**Digital Twins Interoperability with the Hyperspace Modeling Language (HSML)**

Overview

The goal of this project is to achieve interoperability, the ability to have communication between a diverse set of systems, between various metaverse platforms (e.g. Omniverse, Unity, and Unreal). We will accomplish this by utilizing the **Hyperspace Modeling Language (HSML)**, a language that can be parsed and interpreted by any metaverse platform (Barrio, 2025). For this project, I am primarily focused on designing, improving, and debugging the server-side communication between the central data server (Kafka server) and the scripts that translate the physics data to the standardized HSML language.

Approach

In the following weeks, I’m interested in implementing, verifying, and debugging the lab environment. Currently, I have been provided independent Python scripts that translate the metaverse-specific data to HSML, but I’m interested in a tangible implementation to determine what components need improvement. I believe that there is a current implementation at the lab in one of the computers, so I’m aiming to obtain access and see how the current implementation is set-up. I’m specifically concerned about the efficiency of the current system; the Python scripts will be running in real-time, which may cause performance issues. I’m looking forward to working with my team lead, Alicia, to see if design improvements can be made.

Progress

In the past few weeks, I’ve worked on updating the Python scripts to correctly translate the updated HSML format. Updating the scripts was necessary for my team lead to test them in the lab environment. My goals for the next month are to identify pitfalls in the current design and debug any errors in the implementation. I will work closely with my team lead, Alicia, to determine the project’s needs.

References

Barrio, A. (2025). *HSML Schema Documentation*.

Resources

[NVIDIA Omniverse Kit Overview](https://docs.omniverse.nvidia.com/kit/docs/kit-manual/latest/guide/kit_overview.html).