Statement of Purpose

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Throughout my life, I have been interested in finding a logical and scientific explanation of my day-to-day observations. Whether in class or in my hobbies, I tried to understand the nuances of how things work. I remember, right after one of the lectures of "Computer Programming" course in my first semester, I asked my teacher, "So, basically, we are trying to talk to a silicon chip here. How are we achieving that through include <iostream>?" The question was naïve at the time as I had not learnt about Computer Architecture yet. But such curiosity has been a part of everything I have experienced since childhood.

One of the key driving factors for my curiosity are the travel experiences I have had in the last several years. I am fortunate to have explored about 20 out of 28 states of India, all of them widely different in culture, language and nature. These myriad experiences have informed much of my thought process during my college years. I have learnt how each culture is unique and developed a desire to understand the intricacies of each and to capture the emotions of people I met as well as those evoked by nature landscapes. I was gifted my first camera in my high school and it sparked my interest in nature photography. Gradually, I observed how my perception and emotion affected my decision of the best view out of the infinitely many angles for shooting a particular object. For example, if I am in a happy mood, my images reflected the same feelings. Being a computer science major, my curiosity led me to question if there was a way of simulating this interpretation capabilities of human brain in a computer system. I was further amazed by the beauty of human brain while watching my nephew grow. He learnt emotional expression, interpretation and decision making when he did not even know how to speak. I developed a passion to learn about how I could replicate the cognition of human brain in a computer system, and started to explore research being done in the area of artificial intelligence (AI).

To pursue my interests, I participated in a 10-day workshop on Machine Learning Algorithms and Data Analytics organized by IEEE after my freshmen year. The workshop was a wonderful introduction to both the theoretical and applied research in machine learning. I was excited to learn about different learning algorithms and neural networks, as they aligned very well with my thinking. I followed up on those concepts through various online courses and discussions with the workshop faculty.

At the end of my sophomore year, I started working at Applied Cognitive Science (ACS) Lab at Indian Institute of Technology (IIT), Mandi, India with Dr. Varun Dutt. The lab focuses on cognitive modelling and decision making in applied domains. The goal of my project was to improve the causal understanding about landslides in the people living in landslide prone area. I developed a mathematical model on landslide risks and the resulting injury, fatality and property usage. Then I used the model to design a web-based Interactive Landslide Simulator (ILS). The simulator helps in educating the community as well as the government for adequate disaster preparedness. Through this experience, I got vivid insights into problem solving and structured approach to research from my mentor. I continued to work on the project beyond the summer as an off-site researcher for the ACS lab. After seven months of hard work, I had the opportunity to present my work at the Applied Human Factors and Ergonomics (AHFE) Conference - 2016 in Orlando, Florida, and at two other conferences in India. Our paper is currently under review by Springer Journal Editorial office - Landslides. Participating in the AHFE conference was a very unique and encouraging experience for me. I got to attend several interdisciplinary sessions and met passionate researchers doing excellent work in their respective areas. I envisioned myself to be a part of such passionate and committed community, and thus decided to follow a research path.

My decision for pursuing research has not only been inspired from my projects that went well, but also the ones that did not. Relating to my own personal experiences and discussions with researchers I met at AHFE and ACS Lab, I learnt about both external factors (like past research, practical feasibility, available technology, funding and luck), as well as internal factors, (like intelligence, persistence, teamwork and motivation), that decide if a research project may become successful or not. Throughout my projects, I have always viewed every failure as an opportunity to learn. This simple change in point of view has helped me get through a lot of ups and downs in my life. Again, I asked myself, "How can we make a computer think and perceive everything in ways that humans do?" And if that happens someday, then we can motivate so many lives around us.

In the long run I envision myself working on emotions in the field of artificial intelligence. Given a good research environment and guidance, I am confident of making a novel contribution to the field of AI.