

Principal Software Engineer Principal Software Engineer Principal Software Engineer Scarborough, ME Lead/Principal/Senior Software engineer with extensive application and architecture design and development in all aspects of the full product life cycle for diverse products/applications including 3D graphics applications, military simulations, graphics drivers, radar, games, and web applications among others. Particular strength in multi-threaded algorithm development; enjoy user support, system test bed development, education, and user interface. Extensive background in mathematics, especially numerical, complexity, and geometric algorithms as a specialty. Specializations

Software Development: C++, C, Java, Python, C#/.NET, Go Javascript, AngularJS, KnockoutJS GUI with .NET/Win Forms, FLTK, Qt, Swing, HTML/Web Frameworks RESTAPI, Web Sockets, Nancy Server, Pyramid, JSON, XML, JNI, Applets Mongo, Cassandra, Couchbase, Redis SQL, MySQL, Postgres, ODBC, JDBC Eclipse, Visual Studio, Maven, Make, Ant Git, Subversion, CVS, Clearcase, Perforce, etc. Object Oriented Design Methodologies posix, STL, Boost, Linux and Windows System Level Programs Advanced Numerical Algorithms, Matlab UML, Doxygen Real Time, Parallel Algorithm Design Graphics Systems and Computational Geometry: Games Development Graphics Drivers; Mesa, ATI, Wddm Digital Signal and Image Processing 3D Studio, Renderman, Kadara, Maya, Softimage 3D Modeling and Parametric Surfaces OpenGL/GLSL/Vulkan, Direct3D/DirectX/HLSL Babylon, FBX, Roblox, glTF Motion Capture and Motion Systems Rendering Systems Systems: System Administration Python, Perl, Shell Programming TCP/IP, Sockets, Networking/Distributed Systems Linux/Unix, Windows, Mac OS X Systems Design Authorized to work in the US for any employer Work Experience Principal Software Engineer Here Engineering - Brunswick, ME June 2018 to Present I worked as a backend developer creating interfaces for embedded systems on turbines and industrial products. The development was in C++, used ZeroMQ, and a React frontend. Principal Software Engineer Here Engineering - Brunswick, ME June 2018 to Present I am developing in c++ backend software for interfacing with industrial devices such as large turbines. We use ZeroMQ for the messaging system, SQLite for the database, and React for the frontend framework. Senior Software Engineer Canon - Cambridge, MA October 2016 to June 2018 Front End C# development and interface to backend in C++ using

MSVS 2015. This is relatively "ground floor" development with design, specification creating, and implementation. I have assisted in design of and implemented the user interface for the MMOCT project in C#. I have created the ability for the interface to interchange with the back end using standard sockets and memory mapped files. This work includes both implementation in C# and a temporary test back end in C# and in C++. I developed a spline interpolation algorithm in C# with the Spline Interpolation Wiki to interpolate lumen edges of the OCT images in the GUI. I also created the ability to fully edit the spline interpolations. I worked on the 3D rendering of vessels for the longitudinal vessel view for the MMOCT project using both Direct 3D and OpenGL, and using two algorithms, a faster direct triangle rendering made possible from polar coordinate data, and volume rendering of the slices.

Lead Full Stack Developer Outerlink - Wakefield, MA January 2015 to August 2016 Back End C# development and some front end development, interfacing with Postgres database, Redis data store, and a KnockoutJS front facing web applications. Interfaces communication handled with web sockets. I have implemented the security/authentication portion of the back end system in C#. I designed and implemented a test suite UI for testing the backend with a front end in KnockoutJS. I am overseeing the day-to-day activities of the backend development with one additional developer. I implemented in C# using RESTAPI/Nancy Server and web sockets, an entire API interface for the helicopter tracking system.

Short Contract Change My Path - San Francisco, CA April 2016 to June 2016 Senior Development Consultant, Games Development for Career Path Improvement I setup a backend installation including the automatic installation with make of third party tools such as Neo 4J, Titan, Redis, Cloud 66, etc.. I analyzed 3D development tools including Babylon, FBX, glTF, Collada, Roblox, etc. for their game engine.

Short Contract Elucid Bioimaging, Inc - Wenham, MA January 2016 to March 2016 Senior Software Engineer, Biomedical Imaging Product I worked on automation of their installation using various third party tools for installation which included vtk, Qt, python, g++, etc.. I wrote python code for their interface to their database.

