

## Progress Report 1

### **Overview:**

From the general viewpoint, my team's goal is to demonstrate that when the CADRE rover gets stuck in a ditch, it will be able to properly communicate with two vipers that will push it out of the ditch. My team's goal is to have the use case demonstration done by April 21st. We also have a conference on March 20th where we will also be presenting our progress with this project. In this project, I am specifically working in the subgroup that focuses on the registration and authentication part of the system. Our program allows authorized people to enter the system and register agents. The system authenticates users trying to gain access by verifying their private key which is specific to them. There are a lot of tasks that need to be done in this process of authenticating authorized users and registering new agents which I am working on. We are working on a very tight schedule, so it's important to keep up and maintain good progress. This is something that hasn't been done before which meets the goal of innovation of the laboratory which is very exciting. By achieving this communication across multiple platforms, we have the ability to present something that is completely new.

### **Approach:**

Since the start of the internship, I have focused on starting on my tasks early and keeping consistent communication with my team. As a busy student, it can be challenging to balance everything, but the key is to not fall behind and communicate with my mentor and team lead. At the start of the week, I have a small meeting with just my subgroup, which includes my team members (other SIRI interns in my subgroup), my team lead, and my mentor. The larger, weekly meetings can become quite general since we don't have too much time to dive into everyone's week, these smaller meetings are crucial. In these smaller meetings, we discuss our schedules for the week, the upcoming tasks that need to be done, the dates we want to have the tasks completed by, and the progress we have made so far. This system seems to work great because we get to have time to dive deep into everything we are doing and maintain effective communication and collaboration. Additionally, when we meet with all of the interns in my section, we update the entire team on the general progress we have made. This also contributes to our team maintaining effective collaboration and communication.

### **Progress:**

So far, I have made a lot of progress. My first couple of weeks were filled with downloading everything I needed onto my computer and familiarizing myself with the project as a whole. I took a lot of time to look through what had already been done in order to understand what was left that still needed to be done. My job is to work on a Python program that authenticates users and registers new entities. Specifically, I am working on implementing missing functions or adding to existing functions to make the program more sophisticated. I

recently just finished the function for randomizing the Kafka Topic Name for when an authorized personnel is trying to register an agent. The function involves adding a random string (or set of characters) to the Kafka Topic Name and then checking to see if it already exists in the database. If it doesn't, that will be the name of the entity, if it does, the computer will regenerate a random string. I also recently conducted some research on what the best way to host this HSML API would be in order to keep it secure. Based on our wants, needs, and budget, I found that it would be best to host it in the EC2 container. This week, I agreed on this conclusion with my team lead and mentor as well. My next step forward is adding a timestamp to the program to see how long it is taking the program to authenticate a person and register an entity. My team lead has also created a file of functions that still need to be completed, so I will be going through those throughout this next month and trying to get as much done as possible.

**Challenges:**

I would say my biggest challenge so far was understanding how to run the server and database on my personal computer (not the ones in the labs) so that I could work from home if needed. This was an issue for me because most of these things, like Kafka and Docker, were new to me so it was a little bit difficult to navigate. However, I am very thankful for all of the help my team lead gave me as she walked me through the process of setting them up and gave me the resources to help me figure it out. I think starting anything new can be difficult, but I feel very supported here and believe this support has allowed me to make so much progress already. I feel very familiar with everything needed for what I am working on, so I am feeling confident that I will continue to make good progress. If this challenge does come up again, I am confident that I will understand how to fix the issue, given the resources my team lead has provided me. I also know that my team lead and mentor are very helpful and would aid me in overcoming this challenge.

**Resources:**

As I touched on earlier, my team lead has provided me with all of the resources that I need as of now in order to continue making good progress. I really appreciate her organization with everything, it has really helped me understand what our goals are and what still needs to be done in order to meet those goals. My mentor is also very communicative and supportive which has been extremely helpful. Finally, I have everything working on my computer as of now, so I don't think there are any other resources I need at the moment.