

## Statement Of Purpose

A guest lecture in my 10<sup>th</sup> grade from professor R. Sahadevan about 'Mathematics & Computer', fascinated my young mind; broadening my horizons on mathematics and slowly creating an interest within me for computers which later became my passion, convincing me to choose Computer Science as a major. An admission to the undergraduate program in Computer Science Engineering was a dream come true. I am more keen towards the fields of Machine Learning and Programming Automation as it involves a beautiful combination of mathematical problem-solving and programming through logic-based thinking, which excites me. My aim is to become a proficient programmer by enhancing my problem-solving skills which can be used to provide optimal and efficiently coded programs. A top-grade research facility of the university in USA seems like an ideal path for this goal.

I am graduating from a reputed University in India in the field of Computer Science Engineering and during my coursework until now I have cleared all semesters in good standing. These four years of my undergraduate studies took me through multiple projects, seminars, industrial visits, participation in various hackathons and competitive events which fueled up my passion for all aspects of computer engineering.

In my freshman year (2021), I joined my college team named 'Team Cipher' and we as a team had an opportunity to represent our college at National level in the prestigious DD Robocon Competition held at IIT Delhi for two consecutive years (2022 & 2023). During both these years, I got the opportunity to be a 'pit crew' where I played a crucial role of representing my team on the field. The reason behind was my dedication and hard work which enriched my interpersonal and collaboration skills and gave me hands-on knowledge of Programming Automation. I worked on path planning to build a robot that had to traverse the shortest distance to reach a certain goal state. I also worked with ROS using Machine Learning models, Computer Vision and micro-ros, which developed my proficiency in SLAM technology and Gazebo software.

This journey not only enhanced my technical abilities but also instilled in me a profound understanding of teamwork. In late 2022, I was promoted to Programming Lead of the team and had the responsibility of guiding and managing the team on the technical front for the year 2023. We were among the top 10 of the total 100 teams in India.

In my junior-year, I came across unused lecture recording cameras in our lecture rooms, and I found that they only had the hardware part of it. With appropriate server room permissions, I began a project to revive lecture capturing capabilities of these cameras. Despite the absence of dedicated software, my interest, knowledge, and skills in Computer Science helped me to successfully write a program to create a solution to correlate with academic schedules, start recording lectures and store recorded lectures data into college's NAS (Network Attached Storage). This project helped me understand and successfully tackle the complexities of Computer Networking, Data Structures and Databases. These efforts put by me aim to create an ongoing development platform for students to access recorded lectures of their chosen majors in their 'Moodle' page, which is college's official site for students to login and access regular lecture notes.

My senior-year project is based on the concept of Machine Learning, which gives me an opportunity to perceive research in fascinating core areas of Computer Engineering. Our project titled 'Enhancing Criminal Identification: Human Face Deblurring and Mask Detection', is serving as innovative initiative in the realm of Machine Learning & Artificial Intelligence. The motivation behind this was rooted in reality – CCTV cameras often fail to capture clear facial features of identified individuals; our project sought to bridge the gap between technology and security. In addition to the technical complexities of our project we faced another formidable task – publication of our project's paper. Our dedication, perseverance and countless hours of research culminated in the successful publishing of our literature paper at the international 'Springer ISBM Conference' held in Bangkok, Thailand, 7<sup>th</sup> & 8<sup>th</sup> September 2023. I must say it was a team effort! Also, we are currently working on our implementation paper for the same topic which is expected to be published in another highly regarded International Journal soon.

My strong interest in Professor Junsong Yuan's research in Computer Vision and Machine Learning aligns with my ongoing project involving deblurring using deep learning models. I look forward to drawing parallels between our project and his research. Also, as my interest in programming automation, I read his published paper on 'Non-Iterative SLAM.' I really liked the way of non-iterative solution unlike traditional SLAM method which we used, causing us a lot of computational power consumption on the Raspberry Pi. I wish I had come across this paper earlier as it would have been valuable to know about its content.

While I certainly possess a good technical background, I believe it is the fusion of these with soft skills which benefits overall development. As a Training & Placement Coordinator of my CS branch, I had the privilege of undertaking a leadership role that enhanced my interpersonal and networking skills. During this work, I actively contributed to crucial aspects of our college community by playing a key role in organizing and conducting career fair drives with company engineers and HRs for my peers, helping them to bridge the gap between their curriculum and industry needs.

In my bachelor's degree, there were times where I had to multitask; I was actively involved in multiple on-campus activities, simultaneously working on different projects, managing time, and achieving deadlines. Despite working tirelessly for hours, it did not affect my grades. These accomplishments of mine were fueled by motivation and discipline which I have inculcated within myself, which ensures me a focused approach. I believe this will help me succeed in my graduate program as well.

My focus now is a master's program to carry on advanced study in Computer Systems; not only through coursework but also by engaging in research-based studies. Since my junior year I have been researching various future possibilities and as I progressed through my academics, I started to feel something was missing. It was the urge to expand the knowledge which I gained during my undergraduate studies. Pursuing a master's degree will give me the opportunity to gain advanced knowledge through hands-on and research-based learning helping me to achieve my goal.

In future, I would like to be a researcher working on the development of statistical algorithms. This dedication fuels my pursuit of a master's program in computer engineering. The university at Buffalo with its advance courses in Computer Science & Engineering equipped with outstanding faculty, up to date infrastructure and dynamic environment of ongoing research in fields of Artificial Intelligence, Deep Learning and Programming Automation will create a strong foundation necessary for pursuing research-related studies. I am driven to contribute in equal measures to this academic community, developing mutual benefit. Therefore, making my parents and the University at Buffalo proud.