Statement of Purpose

Name : Hardik

Program : Data Science M.S.

My interest in Data Science started when I read the book “An Introduction to Statistical Learning” during my college. My github repository for this book, in which I solved all questions using Python language, currently has more than 2300 starts, and around 600 forks. During this time, I also co-authored a peer reviewed research paper titled “Factors affecting Customers’ Satisfaction of Online Shopping” where I used my statistical knowledge to figure out the factors affecting the satisfaction of online shopping customers.

I started working in a startup in my final year of undergraduation where I worked in the domain of Computer Vision to automate the process of document processing. During this journey, I was highly influenced by my senior, who was in his last year of PhD, working mostly on Computer Vision. He introduced me to research life and always motivated me to go deeper into topics. During this phase, I implemented many algorithms related to statistics & probability and image processing from scratch. I used to regularly post them on Linkedin, which got me around 6000 followers on Linkedin, and also more than 100 followers on Github. One of my projects, titled “Fourier Transform GUI” got a mention in the official docs of Streamilt (which was used in the project), and I also received a handwritten note from the Streamilt team delivered at my home. Creating projects from scratch has always thrilled me, as there's a unique joy in building something from the ground up and seeing it come to life.

Driven by a passion for research, I joined the Indian Institute of Science (IISc), India’s top research institute, to work under Dr. Prathosh A.P. on a project titled 'Automatic Speech Recognition (ASR) Algorithm for Mandarin and Hindi Languages under Memory and Time Constraints.' This allowed me to train deep neural networks and optimize models for efficient memory and inference which are also essential skills in Computer Vision. We curated a train dataset of more than 5k hours for training ASR model, and were able to bring the inference time from 1.1 seconds to 0.5 seconds for a whisper-medium model using techniques like pruning and quantisation. Auditing IISc lectures sparked my interest in Mathematics, leading me to revisit books like *Linear Algebra Done Right* by Axler and *A First Course in Probability* by Ross. I made videos on Youtube giving solutions to some specific problems and some articles expanding on certain topics. Reading mathematics initially felt abstract, but revisiting it later brought a profound, intuitive understanding—transforming complex concepts into a captivating narrative.

I have worked part-time with OpenCV University for over three years, curating course content and assisting learners with over 1,500 queries. This role, with OpenCV.org's official course provider and the blog LearnOpenCV.com, enhanced my teaching skills, which I feel is very crucial for my future research career. Additionally, I delivered a seminar, 'Getting Started with Image Processing and Computer Vision with Python,' to undergraduates at PIET, sparking interest in Computer Vision among students.

My journey has been a blend of academic exploration, research, and practical application, where I delved into Data Science, Computer Vision, and Mathematics while contributing to impactful projects and mentoring others. Along the way, I honed my skills, fueled my curiosity, and shared knowledge with a broader community. However, I had to take a couple of breaks during this period to focus on my health, which taught me the importance of having a sustainable day routine in pursuing long-term goals.

My career goal is to conduct research in the domain of Computer Vision, a field I am deeply passionate about and have explored extensively from the ground up. With a strong mathematical foundation and hands-on experience in Data Science, Computer Vision, and Image Processing, I am well-prepared to advance in this domain. The Master's in Data Science program at the University of Wisconsin aligns perfectly with my aspirations, offering the opportunity to deepen my theoretical knowledge while gaining practical expertise in Computer Vision. I am particularly inspired by the work of Dr. Mohit Gupta and Dr. Yong Jae Lee at WisionLab. I am deeply curious about how technologies related to vision work at their core and am eager to explore the intricate details that drive advancements in this domain.