



Kenny Smith

Software Engineer, Chicago area

20+ years of experience developing high-quality, commercial software.
BSE '87, University of Michigan, College of Engineering

Email: kennysmith@me.com

LinkedIn: <http://www.linkedin.com/pub/b/314/353>

References and sample software available on request.

Summary

I am driven to create high-quality, end-user applications. Specific areas of interest include: compelling user interfaces, interactive graphics (2D & 3D), visualization, simulation, distributed systems, and software that makes people say, "Cool!"

Over the years I have developed my own codebase I call Bounce (screenshots here and here). Bounce is a general-purpose, C++ framework for realtime dynamic simulation, data visualization, and whatever else catches my eye. I've used it for browsing voxel datasets, playback of human motion capture data, simulating urban pedestrian settings, creating virtual Lego models, and a Mars rover simulation (with the help of the Open Dynamics Engine and the Bullet Physics SDK). More recently I've created a codebase specifically for iPhone/iPad development, layered on the Box2D physics engine. At the time of writing, I am immersed in WebGL and JavaScript.

Being on a team of smart people solving difficult problems has led to the high points of my career and continues to be my main goal professionally.

Skills

Lots of: Object-oriented design, User-interface design and implementation, Interactive 3D graphics, Client-side, user-facing, front-end apps, Code refactoring, MVC and other yummy design patterns, C++, Objective-C, Cocoa, Cocoa Touch, Qt, STL, Boost, OpenGL, Xcode, Visual Studio, Mac OS X, iOS, MS Windows, SGI Irix (back in the day), Mercurial, GIT, Subversion, and Perforce.

Some: Realtime simulation, design and implementation of distributed systems, RESTful Web services, JavaScript, WebGL, Ruby on Rails, TCP/IP, HTTP, XML, HTML, CSS, SQL, Java, Eclipse, NetBeans, Image processing, and the GNU toolchain.

Employment History

Sr. Software Engineer, [NAVTEQ / Nokia](#), Chicago, IL — August '10 to present

- Creating tools to visualize and improve the quality of NAVTEQ's 3d data products using C++, OpenGL, Qt, JavaScript and WebGL.

Founder and Code Wrangler, [The App Orchard LLC](#), Evanston, IL — February '09 to present

- Founded a micro-company to create engaging applications for the iPhone and iPod Touch. I have a few apps in various stages of development and enough ideas to keep me busy for quite a while.
- iPhone contract programming as part of a team developing a distributed, social marketing platform.
- Co-creator and engineer of [Bon Mot!](#), an original word game for the iPhone and iPod touch (**Figure 1**). Bon Mot is currently for sale in the iTunes App Store.

Sr. Software Engineer, [Write Brothers Inc.](#), Burbank, CA — June '00 to March '09

- Architect of the next generation of Write Brothers' flagship product, Movie Magic Screenwriter. Screenwriter is a specialized word processor for film, television, and stage writers. This project involved a from-scratch design and implementation based on the Cocoa Advanced Text framework from Apple and using the open-source Cocotron project to port from Mac to Windows. While this project gave me the opportunity to immerse myself in Apple's Cocoa framework for a year, it was cut short when the '09 recession forced Write Brothers to scale back its business.

- Maintained and added a variety of features to [Movie Magic Screenwriter 6](#). Screenwriter 6 runs on Mac and Windows and is recognized as the standard tool for professional screenwriters worldwide.
- Carbonized and updated [Dramatica Pro](#) to run natively in Mac OS X. Dramatica is built upon a proprietary cross-platform framework I originally developed in the early nineties. Along with Movie Magic Screenwriter it can be found on the shelf at your local Apple store.
- Architect and lead engineer of [Word Menu](#), (**Figure 4**) an English language dictionary organized into a hierarchy of categories and employing modern user-interface techniques to quickly browse and search the content. Downloadable demos for Windows and Mac OS X are [available online](#). Word Menu is implemented as three modules: a portable engine, an MFC-based Windows UI, and a Carbon-based Mac OS X UI.
- Added a variety of features to [StoryView 2.0](#), a compelling visual outlining tool for writers. StoryView is an MFC-based, Windows-only application featuring a patented user-interface for displaying and editing data that has both chronological and hierarchical structure (i.e. stories). This project involved a team of four engineers using a formal team methodology based on the software Capability Maturity Model.