Senior Python and Web UI Interface Developer Cincinnati Bell Technology Solutions - Cincinnati, OH July 2014 to January 2015 Front end, web-based, user interface development with AngularJS coupled with middle layer development with Python, Pyramid,

and interfacing with a Couchbase database backend. Security product. I designed and implemented an AngularJS web interfacing reporting tool within the application's portal. This tool retrieves data from the Couchbase no-sql database via a Pyramid interface to Python, and then presents the data in tabular and chart forms. I designed and implemented a Threat Assessment Center Screen layout for the Web Portal in AngularJS. I designed and created a python interface for the middle layer of the application for generating reports regarding system alerts. Senior Software Engineer SilverSky/Perimeter Networks - Boston, MA July 2013 to July 2014 DLP/TAP e-mail security software. Development in C, Python using Mongo database and Oracle database, PHP and Javascript front end interface using RESTFUL. Tools include; Git repository, Jira bug tracking, Clearcase, etc. . I developed for the Mongo API between C backend and PHP frontend using python. This includes adding the interface functionality for the full TAP process, e-mail quarantine based on suspicion algorithms. This includes JSON data passing, Mongo database collections and grid file systems. The PHP/ python interface is the RESTFUL interface. I have developed backend functionality in C for the e-mail security product including TLS preferred network e-mail handling, some proprietary information scoring handling, system avoidance of looping message quarantining, personal information redaction, etc. I modified substantially the quarantine notification PHP e-mail message system. I wrote several test bed scripts for use in testing the system's larger components including, a general mongo gridfs testing of the python interface for handling messages and their information, and a shell script for quick testing of PollyC formatted language internal interface for the system. Senior Software Graphics Consultant Oxford International - Wakefield, MA August 2013 to March 2014 This was Side-Work. Visual Studio 2010 C++ OpenGL development for Lantos Technologies. . I developed the ability to perform specific functions on an OpenGL/GLSL rendered ear canal product in OpenGL using Microsoft Visual C++ in MSVS 2010 with a Qt interface. The implementation involved working with frames commonly beyond the OpenGL context inside of Qt as well as inside of Qt. I helped modify an alternate version of this system that used basic Windows frames, and glut functionality. This included extensive work with the rendering pipeline and material selection process. I wrote a specific algorithm for computing

plane cross sections of a given ear canal, and displaying these slices along with the 3D object.

Software Consultant to Raytheon Fisheye Software - Maynard, MA October 2012 to June 2013 at MDC in Woburn, MA - Clearance Level, Secret Ada and C Radar development. . I am designing and implementing gears build process for the mpx radar system. I worked on bugs in Ada and C for the cx radar system.

Software Developer in C++ P3 ProSwing/Virtual Sports, Inc - Bethel, ME November 2011 to January 2013 Internal GUI interface in Windows Visual Studio 10, and Visual C++. This consisted of fixing parts of the GUI interface for a golf simulator. The simulation in 3D was produced in D3D/DirectX 9. Part time Contract.

Principal Software Developer P3 ProSwing/Virtual Sports, Inc - Westford, MA November 2011 to October 2012 3D specialist for NxTop Product Development. . I benchmarked VirtualBox for 3D graphics for use in conjunction with NxTop. I wrote 3D tests for benchmarking in OpenGL and Direct 3D. Some use shaders languages and some do not. I worked on resolving bugs in the VirtualBox Windows build in order to be able to test the Wine interface. I worked on the WDDM driver for Windows 8 using Visual Studio 11.

Dynamic Computing Services Contract Slolam and Nike - Portland, OR December 2011 to April 2012 Graphics 3D Visulisation Application Engineer I translated a D3D application into OpenGL including 3D imaging, GLUT, and basic socket communication as a server with client test application. This was written in gnu C/C++ for cross system use. The application is written. I am just clarifying the desired 3D imaging technique needed, and the project will be complete. Part time contract.

Black Diamond Contract Innovative Solutions - Malvern, PA January 2012 to March 2012 Graphics Driver Development With Mesa and ATI I modified the Mesa R600/R700 Driver to carry out regular antialiasing via GLSL. This included point, line, and polygon anti-aliasing. This used gnu C, standard debugging, and testing. Unit test programs were also generated. Part time contract. .

