

Resume

Michael Shantz, PhD.

Michaelshantz@sbcglobal.net

Education

PhD Eng. Science, **California Institute of Technology**, Pasadena, CA

MS BioMedical Engineering, **Drexel University**, Philadelphia, PA

Professional Experience

Garage Projects (2000 – present)

Simulation & Energy Engines

Java3D **physical simulator** for 4-rotor flyer: graphics, dynamics, stabilization. Machined a Stirling Engine. Made model wind engine using Ross Yoke with airfoil. Made model wave power boat with air pressure energy store.

Stanford University Research Project Collaboration

Mesicopter project. Built quad-rotor flyer. Wrote embedded software for PIC17, RF, TX, RX circuits, rate gyros, PID stabilization. Helped grad student on flexinol actuated miniature robot.

Toy Design

Designed and built prototypes for toy company. Wireless control, IR communication, embedded software, microcontrollers. Built plastic injection molding machine, machined molds. Developed IR TX, RX, battery charger circuits, Cygnal C8051 MCU microcode. One patent.

Intel Corporation, Principal Engineer (1994 - 2000)

Designed and developed **3D graphics** APIs and 3D database systems using C, C++, OGL, DirectX. Contributed to Java3D spec. Researched texture mapping, caching algorithms, and visibility culling. Mathematical modeling of the physics of articulated body dynamics including structural recursion, kinematic loops, contact forces, collision detection, integral properties, joint limits, motion capture, culling. Genetic Programming approaches to behavior modeling. Researched Java Servlet methods for **web interfaces** to wireless actuator, sensor devices.

BioCad Corporation, Sr. Engineer (1990 - 1993)

Molecular modeling for drug design, 3D graphics, user interfaces. C, C++, OGL. Startup.

Sun Microsystems, Distinguished Engineer (1982-1990)

2D, 3D graphics software development and management using C, Unix. Research on NURBS curves and surfaces and adaptive forward differencing. Four SIGGRAPH papers published. Five patents on various 3D graphics algorithms. Managed team integrating high performance 3D graphics acceleration into the OS. Sun employee number twelve.

DeAnza Systems, Software Engineer (1979-1982)

Imaging device diagnostics, Image processing and vision software development.

Computer & Misc. Expertise

JAVA, Java3D, C, C++, OGL, servlets, applets, HTML, MATLAB, PIC & Cygnal IDE, Schematic & Layout, Eclipse, Windows, Linux, MS Office, Jigsaw, Photoshop.

Image & signal processing, 3D graphics, physical modeling, simulators, linear systems, control theory. Machining and model making (Sherline lathe & mill).

Selected Publications

- 1) Bishop L., Eberly D., Finch M., Shantz M., Whitted T., "Designing a PC Game Engine", IEEE CG&A, February 1998
- 2) Chang S-L., Shantz M., and Rocchetti R., "Rendering Cubic Curves and Surfaces with Integer Adaptive Forward Differencing", Proceedings of SIGGRAPH '89, Computer Graphics, vol 23, 1989.
- 3) Cox, M., Bhandari, N., Shantz, M., "Multi-Level Texture Caching for 3D Graphics Hardware", ISCA '98
- 4) Kahn, S.D., Chappell G., Smellie A., Shantz M., Teig S., "Knurls: Effective 3D Intra-Molecular Manipulation with a 2D Device", Proceedings of ACM CHI '94, pg 291.
- 5) Lien S-L., Shantz M., and Pratt V., "Adaptive Forward Differencing for Rendering Curves and Surfaces," Proceedings of SIGGRAPH '87, Computer Graphics, vol. 21, 1987.
- 6) Park B. H., Shantz M., Prinz F. B., "Crawler: Insect-size robots with embedded shape memory alloys, Proceedings of SPIE Vol. 4327, 13, March 5-8, 2001.
- 7) Roberts H. L., and Shantz M., "Processing display system architectures", SPIE Vol. 301, pg. 83, 1981.
- 8) Reshetov A, and Shantz M., "Hybrid Dynamics using Symbolic Structural Recursion", (published only on web).
- 9) Shantz M., Reshetov A., "Physical Modeling for Games", Computer Game Developer's Conference, May 1998.
- 10) Shantz M., Krasnov D., Kibkalo, A., Subbotin, A., Xie, F., and Park T., "Building Online Virtual Worlds", Graphicon '96, July 1-5 1996, GRAFO Computer Graphics Society, State Education Center, Saint Petersburg, Russia.
- 11) Shantz M., and Lien S-L., "Shading Bicubic Patches," Proceedings of SIGGRAPH '87, Computer Graphics, vol. 21, 1987.
- 12) Shantz M., Chang S-L., "Rendering Trimmed NURBS with Adaptive Forward Differencing," Proceedings of SIGGRAPH '88, Computer Graphics, vol. 22, 1988.
- 13) Shantz M., "Two-pass warp algorithm for hardware implementation", SPIE Vol. 367, pg. 160, 1982.
- 14) Shantz M, and Feng Xie, "Modeling Good and Evil in Autonomous Virtual Creatures", (published only on web).
- 15) Shantz M., "Global optimization in binocular vision", SPIE Vol. 360, pg. 340, 1982.
- 16) Shantz M., "Building a Dogsled", Nov 2003, <http://michaelshantz.com>.
- 17) Xie, Feng, and Shantz M., "Adaptive Hierarchical Visibility in a Tiled Architecture", 1999 Siggraph/Eurographics Workshop on Graphics Hardware, Los Angeles, August 8-9, 1999.