**The Intellect’s Journey**

**Introduction**

For well over a decade, I have been fascinated with the idea that computers could achieve the same level of intelligence as humans. I would often ask my friends, “How cool would it be to combine human-level intelligence with the massive computing power of computers? A machine that could think like us, but infinitely faster. Imagine the possibilities!” Usually my friends responded by rolling their eyes, or started talking about how that kind of Artificial Intelligence (AI) would kill us all. (Thanks to Terminator, and about every other popular movie that features a nefarious AI!) Since I have never been content to just *think* about what an Artificial Intelligence would be capable of, I set out on a long journey to figure out how I could help make a (not-so-nefarious) AI a reality in my lifetime.

**Previous Experiences**

My fascination with AI largely remained a hobby until I took a course during my undergraduate studies, called “AI for Game Programming.” Up until that point, AI seemed to me an impossible problem to work on that only veteran Computer Science researchers could possibly contribute to. As my undergraduate advisor (Dr. Kenneth Stanley, who taught the course) can attest, I quickly discovered the power of evolutionary computation and its potential application in Artificial Intelligence. After the course finished, I began working on my undergraduate thesis with Dr. Stanley (described in my Previous Research statement), and in less than a year had taken what I learned in the classroom and applied it to a challenging problem in AI.

After graduating, I moved to Georgia to work as a software engineer at the Robins Air Force Base as a part of the DoD SMART Scholarship I had been awarded. There I solidified my core set of software engineering skills that I still use in my research today, and learned how to work on large projects as a member of an integrated software development team. After a year of working as a software engineer, I read Jeff Hawkins’ book “On Intelligence,” in which he eloquently described how I felt about AI ever since that undergraduate course: in order to build an AI, we must first understand the neurobiological processes underlying intelligence. Inspired by Hawkins’ book, I decided to pursue my research goals in graduate school with Dr. Christoph Adami, who is pioneering a new artificial brain model based off of Hawkins’ book.

In graduate school, I have been able to synthesize all of my previous experiences into my research today. Together with my colleagues in Dr. Adami’s lab, we have developed a new method for studying the evolution of animal behavior using evolving artificial brains, which is the first step in my plan to “reproduce the evolutionary path to human-level intelligence.” Additionally, taking from my software engineering background, I regularly co-host workshops to provide fellow scientists with the computational skills they require to complete their research. Although my journey has just begun, and the path that lies ahead of me is long and winding, my passion for research will see me through until I have accomplished my life’s goal of helping create an Artificial Intelligence.

**Intellectual Merit**

Perhaps the most noticeable trait about me that makes it clear I belong in academia is my inquisitive nature. Much to my parent’s and teacher’s chagrin, I would always ask “why?” or “how?” and would not settle until I had a suitable answer. This inquisitive nature drives my passion to ask and then find the answer to questions that currently have no answer, thus making research a natural state of mind for me. Furthermore, my work ethic -- motivated by my inquisitive nature -- has driven me to excel in my classwork as well as my research, and I have already completed a research project within my first year of graduate school that I am in the process of publishing.

Beyond individual work ethic, I have years of experience working in groups to collectively solve problems, ranging from group projects in class to research collaborations in the lab to working as a part of an integrated software development group. Time and time again, this experience has corroborated my belief that people can accomplish much more as a group than they would individually, and this belief fosters my efforts to collaborate within and between disciplines in research. I believe that this is one of the key lessons I have learned that will aid me in my academic pursuits.

Lastly, I have played a role in planning and writing numerous research proposals within the lab, which has given me insight into the craft of grant writing and securing funding for research. Given that securing funding for research is an integral part of academia, I believe these skills will be invaluable when I eventually become a professional in my field. Thus, I believe my personal and professional experiences have prepared me well for a career in graduate school, and eventually a professional career in academia.

**Broader Impacts**

I strongly believe in the importance of educating the next generation of adults about the importance of science and science education, and have pursued this thus far with the use of social media (e.g., blogging), participating in information sessions at museums, and interacting (as an email mentor and in-person) with undergraduate students to encourage them to pursue careers in STEM. Additionally, I am pursuing a new method of outreach with my colleagues in Dr. Adami’s lab, where we collaborate with video game designers to create a full-fledged multiplayer video game designed to *indirectly* teach the players about evolution. By making the concepts of evolution core features of the game and concentrating on making the video game “fun first,” we believe we can reach players that would otherwise not be interested in learning about evolution.

Professionally, I have actively promoted NSF BEACON’s goal of interdisciplinary research, so much so that half of my graduate curriculum focuses on Biology so I can better act as a mediator between Computer Science and Biology. I continually strive to push the boundary of what interdisciplinary collaborations are possible, and my research continues to benefit from these unconventional collaborations. As a part of these collaborations, I often share my knowledge of computational skills, oftentimes in formal workshops held at NSF BEACON.

**Conclusion**

Given my unorthodox approach to AI, I must continually push against the boundary of what is possible when computational systems are combined with biological experiments. Thus in the short term, I plan to complete my training in Michigan State University’s Ecology, Evolutionary  
Biology, and Behavior program. This training will better enable me to more effectively collaborate with biologists and behavioral scientists, which will be a key component of my research career.

In the long term, I hope to continue my journey along the long and winding path toward an evolved AI. As suggested in this statement, my professional home will always be academia, and I hope to pursue a career as a professor after completing my doctoral studies.