**UNC CHARLOTTE – COMPUTING AND INFORMATION SYSTEMS**
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**Statement of Purpose** **February 7th, 2019**

An android assistant with a defective personality chip, sense of humor, and sarcastic charm; a healthcare robot that looks like a marshmallow and acts like a friend; and an android's daughter who learned how to feel – these fictional characters all led me to where I am today. These are the stories that inspired me as I grew up and pushed me to pursue studies in computer science. I wanted these dreams to come true. I wanted that sarcastic android to exist. I wanted to see that squishy robot roaming around, helping patients. And I wanted to be the one to help bring these stories to life.

I am an undergraduate, early-master's student here at UNC Charlotte studying Computer Science (major) and Cognitive Science (minor) graduating this May, and am very enthusiastic about research. I still remember the first time I walked into my advisor's office – an awkward, first-semester freshman – declaring that I wanted to do research with artificial intelligence. At the time, I had no idea just how widespread the field of A.I. was. But over time, I've learned so much about research, teaching, and my field of interest thanks to my mentors, instructors, and friends. I am very happy where I am right now, and hope to continue my studies and gain further experiences through a PhD, and possibly even the GAANN Fellowship.

When I first began my collegiate career, I was very lucky to have been accepted as a teaching assistant (TA) for my advisor and now long-time mentor, Dr. Dorodchi. Before this, I had never thought about the possibility of teaching and even found the idea terrifying. Now, many of my most treasured memories come from my experiences here (except for those Saturday morning meetings!). I improved my communication skills, helped make assignments, tests, and activities, worked alongside my peers (and now good friends) to help completely redesign the labs, and spent a summer doing research on the use of blogs for student reflections in the course, which we then incorporated. I've learned and grown so much, and I thank Dr. Dorodchi for that – the amount of trust and responsibility he put in us helped challenge and push us further. It was a lot of work – I have really grown to appreciate the amount of time and dedication it must take for instructors – but seeing the students succeed made everything worthwhile. Perhaps one day, I could learn enough to teach a course myself.

In parallel with these teaching experiences, I was also given guidance towards research. In some of my earliest experiences, I worked with Dr. Dorodchi to make various posters relating to the ITSC 1212 course and educational pedagogies. One poster, titled *Reflections are Good! Analysis of Combinations of Grades and Students' Reflections using Learning Analytics*, was presented by a peer at SIGCSE 2018. Here, we described the various types of reflective activities used in the ITSC 1212 course over many semesters, and how this information helped predict student success. I was unable to attend, but was excited to learn that we had won the Council for Undergraduate Research Award.

I was able to get involved early on with the Learning Analytics project in the Spring 2017 semester. In my first experience with the group, I worked under the PhD students to learn about data preprocessing, using Python and the Pandas library for the first time, and Sequence Analytics, which emphasizes the importance of features' temporal aspects. With this gained experience, as well as my TA experiences in helping Dr. Dorodchi design the course model and various student

reflections, I was able to become second author on the paper titled *Design and Implementation of an Activity-Based Introductory Computer Science Course (CS1) with Periodic Reflections Validated by Learning Analytics*. Here, I worked with Dr. Dorodchi, PhD students (Mohammad Java Mahzoon, Stephen MacNeil, and Nasrin Dehbozorgi), and a peer (Devansh Desai). I brought all my previous experiences together to help write this paper by completing a literature review and helping to discuss the methodologies, data collection process, and analysis of results (accuracies of student success predictions due to the addition of reflection data, and the importance of this). I then helped present this work at the 2018 IEEE Frontiers in Education (FIE) Conference. Attending the conference was an amazing experience and I hope to improve my writing, presenting, and networking skills in the future. Overall, I very much enjoyed working on a team for research, writing, and finally getting to publish and present at a conference, and would hope to continue to do so.

In Fall 2018, I rejoined the Learning Analytics project as an RA to help create interactive learning analytics tools (Course Analytics and Degree Analytics) for advisors, faculty, and administrators/department chairs. The goal of these tools is to help users predict and catch at-risk students in a course or in their program(s) early on. My first responsibilities included documenting and implementing Canvas APIs for retrieving student data. I also designed a prototype for the Degree Analytics tool based on continuous feedback. More recently, we worked on performing pilot user studies for improvements and are now starting to implement the real application. I am also now currently in charge of creating the prototype for the Course Analytics tool.

Furthermore, I participated in the Charlotte Research Scholars (CRS) program in the Summer of 2018 under Dr. Dorodchi's supervision and Dr. Harden (from the CATO College of Education) as education consultant. The goals of this project were to learn more about student engagement and what behavioral cues signified an interaction. I began with a literature review on Social Signal Processing. We then collected student video data from the ITSC 1212 course, as well as manual observations through a method I designed and adjusted through team feedback. We also conducted student focus groups at the end of the summer session evaluating the interventions and tools. Some interesting patterns surfaced through these interviews and videos such as the relationship between tension during learning and relaxation after learning. I then presented our work at the CRS Undergraduate Research Symposium.

As a PhD applicant, I would be very interested in research involved with artificial general intelligence (AGI). This had been my interest since I was a freshman and would love to become more involved in this area, such as by first learning about current research like Numenta's HTM Theory and/or the OpenCog project. I am also fascinated by computational human behavior modelling, areas of cognitive science and neuroscience, and biologically inspired computing. I believe that in order to work on AGI, it is important to also better understand ourselves first, hence my interest in these areas. Because of this, I am also very interested in Dr. Shaikh's work surrounding human behavior, such as some of her current work on emotion, emotion regulation, and emotion contagion. Furthermore, I want to be able to help others through my work, and so I am also interested in A.I. applications in areas like education. As a TA, I really enjoyed working with the students and forming those connections. I would like to continue helping students and working to create better learning environments and experiences for them through both teaching and research. There is so much prospect for artificial intelligence research; I am excited for the future and all of its possibilities. Because of my existing experiences and enthusiasm to go further, I hope to be considered for UNC Charlotte's PhD program as well as the GAANN Fellowship. Thank you!