



Thesis Opportunities at Pitch



Background - High Level Architecture (HLA)

High Level Architecture (HLA) is a standard for distributed simulation. It is used when building a simulation for a larger exercise by combining (federating) several simulations together. The standard was developed in the 90s under the leadership of the US Department of Defense and was later transitioned to become an open international IEEE standard. Today HLA is used in a number of domains including defense, security, and civilian applications.

Low latency video streaming over HLA

Pitch has developed a tool, Pitch Media Streamer, that can collect a video stream (often created by a software tool such as ffmpeg), then transmit it over HLA and emit it somewhere else on the network. This is used, for example, to record screens during a training session. This thesis would investigate how the current tool chain can be improved to reduce the latency of the video stream. The thesis should not only investigate the software tool chain, but also look at possible hardware solutions (such as from Matrox) for the video encoding.

Populating a distributed simulation with pattern-of-life models

When running a distributed simulation, it would be useful to have a realistic simulation of ships, aircrafts and traffic moving around, and display realistic behavior, in the simulated world. This thesis would look at how AI and Machine learning techniques could be used to create such models, specifically generating realistic road traffic. Input data could be Google Maps, Open Street Map or other sources of open data. The models should use HLA to communicate with other simulators.

Distributed After Action Review

With distributed simulators used for training, after action review is often the most important part to make sure the students learn and improve. This thesis would investigate how multiple simulators can be controlled from one central application to support After Action Review. For example, how to make simulators play back data from the correct scenario at the correct time. The controlled applications already have functionality to record and play back their own data. The standard Distributed Debrief Control Architecture should be investigated, and if deemed applicable, a test implementation should be created.

Other topics

If you are interested in Pitch, but didn't find the above ideas matching your profile, please let us know. We have other ideas for a thesis such as a federated flight model, synchronized recording of multiple data sources and more. Contact us at jobs@pitch.se.

Already have an idea for a thesis?

If you have an idea for a thesis we would be happy to discuss it with you. We offer opportunities both for bachelor's and master's thesis. Contact us at jobs@pitch.se.