3D Animator and Game Engine Programmer

The Linguistic and Assistive Technologies Laboratory (LATLab) at RIT is looking for a 3D game engine programmer, familiar with real-time animation, to extend an existing virtual human animation platform. Our lab conducts research on technologies for people who are deaf or hard-of-hearing, including the semi-automatic synthesis of animations of a virtual human performing American Sign Language (ASL).

Our lab uses data from motion-capture recordings of human ASL signers, and we build machine-learning models of human movement patterns. We utilize these models to automate the selection of speed, timing, motion-paths, and other elements of human movement, to speed up the process of producing animation.

We are seeking a programmer to port an existing animation platform atop the Unreal Game engine (UE4). Specifically, the programmer/animator would implement the interface bridging our interactive runtime and the rendering pipeline of the Unreal Engine. This virtual human platform will enable our lab to independently control the movements of our sign language avatar, with freedom to research body motion, while allowing us to take advantage of UE4’s deployment, integration, and performance capabilities.

Our real-time interpreter is already capable of a number of specific capabilities, including face control via MPEG4 Facial Action Parameters, inverse kinematics control of the elbow and shoulder (based on hand location), control of eye-gaze and head position based on directional vectors, interpolation of the animation movements between keyframes using acceleration curves, etc. All these features are symbolically described in a declarative language called EMBRScript; the interpreter for this language is written in pure C++ with a minimal amount of dependencies and currently relies on a deprecated version of the Panda engine (1.7.2) as a rendering backend.

The deliverable would be a platform that can accept as input a script (written in EMBRScript) for a desired performance (containing keyframe poses for the body and a stream of face parameters), with the ability to produce as output an animation of a virtual human rendered in the UE4 engine.

This position would be a full-time co-op or part-time position (open to graduate or undergraduate students), ending June 2016. Compensation would be based on the prior experience and skills.

Required skills:

- Programming experience with the Unreal game engine.
- Programming experience with C++ (STL and Boost template libraries would be a plus).
- Experience controlling and animating virtual human characters in a game engine using bones, blendshapes, and dynamic normal maps to control hand, arm, body, head, and face movements.
- Good communication skills, with the ability to obtain requirements for the project and convey progress on a regular basis using Email and video-conferencing (Skype).

Preferred skills:

- Prior familiarity with MPEG4 Facial Action Parameters.
- Prior familiarity with American Sign Language.
- Prior familiarity with inverse kinematics control of virtual humans.
- Experience using Blender.

Interested candidates should submit a resume to matt.huenerfauth@rit.edu.

LATLab at RIT: http://latlab.ist.rit.edu