

## 3D Software Engineering

**Platforms** Win32/Win16/DOS, Unix/Linux, VMS, AOS, MacOS-X/iPhone  
**Languages** C/C++/Objective-C, Perl, Java, Python/Ruby, VB, FORTRAN, Prolog, APL, Forth  
**Assembly** i80x86/7 cpu/ndp, i8237 dma, i8251 uart, i8253 clock, various video chipsets  
**Graphics** 2D/3D primitives, OpenGL/DirectX, ARB/Cg/GLSL/CUDA, VRML/X3D, CAD, video  
**Networking** UDP/TCP/IP, IPX/SPX, HTTP/FTP, SMTP/POP, client/server, peer-to-peer, others  
**Security** PKI/RSA-PKCS/Diffie-Hellman/DES/MD5, SSL, OpenSSLeay, CryptoAPI  
**Database** MySQL/SQLite/MS-SQL, ODBC/ADO/DBI, ecommerce/authentication transactions  
**WebServer** IIS, Apache/Tomcat/LightTPD (Win32 & Linux), SaaS/SOA/REST/SOAP  
**WebDesign** CGI/ISAPI, HTML/XML/CSS, JavaScript, Flex/Flash/ActionScript, ASP/VBScript, UI design, graphic art, audio, video, 3D animation

### CAREER OVERVIEW

I have been designing/implementing 3D systems since 1973; I spent the 80's developing 3D CAD/GIS systems for McDonnell Douglas, Data General, and others. During the 90's I began developing imaging/video effects plug-ins, VRML apps, and 2D/3D/video services. I am currently focused on providing secure, portable, scalable online 3D/GPGPU video services.

### OPENSOURCE CONTRIBUTIONS

- **Portable OpenGL (POGL)** – a Perl binding written in C for: Windows (NT/XP/Vista), Linux (Fedora/Ubuntu/Gentoo) and MacOS. As primary owner, I've added support for over 60 new OpenGL extensions, including FBO/VBO and ARB-assembly/Cg/GLSL shaders. <http://graphcomp.com/opengl>
- **ImageMagick** – portable image processing library. Added optimized OpenGL APIs.
- **FFmpeg** – portable video processing library. Added a video compositing plug-in that supports alpha channels. <http://graphcomp.com/ffmpeg>

### 2D/3D/VIDEO ACHIEVEMENTS

**1973-1974** – Designed/implemented a **3D modeling/rendering** system w/ hidden-line-removal; supporting 3D fonts. I created all required 3D algorithms. Written in APL on an IBM 360.  
**1975-1980** – Developed **3D Solar Radiation** analysis apps for Cal Poly; tutored grad math students on APL and 3D modeling. Written in APL, Basic and C.  
**1982-Present** – Founded **Graphcomp**, providing 2D/3D/video and networking services.  
**1983-1986** – Developed **3D CAD/GIS** systems for Syscomp/DataGeneral and McDonnell Douglas. Written in C on AOS, Primos and VMS.  
**1987** – Designed/implemented **3D GPU** primitive libs for TMS34010 GPU. Written in assembler.  
**1991** – Created a “faster-than” **GDI** blit'g engine for Win16. Written in C.  
**1994** – Created a “faster-than-IE” dithering engine for blit'g images in a web browser. Written in C++.  
**1996** – Designed/implemented a **commercial 3D web server**. Written in C++ and VRML.  
**1996-1997** – Designed a **3D web authoring** app; won Best New Product at Demo '97. Written in C++.  
**1997** – Designed/implemented a **portable 3D primitives lib** supporting VRML/LODs. Written in Perl.  
**1997** – Designed/implemented a **remote-controlled 3D Avatar system**. Written in Java.  
**1998** – Director of Engineering of **ISDCorp, Cirrus Logics Graphics Division**.  
**1999** – VP of Engineering of **PhotoLoft** – first IPO'd photo-sharing company.  
**2000-2002** – VP of Engineering of **ClubPhoto** – first profitable photo-sharing company.  
**2003** – Designed/implemented a **portable TiVo server** w/ image transforms. Written in Perl.  
**2005** – Designed/implemented a **portable 3D primitives lib for NVSG/D3D/VRML**. Written in Perl.  
**2006** – VP of Engineering of **Fabrik** – first embedded Web2.0 media-sharing appliance.  
**2006** – Invented new **color space model**; optimizes image/video searching/sorting.  
**2007** – Designed/implemented a **portable 3D captchas/authentication** system. Written in Perl.  
**2007** – Released a **portable GPGPU** update for the Perl OpenGL module. Written in C.

MANAGEMENT RESUME: <http://graphcomp.com/bfree/rmf.pdf>