

I have 15 years of experience writing software, and I'm familiar with a wide variety of technologies from C++ to computer vision to 3D graphics. I am driven by enthusiasm and passion for my work, and I love collaborating to overcome complex challenges and learning new things to accomplish what has never been done before.

## **employment & project history**

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### **Medico – 3D Medical Scanning, 3D Printer Engineering, CAD Software** Jan 2017-Present

- Working full-time developing industrial-quality software and equipment for 3D scanning patients and 3D printing orthotics and prosthetics
- Wrote C++17 software for capturing 3D data as point clouds, processing it into usable geometry, and allowing user-friendly editing and output to CNC hardware
- Currently leading the development of 3D printer electronics and software, running on Raspberry Pi

Some of my accomplishments:

- Implemented new math and algorithm classes to handle vastly increased amounts of 3D data
- Added optimized algorithms to conveniently automate the processing of scanned objects
- Refactored OpenGL rendering code to improve performance and allow running on tablet devices
- Designed and implemented new user interfaces for complex and specialized workflows

### **OpenGL Project – Real-Time 3D Procedural Generation** 2016

- Uses a mathematical seed to generate a variety of arbitrary complex shapes or near-infinite terrain
- Carefully designed algorithms and GLSL shaders generate and render huge amounts of geometry very efficiently and in real time, allowing the user to navigate and modify the environment

### **BoopShare – File Transfer Application** 2016

- A user-friendly way to enable viewing/downloading PC files on desktop/mobile Web browsers
- C++ was used to implement the client and server, and deployment was automated with Python
- The Web software was built with PHP, JavaScript, and MySQL

Online at [boopshare.com](http://boopshare.com). Detailed development notes at [garysinitsin.com/boopshare](http://garysinitsin.com/boopshare).

### **Everest Water – Consultation and Web Development** 2016

- Technical consultation and e-commerce Web application development

### **TinCanPhone – Open Source VOIP Application** 2015

- Peer-to-peer VOIP written in C++, for Windows and Linux: [github.com/garynull/tincanphone](https://github.com/garynull/tincanphone)

### **Winmar Vancouver – Web Development** 2013

- Developed a PHP application and public-facing website for handling web/e-mail/print marketing

### **On Side Restoration – Internal Software Project** 2008

- Wrote software to automate data-processing tasks by interfacing with a legacy web app over HTTP

### **Contract Work** 2003–2016

- Involving C++, PHP, JavaScript, MySQL, and other Web technology

For more project history and program screenshots, please visit [garysinitsin.com](http://garysinitsin.com).

## skills & knowledge

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### Many programming languages:

C++11/17, C#, C, GLSL, HLSL, PHP, Python, JS, SQL, Shell scripts, and some ASM, Java, and Rust

### 3D math and graphics, including experience with:

Modern and legacy OpenGL, WebGL, Direct3D, vertex and fragment shaders, the GPU pipeline, linear algebra, space partitioning data structures, tessellation of 3D objects and data

### Computer vision:

Algorithms for SLAM, feature extraction, ICP, RANSAC, etc, and familiarity with libraries such as Eigen, OpenCV, and PCL, plus experience with 3D cameras such as Intel RealSense

### Object-oriented programming patterns:

Encapsulation, separation of concerns, loose coupling, polymorphism, etc

### Profiling and optimization, unit testing, debugging, and refactoring:

Visual Studio, GCC, GDB, Catch2, Very Sleepy, etc

### Windows and Linux platforms, plus many API's and libraries:

WinAPI, .NET, POSIX, Boost.Asio, GTK+, OpenGL, Eigen, GLM, GLFW, SDL, CURL, Flask, etc

### Deep understanding of modern computer architecture, including:

CPU instructions, registers, cache, memory addressing, GPU capabilities, OS's, compilers and jitters, and familiarity with x86, AMD64, ARM, and RISC-V architectures

### Embedded systems and electronics:

Raspberry Pi, Arduino, low-level digital logic, I2C/SPI/etc, circuit design and prototyping

### Internet protocols:

TCP/IP, HTTP, Websockets, REST, XML, JSON, and use of OpenSSL and cryptographic algorithms

### Use of version control in a team environment:

Mercurial, Git, SVN, CVS, branching and merging

### Web applications for desktop and mobile using:

PHP, Python, Flask, HTML5, CSS, JavaScript, jQuery, Nginx, Apache, MySQL

### Linux environments and command-line utilities

### Generating tool paths for multi-axis CNC hardware, G-code

### 3D modeling, rigging, and animation, Autodesk Maya/MEL

### User interface design, Unicode and i18n, creating graphics and icons with Adobe Photoshop

## education

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Digital Animation and Effects Diploma, Web Application Development Certificate, CMIT College, 2004

- **Graduated with honors** and received an award for Excellence in Design