Statement of purpose

As I reflected on my undergraduate experience, I couldn't conceal my pleasure. Being born five years after Rwanda's genocide against the Tutsi and growing up as an orphan in a poor village, securing enough academic resources, let alone addressing basic life requirements, seemed like a distant dream. Like other marginalized communities, my orphaned family was disadvantaged in my society since we could not take advantage of opportunities due to limitations such as a lack of means and education. Despite our meager finances, I completed primary school and was awarded a scholarship for secondary school. *In Rwanda's educational system, high school education is divided into two levels: ordinary and advanced, with upper-secondary pupils obliged to pursue a mix of three main subjects*. I've always enjoyed mathematics, and after graduating from the ordinary level with honors, I enrolled in a rigorous high school course that combined Mathematics, Physics, and Computer Science to learn skills that will help me develop solutions to social difficulties facing minorities. I learned about AI research's influence on aiding minorities while working on a solution to allow tourists visiting Kicukiro, a suburb of Rwanda's capital, to engage with uneducated residents via speech translation. After completing my undergraduate studies, I am looking forward to expanding my expertise by joining the Master of Science in Engineering Artificial Intelligence (MS EAI) program at CMU.

My undergraduate degree at the African Leadership University prepared me for graduate school success. The experience at ALU introduced me to more advanced programming principles and allowed me to conduct research and contribute to projects utilizing languages such as Python, C++, Java, and others. As a bachelor's degree student in computer science, I took various courses that sharpened my AI skills. For instance, I took a machine learning elective in which I learned how to extract information from data and apply mathematical techniques to create interactive models. Apart from academia, I've always wanted to work in a setting where I could apply AI ideas to real-world problems. My first summer internship was a data scientist position at Curators University's coven labs; a Nigerian-based AI lab focused on the impact of AI research on rural Nigerian communities. I am currently enrolled in the GIZ NLP research boot camp, where I'm learning speech recognition and machine translation techniques, a subject in which I'm interested in developing voice translation solutions for low-income languages.

I am interested in leveraging AI research to address issues that underprivileged people confront. Despite the rise of artificial intelligence applications in various industries such as mobility, banking, among others, marginalized communities such as disabled individuals and low-income earners are more likely to encounter biased models or be neglected as users. According to a New York University lab study, biased AI systems arise from a lack of diversity among those who train the models. With the mission of tackling this challenge, I worked on a capstone project to employ object-based distance measurement to help minority blind people maintain social distance throughout the COVID-19 pandemic. Over 26.5 million blind individuals remained isolated as governments worldwide enacted measures such as social distancing, lockdowns, and other steps to stop the virus from spreading. My research proposed helping blind people navigate outdoors using computer vision by detecting humans

from live video input and computing the distance to alert the user if they approach another person closer than 1-meter. This research project improved my general understanding of convolutional neural networks and object detection and how AI research may help minorities overcome problems.

AI is expected to bring approximately $15.7 trillion to Africa's GDP by 2030. These data demonstrate the influence that current research on the subject will have on improving the living conditions of Africans, particularly minorities and disabled people. However, due to a lack of access to the appropriate educational system, there is a significant gap in the African AI research community. My classmates and I founded ALU AI Lab, which eventually became a chapter of Alliance4AI, motivated by the need to address this issue. I tutored and supported over 150 students as the program learning lead as they began their data science and AI careers. In addition, as a teaching assistant at ALU, I collaborated with the computer science faculty to build an after-class teaching approach to aid over 70 students enrolled in the Artificial Intelligence course in comprehending course topics. I am dedicated to tackling the scarcity of AI researchers who can propel the field forward.

Participating in the Master of Science in Engineering Artificial Intelligence (MS EAI) at Carnegie Mellon University will provide me with the knowledge and tools to explore answers to problems faced by minority groups in Africa. CMU is noted for its cutting-edge AI research that uses high-level technologies to solve societal issues. I was particularly impressed by David Vernon's work on cognitive computer vision systems. I believe that my experience with probabilistic and numerous models that provide data-driven tracking results will be a valuable asset to the CMU community. I am convinced that the skills and knowledge I will obtain at CMU will aid me in addressing the issues that disabled communities and other marginalized populations face.

Additional Information

I co-founded Creators Agency with the aim of solving problems in the local innovation ecosystem. This digital agency helps Rwandan small businesses establish an online presence and acquire traction through digital marketing. Even though over 23% of Rwandans have access to the internet, many citizens and businesses still engage in conventional physical contact. Not only has this proven unsustainable in terms of pandemics and scalability, but it also limits the amount of data available for analysis and training models to address other problems. Creators Agency offers cost-effective digital solutions for local businesses and projects. It paves the way for fourth-generation technologies by supplying the data and platforms needed to train unbiased models to address further challenges such as recommender systems, stock market predictions, etc. Joining Carnegie Mellon Africa will provide me with problem-solving strategies as well as best practices for generating solutions to address neglected communities in the African environment.