Software Engineer, [MusculoGraphics Inc.](#), Evanston, IL — August '97 to June '00

- Ported MusculoGraphics' flagship product, [SIMM \(Software for Interactive Musculoskeletal Modeling\)](#) (**Figure 5**) from SGI Irix/GL to MS-Windows/OpenGL, and added several major features for the release of version 2.0 including: muscle wrapping, bone deformation, and motion capture support. The SIMM Biomechanics Software Suite is a powerful tool kit that facilitates the modeling, animation, and analysis of 3D musculoskeletal systems. Unlike traditional animation and CAD packages, SIMM is specifically designed to work with systems that consist of bones, muscles, ligaments, and tendons.
- Lead programmer for LTS (Limb Trauma Simulator) (**Figures 6 and 7**), a multi-threaded realtime surgical simulator consisting of a dual-cpu Windows-based PC controlling two [Sensable Phantom](#) force-feedback devices for spatial input and haptic output, and a dual-cpu SGI Octane for stereoscopic realtime 3D display. I wrote most of the code and shared design responsibilities with one other engineer. I worked on all aspects of the simulator including the overall architecture, graphics engine, haptic force feedback, and TCP/IP-based communication between the graphics and haptics computers. The original version of LTS was funded by a DARPA contract and is being used to train medics at the Uniformed Services University in Maryland and at Fort Bragg in North Carolina. A second generation version of LTS is being used by Hong Kong University to teach IV needle insertion to nursing students.

Software Engineer, [Electric Image Inc.](#), Pasadena, CA — March '93 to August '97

- Co-authored a cross-platform (MacOS, Win32, Unix/X11), object-oriented 3D application framework for Electric Image's next-generation modeling and animation software. This framework was eventually released as the product Electric Image Universe, after my departure.
- Designed and implemented character animation tools including skeletal and free-form deformations (**Figure 8**) based on papers presented at SIGGRAPH '89 (Chadwick et al) and SIGGRAPH '86 (Sedberg and Parry). These tools were created in my own custom 3D testbed and eventually integrated into Electric Image's 3D animation suite.
- Designed, and wrote Renderama 1.0, Electric Image's distributed network rendering system. This involved implementing client and server applications communicating via TCP/IP and AppleTalk.
- Designed and implemented 3D spatial deformations for Electric Image Animation System 2.0 (**Figure 9**) based on a paper presented at SIGGRAPH '84 (Barr). This became the most sought-after new feature of EIAS 2.0, and received excellent reviews in MacWEEK 08.01.94 (page 58).
- Implemented QuickTime support in EIAS 2.0. This included creation and playback of QuickTime movies within EIAS 2.0.
- Implemented audio support in EIAS 2.0. This included capture, display, manipulation, and playback of 8-bit multichannel audio.
- Many other miscellaneous projects including: porting EI's rendering engine to the PowerMac platform, several custom GUI controls/widgets, floating palette window support under MacOS 7.x, and so on...

Software Engineer, [Screenplay Systems Inc.](#), Burbank, CA — May '90 to March '93

- Designed, coded and documented two C++ class libraries -- one to provide generic container classes, memory management and I/O, another to provide a portable GUI application framework. Together these libraries comprise 76 C++ classes built upon the Win32 and Mac OS Toolbox APIs. Additionally I ported

the container class library to Unix System V and Mach platforms. Screenplay Systems has shipped at least three applications based on these libraries.

