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Section 349B - Affiliate

Project Plan

Objective:

To begin, the goal of this project is to successfully rescue a rover that has been stuck in a ditch, utilizing vipers. This, of course, is a very general overview. To complete this task, we will need to ensure that there is proper communication between the CADRE rover and the vipers. Through the proper communication and execution of the plan, we will be able to use the vipers to push the CADRE rover out of the ditch and rescue it successfully! So far, a virtual environment has been created using NVIDIA's Omniverse which I have familiarized myself with. The project is still in its young stages, but the goal is to have this completed by the end of April. We ideally would want to be almost done by the middle of April to have time to make sure everything is working properly and tied together. With hard work and dedication, this can be a very realistic goal.

Approach:

I will be working in the group that overlooks the HSML implementation, model storage, and authentication protocol. This essentially means we are in charge of making sure the system is secure and the data is stored properly. In a group of about four, we will be working on these tasks to make sure the system is secure. Since I have some experience in Python and C++, I would like to adapt the Python/C++ Kafka Consumer/Producer scripts to HSML. I will also be modifying the JSON files to use HSML schema. It will be a challenge to take on HSML since it is a new concept for me, but I have been familiarizing myself with the GitHub files and reading through the documentation to help myself understand. I have also been going into the lab to meet with my team leader to shadow her as she works on the project. This has helped me build a better understanding of the project as a whole and what my role will be in making this a successful project. We will need computers with GPUs to use programs like NVIDIA's Omniverse, but we have several computers in the lab that can be used for this and two computers that we can borrow. While the completion of the project is heavily reliant on others' work, I am able to complete my tasks on my own and with the guidance of my team lead and mentor. These tasks should take a month or two to complete which means we will be able to hopefully meet our project goal.

Project Schedule:

As previously mentioned, we are aiming to have this project done in the middle of April. By the middle of March, we want to have completed the in-memory DB and pub-sub (Kafka) integration and the HSML API with in-memory. Between March and April my group will also be working on developing the physics simulations and the use case integration testing with pub-sub messaging using HSML. As we move towards the end of the project, the entire group will be working on tying everything together and hopefully we can finish this project on time! These timings can change as we move forward, but the ultimate goal stays the same.

References:

I have spoken with my team lead in the lab about the best way to move forward with the project and she suggested familiarizing myself with all of the GitHub files that relate to our part of the project. I have looked over the files explaining the purpose of the HSML implementation and continue to learn about the API usage. I have also used the computers in the lab to familiarize myself with Unity, Unreal, and NVIDIA's Omniverse. I looked over the virtual environment created for this project which was absolutely fascinating. My mentor has also suggested that we record all of our work and create weekly powerpoints of what we have worked on. Even if we haven't completed our task successfully, it's important to share what we have worked on because maybe someone can help if we present the errors we run into. In all, I have all of the resources and support that I need to complete my tasks successfully!