GCR Contract AMD - Foxborough, MA May 2011 to October 2011 Senior Software Developer Fixed bugs in OpenGL Drivers generated originally from ATI, and now owned by AMD. These repairs involved both kernel and client-side debugging. The unit tests in need of repair used the GLSL language. . I fixed bugs for the ATI R500, R600, and R800 ATI drivers for the MacOS, both Snow Leopard and Lion. This involved both client and kernel side debugging. I wrote simple shaders for testing

purposes to determine where bugs were being generated from. SYSTEM PROS. Contract MAK technologies - Cambridge, MA November 2010 to April 2011 Senior Software Developer Design, implementation/development, and testing in C++ using Visual Studio 2008, and Qt Gui, including OpenGL, interface for military simulation software. . I implemented an interface for the VrForces application startup. This was initially installed as part of the Gui startup, and then was modified to a command line setup. I wrote Gui and backend functionality to save and load line-of-site diagrams onto the terrain for both general and entity locations. KFORCE Contract IBM - Cambridge, MA September 2010 to November 2010 Senior Python Programmer and Developer Design, implementation/development, and testing in Python 2.6, of Websphere application backend with Cassandra database. I contributed Python code and pyunit tests for this code for the back end of a Websphere IBM Centennial project for advanced web search. I have written JSON related objects and associated Python code. The back end interfaces with a Java front end, and a Cassandra database. Senior Software Consultant FIDELITY TECHNOLOGIES, INC - Reading, PA October 2009 to September 2010 Design, implementation/development, and testing in Visual Studio 2008, C++/C#, .NET, Database, OpenGL for Air Force call for fire and call for air support simulators/trainers. I designed and fully developed, and integrated an authoring tool for all scenarios run in the simulator/trainer. This development included the graphical user interface and all backend functionality including database and networked systems communication. I implemented and developed the automated startup/shutdown procedures for this simulator/trainer including multiple networked systems and applications including the Windows and Unix systems. I designed and developed modestly advanced algorithms for ballistics including free-falling, parachute free-falling, self-propelled, and guided munitions. These algorithms included some advanced three-dimensional movement with matrix algebra for the guided munitions. I developed integrated interface for communication of the simulator/trainer with the Raytheon HLA system for communications for weather and other effects for the images in Fidelities Image Generator systems. This included an OpenGL interface as well. I wrote code for XML reading and writing of files of many forms for the system scenarios. I wrote plane route calculations for bombing runs/missions.

I designed the primary database for the JTC-TRS Simulator and trainer. Senior Software Engineer NUANCE COMMUNICATIONS, INC - Burlington, MA 2007 to September 2009 Implementation, development, testing, and customer support in C++, Python, and Java for voice recognition technology. Developed in Java, C++, COM, and STL for Dictaphone enterprise product; supported customers; Integrated modules in C++ for Dragon Naturally Speaking. Worked on development of server-side implementation of multiple-pass word recognition. Created tests for mobile phone, voice mail, and voice search algorithms, compared to research results and modified as needed in Python. Senior Software Developer/Technical Consultant GENERAL DYNAMICS, INC - Lexington, MA 2003 to 2007 Consultant on-site at Lincoln Laboratory, Lexington, MA. Clearance level - Secret. Scientific, multi-threaded, POSIX algorithm development in C++ for radar technology. Assisted in design of multi-language OASIS radar architecture. Worked on C++ implementation. Initial implementation in Java. Wrote Java radar cluster algorithms with plotting carried out using JfreeChart/Java 2D/Java Swing tools. Designed and implemented an original radar track correlation routine, written in Java, and interfacing with C++ via JNI. Designed the multiple language discrimination architecture for a Java plug-and-play architecture for easy comparison of discrimination algorithms. Interface to Java from C/C++ and Matlab using JNI and Matlab compiler.

I worked on the OpenGL ballistic intercept simulation on IRIX for the Air Force. Created and edited the team's software coding standards. Participated in the development of a real-time, embedded radar software application. Involving detailed use of multithreads and parallel processing across 64 CPUs; interface with a non-real-time component. This system was heavily multi-threaded with POSIX and non-POSIX threads, OpenGL, FLTK. Translated and reworked more detailed data association and detection algorithms from Matlab 6.5 to C++ (gnu and Intel compilers); real-time data integration/ initial detection used standard Kahlman filter processing; plotting routines used Matlab 6.5 interfacing with Python, and C++. Wrote benchmark tests to test the effectiveness of numeric parallel algorithms for both the IRIX and SUSE Linux operating systems running on SGI Origin and Altix hardware. Wrote and tested an entire numerical library to match numerous Matlab calls in C++. This library used the STL. Wrote a code line counting script in Python for counting

lines of code in C++, C, Matlab, python. This application is being used by various team members.

Senior Software Developer SILICON GRAPHICS, INC - Hudson, MA 2001 to 2003 Scientific, multi-threaded/POSIX algorithm development in C++ and Python. Also SGI graphical development.

