

GRAPHICS SOFTWARE ENGINEER

Summary

Currently have 8 years of experience in a variety of domains encompassing application layer, user mode drivers and compilers.

Highlights

C, C++, C#, Python API: DirectX, OpenGL, Django (Beginner) Development Tools: Visual Studio, WinDbg, DirectX Pix

Experience

Graphics Software Engineer 12/2012 to Current Apple Inc. Tulsa , OK

- Currently working in the graphics compiler team to develop a unified shader compiler for graphics and GPGPU api's across all desktop and mobile operating systems.
- Was a key member of the new graphics compiler frontend and midend.
- Involved since the inception to the delivery of the project from end to end.
- Architected and implemented the Apple Metal Frontend and worked closely with Apple engineers to make it functional.
- Implemented new frameworks for reading metadata coming from different api's.
- Designed and implemented the DirectX 10, 11 frontend including the parser and code generator, making it modular to be extendible for future api's using design patterns.
- Added infrastructure to be able to detect memory leaks.
- Designed and Implemented the Geometry Shader and Compute Shader units of the compiler.
- Prototyped memory allocators for benchmarking compile time performance improvements.
- Implemented various optimizations for the compiler to improve performance leading to multiple patents.
- Debugged various games, WHQL, Metal unit tests, OCL Khronos tests for both performance and functional issues.
- Managed the team for a period of 3 months when manager was on sabbatical.
- Mentored multiple interns and managed contractors.
- Was responsible for creating and productizing multiple tools including a first of its kind shader debugger (C#, WPF), a dashboard for measuring statistics and performance data (Django) and tools for managing machine pools (C#).

Sr. Driver Engineer 01/2011 to 12/2012 Advanced Micro Devices AMD City , STATE

- Worked in the DirectX driver team to develop driver functionality for all new asics including discrete and fusion products.
- Led the Bring up for Kabini Fusion APU, which got completed in a record 3.5 days with an aggressive schedule of booting Win 7 & Win 8 and running 3D Mark 11.
- Led the feature, development and debug support for Kabini Fusion APU.
- Involved in meeting memory requirements for driver for Windows 8 Worked on various features for improving performance for Southern Islands asic family.
- Developed shader binary compression algorithms to reduce memory footprint.
- Got driver feature ready for the upcoming asic products with emulators.
- Have been a major stakeholder for a shared component, used across kernel mode driver, Apple OpenGL driver and linux platform.

Sr. Graphics Engineer 10/2007 to 12/2010 Geodigm Corporation City , STATE

- Worked in a R&D environment to design and develop products as well as enhance and rearchitect the core engine to improve performance and functionality.
- Re-architected the graphics pipeline for the emodelÂ© engine to achieve a significant performance improvement for heavy meshes to improve rendering and user interaction using C / C++ and OpenGL.
- Implemented Core Engine enhancements in the Geometry based algorithms using C / C++.
- Did UI design based on Qt and C++ for the engine.
- Worked on embedding Python and Tcl into the core engine to enable embedded scripting.
- Worked on geometric algorithms for enhancing the crown building algorithms for auto-building of various parts of a tooth.
- Was involved in development of a metric database system using Django for the production tracking of the ICON digital assembly line.
- Conceptualized, developed and prototyped the Metal Occlusal product for the ICON dental production system and eventually got it to production.
- Designed and architected the emodel 9.0 software for Orthodontists.
- Designed and implemented the AutoGrid application using C# which integrates the ICON system with the Rapid Prototyping system.

Accomplishments

- MS: Graphics & Virtual Reality, THESIS: Surface Reconstruction from Unorganized Point Cloud Data using Incremental Delaunay Triangulation 2001-2005 NIT Hamirpur, HP, India B-Tech Personal Projects Designed a cloth simulation using OpenGL Compute Shader support.
- Rendered OpenStreetMaps and used djikstra for optimal path computation with python and Vispy.
- Rendering of OpenStreetMaps using opengl on android.
- Currently learning functional programming using Scala by implementing simple machine learning algorithms to design apis.
- <https://github.com/ssarangi/scalaLearn> Currently working on a dynamic language jit using python.
- <http://ssarangi.github.io/spiderjit/>.

Education

2007 State University of New York City , US

Personal Information

Facilitating dynamic runtime transformation of graphics processing commands for improved graphics performance at computing devices. (Filed: 2015) Apparatus and method for Efficient Prefix Sum Operation (Filed: 2015) Hardware Instruction Set to replace a plurality of atomic operations with a single Atomic Operation (Filed: 2014)

Additional Information

- Patents Facilitating dynamic runtime transformation of graphics processing commands for improved graphics performance at computing devices. (Filed: 2015) Apparatus and method for Efficient Prefix Sum Operation (Filed: 2015) Hardware Instruction Set to replace a plurality of atomic operations with a single Atomic Operation (Filed: 2014)

Skills

3D, API, Apple, asic, benchmarking, C, C++, database, delivery, drivers, features, functional, Graphics, linux, managing, Mark, memory, C#, Windows 8, Win 7, Win 8, OpenGL, operating systems, Prototyping, Python, reading, rendering, scripting, statistics, Tcl, UI design, Visual Studio