Erik Coltey

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EDUCATION

Florida International University, Miami, FL **Expected Graduation: April 2021**
B.S. in Computer Engineering - Honors College, 3.85/4.0 GPA
Ph.D. in Computer Science - Accepted **Expected Start Date: June 2021**

SKILLS

Tools: Photoshop, UE4, Unity, Blender, Zbrush, Substance Painter, Microsoft Office, CMake, Microsoft Visual Studio/Code, XCode, Android Studio, MySQL, Git/GitHub, HTML/CSS, React Native, Django, Flask, Pytorch, Agile/Scrum, OpenGL.
Programming Languages: Proficient in: C/C++, C#. Familiar with: Python, Java, JavaScript, PHP, Objective-C, VHDL.
Languages: Fully trilingual in Spanish, French and English.

EXPERIENCE

FIU DMIS Lab | Undergraduate Research Assistant **September 2019 - Present**

- Implemented experiments on predicting student understanding using biometrics for multiple choice assessments in AR.
- Built a framework for loading learning content in VR using a hypergraph of 3D scenes defined as JSON files in Unity.
- Helping implement an AI model to partition layers of existing neural networks on different edge devices such as FPGAs, GPUs, and CPUs using PyTorch with Graph Convolutional Layers and Sequence to Sequence models.
- Leading an agile web/app team to create a platform for curating supplies during times of need such as COVID-19 to small businesses using React Native and Django, with potential users including the Miami Beach Chamber of Commerce.

NASA Armstrong | Software Engineering Pathways Intern **January 2019 - August 2019**

- Designed a C++ pipeline for visualizing very large (30 million+ points) Point Clouds, with features including tile-based streaming and Octree level of detail support, to enable long-distance spatial mapping on the Microsoft HoloLens.
- Created a C++ back-end for sending/receiving NMEA GPS/Heading data with UDP, with iPhone/Android apps to send it, and a module for the HoloLens to receive it.
- Built a gesture and voice command based mission planning system for a PC autonomous drone simulator by an award-winning team at NASA Langley, along with remaking the entire simulator GUI for use with the HoloLens.

Southeastern Universities Research Association (SURA) | Software Engineering Consultant **October 2018 - January 2019**

- Added lunar surface 3D scenes in the Unreal Engine based on a pipeline using Lunar Reconnaissance Orbiter (LRO) data.
- Created C++/Blueprint simulations and 3D models/textures of geological research tools (X-Ray Fluorescence Spectrometer, LIDAR scanner), and vehicles such as the Lunar Roving Vehicle (LRV).
- Created a system for classifying different lunar/martian rocks based on common geological properties in C++ with JSON.

NASA Goddard | Software Engineering Intern **June 2018 - August 2018**

- Created a pipeline for batch converting CAD assets into optimized 3D models for AR/VR with Blender's Python API.
- Created a VR visualization of the HI-SEAS habitat in Hawai'i for potential astronaut crew training by 3D modelling/texturing the full environment, along with implementing most of the functionality using UE4 Blueprints.

PERSONAL PROJECTS

CEngine - https://github.com/colteye/CEngine **August 2020 - Present**

- Currently building a real-time 3D rendering engine with physically based rendering (PBR) support using C++, OpenGL,and the OpenGL math library (GLM), with potential applications for games and simulations.

Raya - https://github.com/colteye/Raya **June 2020 - Present**

- Currently building a multithreaded ray-trace renderer based on UCSD's CSE 168 course content using C++ and GLM.

FPGA Synthesizer - https://github.com/colteye/FPGA_Synthesizer **August 2020**

- Built VHDL software for the BASYS3 FPGA along with associated circuitry to create a fully polyphonic single octave synthesizer with volume control.

PUBLICATIONS

Yudong Tao, **Erik Coltey**, Tianyi Wang, Miguel Alonso Jr., Mei-Ling Shyu, Shu-Ching Chen, Hadi Alhaffar, Albert Elias, Biayna Bogosian, Shahin Vassigh, "Confidence Estimation Using Machine Learning in Immersive Learning Environments," IEEE 3rd International Conference on Multimedia Information Processing and Retrieval, August 6-8, 2020, Shenzhen, Guangdong, China.

AWARDS

NASA Goddard Swoosh Award in CS/IT **August 2018**
Forbes 30 Under 30 Scholar **August 2018**
Team Fortress 2: Saxxy Awards - Best Overall **March 2018**
Dean's List **December 2017 - Present**
FIU Ambassador Scholar **August 2017 - Present**
Florida Bright Futures Scholar **August 2017 - Present**