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Statement of Purpose

of Sashank Gondala (CS Masters applicant for Fall—2016)

Imagine a world where a computer can compose symphonies like Mozarts or sonnets like Shakespeares. A world where machines think and understand in the same way as humans do, building such a world is my motivation to do a Masters in Computer Science.

Right from childhood, I developed an interest in mathematics and excelled at it. In my 10th Grade, I secured 7th position in State Level Mathematics Olympiad conducted by APAMT - Andhra Pradesh Association of Mathematics Teachers. I was also selected to attend prestigious OCSC camps conducted by HBCSE - These are conducted by the government of India and only 35 students from all over India are chosen and are trained to represent India in various international olympiads. After my schooling, I wanted to pursue Computer Science because it gives me the ability to make a difference to the world using mathematics and logic. My hard working nature and determined approach helped me in securing All India 14th rank in IIT - Joint Entrance Examination competing with about 500,000 students. Thus, I got into Computer Science department at IIT Bombay, which is considered as one of the best places for imparting computer education in India and a place dreamt of by every aspirant of Computer Science. College has been a very fruitful experience. The courses offered here provided me a solid foundation in the various areas of Computer Science and helped me to expand my horizons further.

During my last semester, I took a course on Artificial Intelligence (AI). I was interested in the course attributing to my innate interest in intelligent machines. As a part of it, I gave a talk on solving the Travelling Salesman Problem (TSP) using Particle Swarm Optimisation (PSO) and discussed its performance with Genetic Algorithm. To this end, I performed literature survey on TSP, PSO and Genetic algorithms. After studying these algorithms, I got more interested in the field and studied several other publications from IEEE Transactions on Evolutionary Computation and Elseviers journals on Artificial Intelligence. I was particularly fascinated by Prof. Marco Dorigos ideas of applying ants behaviour to AI and methods like Simulated Annealing. This was my first venture into studying the research papers and I found studying the research papers very interesting. After working on this, I inculcated a habit of going a bit further in the process of learning. The very idea of taking an existing problem and tackling it using known methods from diverse fields and trying to improvise the solution has drawn me further towards pursuing a career in research. I see masters as a first step in this process.

Currently, I am working on my undergraduate thesis in the area of cloud security under the guidance of Prof. R.K. Shyamasundar. We are extending Readers-Writers Flow Model (RWFM) to MapReduce systems like Hadoop. RWFM is a novel information flow control model called using explicit readers and writers that provides a label model for capturing relationships and constraints of information flow among the stakeholders. To this end, I am working with the internals of Hadoop Distributed File System and Hadoop MapReduce system and finding ways to integrate this model with Hadoop.

I was always interested in practical applications of the learned concepts. Hence, I did my summer internships in industry.

In the summer of 2014, I was a software intern at a new startup - Housing.com, an online real estate portal. I worked on creating a conversion funnel, a web application that shows the percentage of users dropping at every page in the website from start till end. Every action of a user/viewer, such as a click or opening a new page is collected into a database. I devised a linear-time algorithm that runs on this database and gives what percentage of users are actually availing the services provided by the portal and shows what percentage of people dropped off at various locations in between. As most websites tend to be changed at frequent intervals, I made the process flexible enough that the system would work with minor tweaks even if the original website is modified. I used various technologies like Django and NoSQL databases. The final implemented version is a scalable one and could handle up to 30 million entries within 4 seconds. This tool has found a widespread use by marketing people, User Interface designers to perform A/B testing, and every

other department that concerns with increasing user traffic into the website.

After working at a startup, I wanted to work at an established company that is an expert in its field so that I could learn more from the experienced professionals working there. At the end of my junior year, I secured an internship at Amazon, as a software developer. I worked in the team that deals with customized products at Amazon [1] My work involved building API Test Suites for two internal APIs of Amazon. For this, I prepared detailed test plans, acceptance criteria and test scenarios for each service and implemented them using workflow engines, TestNG and Java. Thus, I had a good experience and completed my internship to the utmost satisfaction of my mentors.

I strongly believe that both academics and extracurriculars play a vital role in moulding ones personality. I have enthusiastically participated in many extracurricular activities both at school and undergraduate level. I secured State 2nd position in presentation and communication skills test in my 8th Grade. In my sophomore year too, I worked as a class representative for a batch of 98 people. I also worked for the college newspaper and contributed to an article about Academic Ethics.

While undergrad provided me with a great opportunity to explore various topics in breadth, I couldnt explore any particular topic in depth. Masters would provide me with the right skillset needed for the career I aim for, one that involves solving complex problems and innovation in the fields of Artificial Intelligence (AI) and Machine Learning (ML). The way to go about it is only by standing on the shoulders of giants and studying at XYZ would be the right way of doing so. XYZ has an active research community in the fields of AI and ML. I am particularly interested in the work going on in the ABC lab and their implementations. I wish to work in those labs and under the able guidance of professors. After my masters, I envision myself contributing to these fields, trying to make machines more intelligent and bringing them closer to humans more than ever.

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[1] http://www.amazon.com/b?node=11032013011, (As it is still in beta, the web link might change)