in leveraging AI to enhance network defenses. Also, Dr. Indrajit Ray’s work in a proactive approach in identifying intrusions and also the design of intelligent agents for protecting users in cyberspace also profoundly aligns with my aspirations in safeguarding systems from threat actors.

My undergraduate years were filled with a plethora of activities that not only enhanced my technical skills but also strengthened my leadership abilities. Leading the IEEE student chapter of my university as Chair, I organized workshops on Python programming, web development, robotics, and machine learning, encouraging fellow students to acquire skills in the areas that sparked their interest. Through my participation in coding competitions and enrolling in Massive Open Online Courses (MOOCs) in advanced algorithms and data structures, I honed my skills in problem-solving and collaborative skills. My involvement as a member of the university’s badminton team further developed my resilience and appreciation of teamwork, especially when playing doubles.

As a first-generation college student, I recognize the transformative power of education, and I am committed to learning from and contributing to the vibrant academic and research community at the Colorado State University, with a desire to build a secure and interconnected future that promotes inclusivity across all social strata. I strongly believe in my potential to excel in a graduate program and to make lasting positive impacts if given an opportunity.