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Vincent Argentina

University of Alabama in Huntsville

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Visualizations for Cartilage Restoration Method

Vinny Argentina, Assistant Professor, Art, Art History & Design
162 Wilson Hall, 256.824.6521, vinny.argentina@uah.edu
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The goal of this project is to create visualizations, including graphics and animations, to facilitate public outreach for ongoing medical research. The selected student will work with RECU mentor, Vinny Argentina, to highlight the salient features of novel medical therapy research on cartilage restorative methods using low-intensity continuous-ultrasound (LIUS) being done by P.I. Anu Subramanian (Chemical Engineering, UAH). LIUS is a relatively non-invasive method being developed to promote and restore joint stability through cartilage restoration. Final products developed by the RCEU team will illuminate the technical details of the LIUS research and make them more accessible to broader audiences.

The RCEU team will seek to broadly understand the LIUS research through collaboration and periodic meetings with Dr. Subramanian. The team will propose solutions that help visually communicate the process and results through animations or interactive media. It is likely that 2 to 3 such visualization proposals will be needed before starting asset work on the project. Dr. Subramanian provided the illustrations below as a starting point for the work to be done.

End Result: Patient specific optimal ultrasound regimen.
Once the visualization proposal has been approved by Dr. Subramanian, the RCEU team will create and animate all needed graphics to facilitate high quality scientific visualizations for the project.

The student member of the team will contribute ideas for visualizations, 2D and 3D assets, animations, motion graphics, sound design, editing, and possibly programming work (if needed for an interactive visualization and the student is inclined to work on coding). We don’t yet know the direction of the visualizations that will be needed for the project, but it’s highly likely that much of the work to be done will be 3D and highly technical in nature.

This is an outstanding opportunity for a student to get real-world experience collaborating with subject matter experts and creating scientific visualizations. The selected student will see a project through from concept to completion and have a high quality project to add to their animation portfolio by the end of the RCEU period. The student will see improvement in understanding of software tools and techniques and the artistic application of them, as well as improvement of soft skills such as critical thinking, communication and collaboration.

Student applicants are required to have completed ARS 220 Animation: Introduction and at least one 300 level animation skill development course (ARS 32X) before the RCEU project begins. Students with at least one 400 level animation production course (ARS 41X or 42X) are preferred.

Faculty mentor will be actively working on the project and will collaborate with the selected student on all phases of the project. The student and faculty mentor will be the RCEU Team. The selected student will work in Wilson Hall with faculty mentor and will meet regularly (likely ranging from several times a day, to several times a week) about the project. New software tools and techniques and advanced troubleshooting needed for the project will be demonstrated by faculty mentor.
2016 - RCEU_Animation_Argentina
Jess Bailer worked on storyboarding, character design, character modeling, prop modeling, texturing, shading, facial blend shapes, and motion graphics for the short film we worked on as part of RCEU 2016. She learned new 2D and 3D software tools and techniques and improved existing skills and aesthetic sensibilities though work on the project. She also created some strong work for her portfolio on the project. The experience from the RCEU project helped her land an internship in the fall of 2017 that will become a full-time job when Jess graduates in December.

2017 - RCEU_Animation&Theatre_Argentina
Tanya Chavez worked on script analysis, environment/set design, modeling, texturing, shading, lighting, user interface design, and scene setup in Unreal Engine. She learned new, and enhanced existing skills in both 2D and 3D art production. She created a high-quality 3D portfolio piece during the project and the RCEU experience was the turning point in the quality of her art production. Working full time on animation production and needing to meet specific quality standards clearly makes a tremendous difference for students. She consistently made quality models from this point forward and was able to land a full-time job at graduation because of the quality of her work.