

Statement of Purpose

Let me introduce myself, I am Mahdy Nasr in my final semester of Computer Engineering B.S (ABET accredited) at Eastern Mediterranean University. My graduation will be on 31st January 2018 (graduating one semester earlier) with a CGPA of 4.0/4.0. I have been the top of my class and department for 6 consecutive semesters with a high honor status.

My interest in this field started when I was in intermediate school reading my older sister's textbook "c++ How to Program", it occurred to me the beauty and the possibilities we can unlock with programming and I started immediately by writing my first calculator program that year. Gradually I started to realize that math is also very important for computer science, as a result of this, I gave so much attention to the mathematical courses in my undergraduate studies. Talking about math reminds me of a time when I applied my programming skills to solve mathematical problems. I created a program to solve a system of equations by applying linear algebra techniques and also built another program that simulates matrix transformation with the use of OpenGL/C++ which brought about a wonderful result that surprised even my instructor.

Computer science splits into multiple specialities, but the one that attracts me most is artificial intelligence (AI) with emphasis on machine learning. My interest in AI started when I participated in a gaming competition and I was responsible for adding a very simple AI algorithm to the game by applying the shortest path algorithm. It was amazing to see how enemies in the game took the shortest path in the map to catch the player. However, what I really got as result of this competition more than achieving first place with my team was the motivation to concentrate more on AI. Furthermore, when I started to practice problem-solving in preparation for the ACM ICPC and IEEEExtreme competitions, I encountered a lot of AI algorithms and problems, which I always enjoyed solving. My love for AI even led me to take an area elective offered at our department, Functional and Logic Programming. The memorable experiences I had in this course have made it one of best courses I have ever taken. The instructor of the course, Dr. Zaki Beyram made us understand how functional and logic programming languages are so beneficial to AI and machine learning. It really touches me how everything can be symbolized naturally as functions, because the power of doing this is just great. For instance, implementing the Quicksort algorithm in a Functional language is like

defining Quicksort in a natural way, which can be achieved in merely 4 lines. The peak of my excitement was reached when I created a very elegant and efficient permutation function using Haskell in just three lines which was unique and completely different than what was in the textbook or the solution of my instructor.

You might ask why I focus on machine learning especially? well, it was the solution for a problem I encountered during a summer holiday while I was sitting with some engineers discussing the the current manual based and error prone method for determining the price of properties in Gulf countries like Saudi Arabia. One of them asked me to work with him to develop a mathematical model that uses the available pricing records to estimate a price for new properties. While working on this I realized that there is a field that deals with such problems, I was instantly inspired by this. Furthermore, my interest for research led me to spend a lot of my free time with graduate students, and this exposed me to the problems they solved. I was fascinated to learn that machine learning contributes a lot to areas of research in computer vision. This further motivated me.

Having been assigned a graduation project by our department to make a platform that facilitates a better connection between instructors and students so as to consequently increase their academic experience. I found this as an avenue to sharpen my machine learning skills by making an adaptive social network that will help increase the level of student performance and reduce the distance between instructors, students and department as a whole.

I am interested in working on a variety of topics related to machine learning like working in adaptive systems, computer vision, security prediction and enhancing network algorithms like routing and so on using ML. Despite this, I want the focus of my work to be on argumentative logic recognition and reasoning because I believe working in this area will make a very strong impact on the society especially in making correct decisions that will help to enhance the society. For this purpose I am very passionate about research in this area. Nevertheless as indicated earlier there are many areas of research in machine learning and there is definitely the need for more researchers.

I have set my target to follow an academic path by doing research and to eventually pursue a PhD because of the interest I have in this young computer science field that has so much

opportunities. As a secondary goal, I am also interested in running a startup, but I think this can wait until after I have received a PhD and gained enough knowledge that will help me create the next shining startup.

I was the chairman of the ACM student chapter club for the 2016-2017 academic session and it was virtually dead until I revived it. I started web development sessions for new students in our department to make programming more exciting and enjoyable. In addition to this, I also created a preparatory course for problem-solving under the supervision of Dr. Adnan Acan to introduce students to problem-solving techniques and algorithms. Furthermore, because of my interest in competitive programming I also participated in the IEEEExtreme programming contest with a team of 2 other students, and we got first place in our university and came 4th in Turkey. My eagerness to run a startup led me to try my own while I was in my 6th semester with 2 other people and we were able to successfully manage it while also studying, but this wasn't easy. Despite the fact that we got an investment offer I decided to give the idea of running a startup a break in order to concentrate more on my career.

I am really motivated to study at the University of Toronto knowing how strong it is and I prefer it to all the other universities in Canada because of its research reputation, as well as its competitive and diverse atmosphere. I see Canada as the best place for international students who want to pursue their studies with convenience because of its openness and the welcoming attitude of Canadians. I really hope I will be accepted in order to have the opportunity to contribute to the cutting edge research at UofT.

Thank you very much for reading my statement. I hope to hear a positive response from you soon.