On-site at the following locations Consultant on-site at RAYTHEON, INC., Sudbury, MA

Participated in the development of a real-time, embedded early warning radar software application. Work involved detailed use of multithreads and parallel processing across 96 CPUs (final result was scheduled to be run with 128 CPUs). Designed several synchronization mechanisms for application. Assisted with compiler optimizations (Origin 3000, Windows NT, SGI/IRIX C++, POSIX, Python, Matlab). Designed all but the interface of a generic queue module for real-time data handling of large sets of data. Designed machine check handler to handle system exceptions and floating-point exceptions as a subgroup. Technical Consultant to RAYTHEON, INC., Bedford, MA

Troubleshoot radar 3D graphics output in interface with Oxygen 2 systems. Analyzed and fixed bugs with assistance of hardware support (Oxygen 2, SGI C++, Python, OpenGL). Technical Consultant to SCI-QUEST, Huntsville, AL Created and designed story board content with customer for three 3D reality engine programs with interactive portions. Programs included: space exploration, human anatomy, ecology and Earth biomes. Programs required extensive planetary and terrain modeling along with other types of 3D modeling. Designed an orbit calculator in C++ for use in the space program. (Silicon Graphics O2 and Reality Engines, PC's witLinux, OpenGL, Maya, SGI C++.)

Senior Software Engineer BMC SOFTWARE, INC - Waltham, MA 2001 to 2001 Enterprise Java development for web portal application. Designed and implemented web based applets and Servlets for a database selection system primarily for use in monitoring network traffic tools. Set up and installed initial portal software using Jetspeed from Jakarta. Participated in the analysis of capabilities of third party portal tools. Designed the entire portal GUI interface for the latest portal combined product.

Senior Scientific Software Developer SYNAPIX, INC - Lowell, MA 1999 to 2001 Scientific algorithm development in C++, Python, and Java. Designed and implemented a 3D surface generation module from 2D extracted depth data. The algorithm generated a single scene extracted from 2D film footage using proprietary techniques (Patent Pending). The interface was

OpenGL driven on Irix. Translated Python/C++ interface for vision system into Synapix's main product build. Wrote an entire geometry library for efficient mesh generation and editing capabilities. Wrote error checking routines in JAVA/C++ interface. Software Developer UNICAM SOFTWARE, INC - Portsmouth, NH 1998 to 1999 C++ interface, database client-side development.

Created multiple features and maintained reporting tool for Unicam's Quality Software Suite for use in assembly line monitoring. (Client-side application that accesses various standard databases through an ODBC server, using OWL and Borland C++ 5.02.) Designed from the ground up a real-time line monitoring interface to monitor several line testing stations. This application uses MFC, TCP/IP, RS232, and is designed in VC++ 5.0. Software Developer POLHEMUS, INC - Colchester, VT 1997 to 1998 C++ interface, algorithms, and driver development for sensor systems. Created interface for Polhemus sensor drivers in Visual C++ for Windows NT and Windows 95. Implemented the driver level network communications. Development included both Direct 3D and OpenGL interface. Worked on motion capture software for production. MERIDIAN PARTNERS, INC., Contracting on-site to MICROSOFT, INC., Redmond, WA Coded interface for performance monitoring tool for Visual Studio 6.0. SILICON REALITY, INC., Federal Way, WA C and C++ Direct3D and MCD OpenGL driver and graphics demo development in Windows NT. TECTRIX SOFTWARE, INC., and LOOKING GLASS TECHNOLOGIES Cambridge, MA C++ development of virtual reality environment games for exercise equipment. 3D programming for interactive DOS and Windows 95 Games in C using OpenGL. Developed motion capture system and virtual motions for various games. PANDORA NETWORK SERVICES, San Francisco, CA; STANFORD UNIVERSITY, CA Systems Administrator TCP/IP Lan networks with The SCO and Solaris Unix systems, and Mac-Centris 650 machines using Dec Ultrix. Academic Experience UNIVERSITY OF SOUTHERN MAINE, Portland, ME Assistant Professor, Mathematics BALL STATE UNIVERSITY, Muncie, IN Assistant Professor, Mathematics Education M.S. in Computer Science in Graphics, Image Processing, 3D Geometric Modeling STANFORD UNIVERSITY - Palo Alto, CA Ph.D. in Mathematics WASHINGTON STATE UNIVERSITY - Pullman, WA B.S. in Mathematics in Mathematics UNIVERSITY OF WASHINGTON - Seattle, WA Skills Java, C, Python, C#, Linux,



Golang, Javascript, NET, Embedded, Software Development

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