**Statement of purpose**

Manjit Ullal

Fan isn’t working, take it down, check the windings and the start capacitor and fix the one which isn’t’ working after preliminary checks. Tap is leaking, close the connection from the main outlet, unscrew the tap and put cotton threading and screw it back. Have throat pain, eat raw ginger 3-5 times a day, and gargle with salt water early morning and at night. Growing up, watching my dad working and teaching me his tricks were galvanizing. He was neither an architect, nor a formal engineer nor a scientist nor a doctor, yet he acted in all of those capacities, inspiring experimentation, research and independent action in me.

With the curiosity piqued in me, entrenched by lifelong quest of knowledge acquisition and driven by persistence, I started seeking different perspectives and facets to expand my intellect and ability. My choice of free time activities in a way reflects this, long distance running, football, sketching, meditation, obstacle racing, music, guitar, reading and writing. Running marathon has taught me goal setting, patience and given me endurance. Football has showed me how to stay nimble on feet and make the right decisions under pressure and lead the team. Playing guitar/sketching have shown the necessity of constant practice and ear/eye for the details. Eclectic reading has allowed me to gain ideas and wisdom from the lives and experiences of others. Writing/blogging has enabled me to share my learning’s with the rest of the world.

Coming from a lower middle class family, the need for highly constrained optimization and creative thinking is real life necessity. Even though my parents were not formally educated they have inspired me to instil the values of educational excellence and integrity through their hard work, discipline, vision and ethics. My professional ambition is product of those principles.

I found the Computer Science stream appealing with its emphasis on logic and critical thinking. Computer is an instant feedback system; I could find alternative ways to solve a problem and know the result immediately, just like in favourite sport, football. I could use the power of computation to test my ideas and advance in all the areas of my earlier interests with bare minimum cost. As a result, I chose computer science for my under graduation.

Undergraduate study gave me a solid foundation in the concepts of computer science. I learnt the importance of cutting edge research and development at Bharat Electronics Limited (BEL), India’s leading aerospace and defence Company, while working on the electro optic sensor simulation project. I developed simulation software that would predict infrared signatures of moving objects like ship and aircraft. The simulations would be used to test the actual sensors on site that would be used for coastal surveillance. The solution reduced the time to market of the sensor and created the benefit of testing the device at any location, compared to the high cost of the on-site real-time test. Analysing the objects for simulation and implementing the intrusion system got me interested in machine learning. Working on the rudiments of pattern detection for surveillance through machine learning, I realized immense potential in the technique.

For the final year undergraduate project, I incorporated multiple streams of technology like Symbian, Java, Digital electronics, database and display systems, developing a system to benefit personal transport. I created a system which will track the location of the bus using GSM phone and transfer that location to the base location from where, the details of the bus, the estimate arrival time and current location would be displayed to the passenger who is waiting for the bus. The estimated arrival time was calculated by analysing historical data of travel duration. The integration of known technology in unique ways can create high value to the consumer was my key take away from the project. Consequently I earned Bachelor of Engineering in computer science from **Sir M Visvesvaraya Institute of Technology.**

A good academic track-record and strong performance in training was instrumental in securing me a job at **Infosys Limited**, which is a leading consulting firm in the use of data driven Artificial Intelligence (AI) to drastically improve productivity of the clients.

I have enjoyed working in investment banking domain for 8 years as an engineer, designing and developing software solutions to client requirements and my experience has confirmed my initial hunch. Artificial Intelligence and Machine Learning is the one of the game changer in the Information age. Data is at the core of decision making and the industry is adopting data driven AI to innovate and improve efficiency, which will eventually permeate to enrich all walks of our lives.

I want to be at the forefront of the AI innovation and make my contribution, Therefore I want to return to academia to build the in-depth knowledge of core computer science with focus on AI and Machine Learning through the graduate study. Even though I have gained proficiency in programming, application development and many software packages, my current skill-set is inadequate to innovate the existing complex computational designs using AI, as that would require deeper study of each as aspect of software engineering and concepts of AI, meaning I needed fastidious study of computational processes, algorithmic efficiency, architecture, and supporting technologies crafted by experts in the field to create the foundation of deep expertise, readily applicable to the field. Graduate study will not only complement my experience but also grant me opportunities to work on academic research to advance my knowledge.

Currently my pursuit of excellence in graduate education has led me to **University of Buffalo**. Some of the recent projects on data-transfer and autonomous transport done at Buffalo are not only enchanting but also have high potential, showcasing the profound knowledge students have gained through the program. Buffalo’s special focus on Artificial Intelligence and its applications align with my interests. My learning’s have always accelerated when I have worked with highly accomplished active learners; therefore I wish to study the concepts of AI under the guidance of Professor Varun Chandola and Venu Govindaraju of Buffalo, whose work in the field of pattern recognition, machine learning and data analytics echo with me, as I am pursuing the same field. With the rich tradition, venerated faculty, industry affiliation and multi-cultural environment; Buffalo is certainly a centre for excellence. I believe the graduate study at Buffalo will be most agreeable and logical extension of my academic and work experience and I will be grateful to be part of Buffalo’s fraternity and to continue onto to the path of growth.