

Peter Whidden

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Education

UNIVERSITY OF WASHINGTON - Seattle
Major - Astrophysics
Graduation Expected 2018

Professional Experience

DIRAC Institute

GPU Computing Research - Spring 2017-Present
Designing and implementing algorithms to search for Kuiper Belt Minor Planets, Asteroids and Comets. Implemented a custom GPU accelerated image processing pipeline that has analyzed hundreds of gigabytes of telescope data. Use of CUDA achieved a 100x speedup over a previous version. Planned publication of results in early 2018.

Google, CERN

Open Source Developer - Summer 2016
Through the Summer of Code program, Google funded my work on interactive features for CERN's JSRoot data science framework. Used to WebGL and three.js to visualize particle accelerator models and data. Increased rendering performance by 5x, and built an interface for viewing complex 3D models with millions of components.

N-BODY Shop

Particle Simulation Optimization - Spring 2016
Optimized and tested code on University of Texas' Stampede Supercomputer. Worked on the CHANGA N-body and fluid dynamics simulation software. Vectorized gravitational force code to take advantage of 512-bit SIMD instructions on the Intel Xeon Phi MIC processor.

Three.js - Open Source 3D WebGL Library

Open Source Contributor - 2015-2016
Expanded a feature in three.js (a 3D graphics library used by millions) by adding to shaders and the WebGLRenderer allowing a user to view cross sections of 3D models. Code is now merged into official release.

Leadership

UW Computer Graphics CoFounder & President

<http://uwc.graphics>
A student organization that hosts weekly meetups to teach and discuss topics in graphics programming. We create weekly workshops teaching three.js, shaders and more in a format accessible to a group of students with a wide range of programming experience. Introduced dozens of students to GPU programming via shaders and graphics APIs.

Personal Projects

GPU Ray Traced Renderer and Minimal Game Engine

C++, OpenGL, glm, glfw - Fall 2016
A minimal game engine that is capable of rendering images generated by tracing non-linear rays in real-time. Allows the player to create 3D portals that bend and transport light like a black hole. Accomplished by implementing techniques used in the production of the film "Interstellar".

Barnes-Hut Particle Simulation and Renderer

C++ - Winter 2016
Simulates the gravitational interactions of up to millions of particles using spatial partitioning and the Barnes-Hut algorithm. Includes a renderer which outputs the simulation into an animation.

VR Solar System Explorer

C#, Unity, SteamVR, Vive - Fall 2016
Built a to-scale version of the solar system in Unity using NASA texture data. Used Vive controllers to implement "Iron man" style thruster controls from each hand for locomotion.

WebVR Viewer for TIPSy Simulation Data

Javascript, three.js, WebVRBoilerplate: Spring 2016
Allows for viewing and analysis of cosmological (galaxies and stars) simulations in the TIPSy data format in a web browser, and in VR with Cardboard, Oculus, or Vive.

WebVR Experimental SoundCloud Interface

Javascript, three.js, WebVRBoilerplate, SoundCloud API: Fall 2016
An experimental interface that allows the user to specify any soundcloud artist, and walk/fly through a generated virtual discography. Songs are placed throughout 3D space, and the UI is automatically colored based on track album artwork.

Skills

Languages: C++, Python, Javascript, C, Java, C#, Haskell
Experience: CUDA, OpenCL, OpenGL/WebGL, OpenMP, OpenMPI, OpenCV, pybind11, numpy, pandas, sci-kit learn, image processing, computer vision, machine learning, deep learning, CNNs, keras, pytorch, tensorflow, three.js, node.js, socket.io
Media Software: Solidworks, Unity, Ableton Live, Final Cut Pro, Adobe Premiere, Photoshop/Gimp

Interests

Mountain Climbing, Surfing, Music Production, Cinematography, Skateboarding, ShaderToy