It felt like my arms were going to fall off and my heart was going to beat out of my chest. Every time I changed my bearing to follow the first lane on the athletics track, the wind turbulence battered my 5-ball juggling pattern from a different direction. As minutes went by, the accuracy of my throws degraded significantly and mid-air collisions happened more frequently. As sweat collected on the juggling balls and in my eyes, it became increasingly more difficult to make catches. Nevertheless, six minutes and 34 seconds after the gun went off, I became the world record holder for the fastest mile while juggling five objects.

"Joggling" has become an inseparable part of my identity. Not only has it been a way to challenge myself physically and mentally, but it has also given me a unique opportunity to help people around the world. I used the publicity from a few of my joggling world records to raise support for the primary school and children's home in Rhotia Valley, Tanzania. The community was introducing One-Laptop-Per-Child devices into the education system to allow young kids to become members of the 21st century, gain experience with computers, and to satisfy their own curiosities. From a cultural perspective, I found this program fascinating and inspiring, so I wanted to get involved. From a technological standpoint, I was excited to see low cost, efficient, and well-designed technology be applied constructively to solve problems, as I studied electrical engineering as an undergraduate.

However, this project in Rhotia Valley is merely the tip of the iceberg of the much broader and intricate challenge around which I plan to build a career. It is a fact that we are approaching the physical limit on the miniaturization of transistors and it will soon be necessary to design innovative technologies in order to keep up with Moore's Law and continue to make better computers. As stated by the influential computer pioneer, Alan Kay, "the best way to predict the future is to invent it." I anticipate that neuromorphic and bio-inspired engineering will be a significant player in the future of computing, and I plan to be involved in the development of this technology.

From a reductionist point of view, my training as a joggler has been symbolic of my interest in neuromorphic engineering. Just as my training leads to infinitesimal improvements in making accurate throws, predicting object trajectories, and minimizing physical exertion, neuromorphic systems inherently seek to build shortcuts and recognize patterns to optimize efficiency in performing specific tasks. My studies as an electrical engineer have given me a deep understanding of how today's CPUs work, from the molecular level to the global network level, but it was my personal curiosity that led me to branch out to other paradigms that force me to question every aspect about conventional electronic design. After a wide variety of research experiences, I have developed strong skills in innovation and creative thinking. Neuromorphic technology has huge advantages over the modern CPU, such as low power consumption and massively parallel and redundant processing. These advantages make it a promising vehicle for enabling the two changes in the world that are most important to me; making humans an interplanetary species and advancing personalized education.

According to the National Academy of Engineering, one of the greatest engineering challenges of the future is improving personalized learning. Although the proliferation of education through the One-Laptop-Per-Child program inspired me to use my abilities to get involved, I believe that much larger revolutions in education are on the horizon. It is certainly important to equip children worldwide with the internet, an encyclopedia with the entire knowledge of the human species, but personalizing each student's education in order to maximize his/her potential is a far greater task. While a human teacher can presumably provide a student with a very powerful and customized education, it is not logistically feasible to have one teacher for every student worldwide. Machine learning and neurosynaptics will be the key to cracking this global challenge.

As far as my interest in space, it is impossible to work at SpaceX and not dream about the future of human colonization on extraterrestrial worlds. Being around the brightest engineers and cutting-edge space technology has only galvanized me in my pursuit of helping humans become an interplanetary species. One of the current challenges with deep space exploration is that radiation

has the ability to flip bits and corrupt data. Modern CPUs are limited in space applications as they are highly susceptible to errors in the way data is bottlenecked through the processor without much redundancy. However, neuromorphic architecture is an appealing candidate for deep space missions, as it processes data in massive, parallel networks, in addition to consuming a fraction of the power that modern CPUs use.

The Machine Learning Research Group in the Department of Engineering Science at Oxford University is currently researching how to design more efficient and effective machine decision-making algorithms. This research focuses on using decisions of individuals or partial systems to drive decisions of the collective group. Why is it necessary that I attend Oxford University to study machine intelligence from the computer science perspective? To quote the influential computer scientist, Alan Kay, again, "those who are serious about software should build their own hardware." The Machine Learning Research Group studies software that is intimately related to neurosynaptic hardware architecture. Working alongside these internationally influential researchers in the field would greatly enhance my ability to grow in the area and gain the knowledge necessary to tackle complex problems at the mathematical, computational, software, and hardware levels. In order to truly use computing technology to its maximum potential, it is necessary to understand this coupling between hardware and software. Furthermore, I believe I would be an ideal fit for the interdisciplinary and diverse culture at Oxford University, as I would both immerse myself in activities that would help me grow as an individual and share my perspectives and personality with the community.

***I attest that this personal statement is my own work and is wholly truthful. Neither it nor any earlier draft has been edited by anyone other than me, nor has anyone else reviewed it to provide me with suggestions to improve it. I understand that any such editing or review would disqualify my application.***

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**Signature of Applicant**

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**Date**