

Statement of Purpose

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Data science has brought about a paradigm shift in modern computing. The congruence of immense computational power, unlimited data, and intricate algorithms has made seemingly implausible tasks plausible. From product recommendations based on past search history, to push advertisements on social media sites, to applications in Biotechnology and healthcare systems, Data Science is leveraging technology to drive business decisions. For me, the most exciting feature about data is its unparalleled ubiquity. It was during my stint as a Quality Manager at ITC, an FMCG company that the importance of data rang truest for me. Backing all my decisions with data was the only way to convince my production team to take any step ranging from stopping machines for maintenance to changing set-points, rejecting non-conforming products to finding training needs for the machine crew. My industry experience has ignited the desire to delve deeper into Machine learning, Big-Data and Artificial Intelligence. Data Science holds the key to technological innovations and an MS from the University of Michigan will help me unlock the digital conundrum and explore the complete spectrum of this challenging domain.

A strong mathematical aptitude and a nascent interest in programming saw me opting for the Engineering stream. Cracking the JEE Mains with an All India Rank of 8500 in from among 13 Lakh students, I secured admission in the BE program at NIT Warangal, one of the best Engineering colleges in India. Apart from the core curriculum of Chemical Engineering, my undergraduate years laid a sound foundation of data structures, algorithms, Engineering mathematics and Statistics along with OOPS and C++ (you can mention your specific courses here). Intensive coursework, challenging projects and additional reading during my under-graduation fuelled my interest in Artificial Intelligence, Data Analytics and Algorithms. Industry internships provided a platform to test my learning, beginning with a summer internship at IIT-Guwahati. I undertook linear programming to implement an algorithm to optimize planning and scheduling operations in the Food industries using CPLEX. The internship was an immersive learning experience, gaining insights into binary linear programming and mathematical interpretation of real-life constraints. The most significant learning has been the KITES summer internship with ITC Limited in the Indian Tobacco Division. Working on a real-time project to mitigate the HCFO (Hot Coal Fall Out) defect from cigarettes, I delved deep into Design of Experiment (DOE) and Statistical Analysis. Correlating all processing variables & quality parameters with respect to firmness, I used statistical tools, Design of Experiments, ANOVA, Hypothesis testing, Sample sizing and Repeatability & Reproducibility using Minitab Software and Excel. Deducing parameter values for consistent firmness with nil consequential impact and baseline firmness for the least Fall-Out tendency, I came up with a linear equation to predict the Firmness with 96% accuracy. The successful mitigation of one of the perennial defects, HCFO, from the cigarette, was instrumental in fetching me a rewarding Pre-Placement Offer at the company along with accolades and an excellent grade in project. Other projects included a literature review on the optimization of

planning and scheduling operations in the Food industries (using IBM ILOG Optimization suite) at IIT Guwahati and a major project using ASPEN software for Large Scale Production of ASPIRIN. Make-a-thon, NITW 2017 gave me an opportunity to work on a real-life project to link the Krishna and Godavari river waters using pipelines and pumping stations with various constraints. The practical learning and consolidation of knowledge through projects translated into a cumulative GPA of 7.82/10, with the experiences transforming me from a curious student to a budding data scientist. Besides academics, my zeal for co-curricular activities included volunteering at the Aashyam Foundation, pursuing Chess and Volleyball, to blood donation and being a member of the film committee, Nature, Painting & IEI Club as well as Sub-Core of Logistic and Security team in Technozion 2017.

Post my graduation, I joined ITC-Munger as an Assistant Manager, Quality, working on day-to-day quality operations using various quality tools and hypothesis testing. My greatest learning experience on the job has been the **"Cigarette Ex-Pack Moisture Consistency Project"** which exposed me to multivariate data analysis and modeling techniques such as PCA, Random-forest and Machine Learning Models (Linear Regression, Neural Networks). Comparing analysis of various error/evaluation metrics of different prediction models, I developed a Time Series machine-learning model to predict KLD and TC dryer set points to achieve consistent Ex- pack moisture within the range of 13.5 +/- 0.3 % (93% accuracy). Real-world experience has made me realize that data science and analytics directly impact consumer satisfaction and the bottom line of an organization. To drive innovation in this space, I need to acquire in-depth statistical and computational skills to deal with the volume, velocity, and veracity of data. An MS in Data Science is thus an ideal platform to gain necessary expertise and launch my dreams of a stellar career in data science.

The University of Michigan is one of the leading US Universities offering cutting-edge programs in Data Science. The multidisciplinary MS Program in Data Science is a perfect amalgamation of advanced technical courses ranging from Machine Learning, Big Data Analytics, Data Mining, Data Visualization, Data Engineering, Statistical Analysis and Deep Learning. The option to specialize in Computational Intelligence, Business Analytics, Applications or Big Data Informatics will enable me to leverage analytics to extract meaning from raw data, process, analyze and present it for data driven decision-making. Furthermore, the capstone project will help me to accelerate and consolidate my knowledge through a practical implementation. The state-of-the-art laboratories and research facilities at Michigan, along with the opportunity to learn under the guidance of pre-eminent faculties will be a flagship learning experience. I am especially drawn towards the work of Prof. Clayton Scott, whose research in machine learning aligns with my interest. In the near future, I aspire to work at the intersection of Big Data and AI as a data scientist or analyst. Gaining relevant experience, I plan to venture into my own-startup in India, dedicated to solving business criticalities using Data Science and Consultancy along with mentoring the young minds in my organization to excel in the domain of Analytics.

Curiosity is what led me to Data Science, but perseverance, resilience and the sheer joy of coding draws me towards higher learning. What germinated as a curiosity has developed into a passion, igniting my desire to gain advanced knowledge at the University of Michigan. While there will be equally deserving candidates for this comprehensive program, I sincerely believe that my analytics background, deep academic orientation, and strong commitment to research sets me apart. With a diverse international student community enriched by innumerable opportunities to learn and to contribute, Michigan University will surely empower the future innovator and researcher in me to embrace technological challenges in the data-science landscape.