- Worked on "Movie Magic Budgeting II", Screenplay Systems' 2nd-generation movie budgeting application. MMB is a single-user, hyperlinked spreadsheet application complete with a byte-compiled macro language. MMB makes use of the class libraries mentioned above to target both Mac OS and Windows with one set of source code.
- *During my three years with Screenplay I received four promotions. Upon departure I was the senior engineer in a company of 16 employees.*

Software Engineer, Digital Etc. Inc., Santa Monica, CA — April '89 to May '90

- Worked in a team of three programmers developing a small-business accounting program for the Apple Macintosh.

Programmer, Anderson Consulting Inc., San Francisco, CA — September '87 to March '89

- Designed and coded a PC-based expert system prototype for the California Department of Transportation to automate the decision process involved in issuing State Highway Encroachment Permits.
- Trained in SmallTalk-80 object-oriented programming environment at ParcPlace Systems Inc.
- *Received highest possible evaluation upon completion of first year of service.*

Student Intern, Irwin Magnetics Inc., Ann Arbor, MI — May '86 to May '87

- Designed a spring and roller mechanism to ensure easy and secure magnetic tape cartridge insertion into a magnetic tape drive for PC and Macintosh computers.
- Designed a dynamometer used to test electrical motors after assembly in tape drive units.
- *Offered permanent position and financial aid toward college graduation.*

Student Intern, IBM, Manassas, VA — Fall '85

Student Intern, IBM, Poughkeepsie, NY — Summer '84 and Winter '85

- Designed and coded a system of computer programs to trace and plot electrical circuits from VLSI physical design data using IBM's Unified Shapes Checking language in conjunction with CLIST/PDF routines.
- Conducted failure analysis on logic and array chips using optical and scanning electron microscopes.
- *Received a bonus for accomplishments, and offered a permanent position upon graduation.*

Education

[University of Michigan, College of Engineering](#) — B.S. Engineering 1987

Highlights include upper level coursework in computer graphics in which I designed and wrote a 3D graphics editor on a late-80's era Apollo workstation as a semester project (which the professor saved as an example for future classes), as well as diverse coursework in computer engineering, mechanical engineering, math, science, psychology, political science, and literature.

Enthusiast, Contract, and Miscellaneous Programming

- Continuing work on Bounce, my homespun, general-purpose framework for realtime dynamic simulation, data visualization, and whatever else catches my eye (**Figures 2 and 3**).

In recent years I've used this code base for browsing voxel data sets, viewing motion capture data, creating virtual Lego models, and most recently running dynamic simulations with the help of the [Open Dynamics Engine](#) and [Bullet Physics SDK](#). Bounce is OpenGL-based and runs on Mac OS X and Windows. Porting to Linux would take a week or less.

- Wrote platform-independent parsers for Adobe Type I and TrueType fonts as a contract job for [Zaxwerks, Inc.](#)
- Wrote a set of command-line programs in ANSI C to help a friend analyze her dissertation data. Sold the software to a psychology research team at the Institute for Juvenile Research at the University of Illinois at Chicago.
- Wrote a set of text filters using `lex' to help my mom automatically pipeline the results of Lexis database searches directly into Orbit database queries. These programs are currently available as shareware and are in use by patent searchers in the U.S. and France.
- Wrote software to view CT/MRI volume data on my NeXTstation at home. This project included an implementation of an implicit surface finding algorithm from the SIGGRAPH '94 course notes (Bloomenthal '94).

Personal Interests

- Spending time with my family.
 - Taking evening art classes at the [School of the Art Institute of Chicago](#) and the [Evanston Art Center](#). Enjoy the results for free at [my personal web site](#).
 - Rennovating our 1920's-era Chicago-style bungalow.
 - Coaching youth baseball and soccer.
 - Running (including one marathon and two half-marathons -- though that was long ago).
 - Building Legos with my kids, or anyone who wants to.
 - Member: ACM, SIGGRAPH, IEEE Computer Society, Tau Beta Pi Engineering Honor Society.
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