

Earl Vickers

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Objective: Audio DSP algorithm engineering and/or management

EXPERIENCE

2007-present **STMicroelectronics** (and Genesis Microchip), Santa Clara, CA

— Principal Audio Algorithm Engineer

- Supervised engineers in India
- Did project management and mentoring
- Designed audio post-processing algorithms
 - Stereo Widening
 - Psychoacoustic Bass Enhancement
 - Subwoofer Crossover Networks
 - Dialog Clarity Enhancement
 - Advanced Volume Leveling and Headroom Management
 - Pseudo-Stereo
 - 2->5 Channel Upmix
 - Virtual Surround
- Wrote specs for a tool for audio development and listening tests
- Worked with a patent attorney
- Worked closely with marketing
- Helped prepare for the STMicroware – Genesis acquisition discussions

2001-present **The Sound Guy, Inc.**, Saratoga, CA — Founder

(Full-time after October 2004)

- Designed, programmed, and/or managed development of cross-platform audio effects plug-ins for VST and Audio Unit formats, including:
 - SFX Machine RT (2003) – Multi-effects unit with almost 300 presets
 - SFX Machine Pro (2006) – Multi-effects, winner of 2007 Editor's Choice awards from Electronic Musician and Mac Life magazines
 - SFX Machine Pro RTAS (2008) – Upgrade for Pro Tools
 - Backwards Machine (2007) – Real-time time reversal
 - ReSpatializer (2007) – Advanced spatializer and surround panner
 - Spectral Machine (2007-8) – Frequency domain multi-effects
- Designed and managed development of cross-platform consumer applications:
 - ChatterBlocker (2006) – Conversation masker
 - Resomnia – Sleep aid program
- Managed 12 programmers and interns, plus a number of sound designers and artists
- Handled all the sales, marketing, support and other functions of the company
- Developed a frequency domain reverberation method using "spectral magnitude decay," presented a paper at the AES Convention in San Francisco, and filed a provisional patent application
- Developed analog and digital prototypes and filed a patent application for a cat collar called the "Purr Detector," which lights LEDs when it detects the cat is purring
- Did preliminary design of an audio toy (with former co-workers)
- Contract work including audio programming and litigation support

2000-2004 **Creative Advanced Technology Center (Creative Labs)**, Scotts Valley, CA — Senior DSP Engineer

- Designed an advanced compressor to minimize loudness variations between songs
- Filed for a patent (still pending) on the compression method
- Chaired a session and presented a paper at the 2001 AES Convention; the paper has been cited in a number of other papers and in one of Apple's patents
- Developed floating-point and fixed-point implementations of the compressor for Creative's sound cards and MP3 jukeboxes
- Developed the EAX4 reverb, including C++ control code and fixed-point assembly-language code, for Creative's Audigy 2 sound cards, meeting very rigorous legacy specifications including glitchless parameter changes
- Designed an advanced 10-band equalizer with parameter mapping and inter-band interference compensation, created an impressive Matlab GUI prototype, and implemented the C++ control code and fixed-point assembly-language code for use in Creative's sound cards and jukeboxes
- Supervised an intern who wrote software for extracting reverberation parameters from recorded impulse responses
- Delivered a dozen audio effects plug-ins (fixed point and floating point) in assembly language for Creative's 20K1 X-Fi processor
- Helped port the EAX4 reverb to the X-Fi processor

1999-2000 **Aureal Semiconductor**, Fremont, CA — Senior DSP Audio Engineer

- Designed and programmed an algorithm for an efficient, good-sounding host-based reverb for the Vortex driver
 - Provided I3DL2 and EAX compatibility and pitch-shifting effects
 - Enabled smooth morphing when changing from one room to another
 - Helped optimize the host-based version by reversing the network topology so all the reads could happen at one time
 - Voiced the reverb algorithm and presets
 - Helped port the reverb to an embedded platform
- Designed and programmed a sample-rate converter and various digital filters
- Wrote a number of Matlab programs for analyzing impulse responses
- Debugged and fixed pre-existing topology-related problems in the driver

1995-2001 **The Sound Guy**, El Cerrito, CA — Programmer, founder

- Designed and programmed SFX Machine, a modular synthesis and multi-effects plug-in for the Macintosh, published by BIAS, Inc.
- Wrote the time-domain time compression / expansion code used in BIAS Peak
- Developed algorithms and Matlab code for pitch-tracking, formant-corrected pitch-shifting, cross-synthesis, voice transformation, de-clipping and lip-syncing
- Did computer audio consulting for Park Place Productions, Data East, Tengen, etc.

1992-1994 **Time Warner Interactive**, Milpitas, CA — Audio Engineer / Programmer

- Wrote Macintosh software to do digital voice compression
- Wrote highly optimized (self-modifying) Z80 assembly-language code to do real-time decompression for the Sega Genesis and 32X systems
- Created sound effects, digitized speech and music for video games

- 1982-1988 **Atari Games Corporation**, Milpitas, CA — Audio Engineer / Programmer
- Developed a sound processing system for analysis, editing and resynthesis of digital audio using linear prediction, delta modulation, ADPCM, etc.
 - Developed and implemented a data compression algorithm for block companding of speech and sound effects
 - Wrote software to produce speech using Composite Sine Modeling synthesis with Yamaha FM chips (to eliminate the need for a separate speech chip)
 - Designed digital and analog hardware
 - Wrote a 68000 assembly-language sampled audio decompression and multi-channel playback engine
 - Created sound effects, speech synthesis and music for arcade games such as Star Wars, Paperboy, Gauntlet, Temple of Doom, Roadrunner, Xybots and 720°, including two of the top ten favorite arcade games of all time

- 1979–1982 **Bally/Midway Manufacturing Company** — Engineer / Programmer
- Designed an audio hardware board and received a patent for the design
 - Wrote Z80 assembly language sound driver
 - Created music and sound effects
 - Programmed an arcade video game in assembly language
 - Wrote DSP software on the Apple II to do audio sampling, pitch tracking and FFTs

EDUCATION

- 1997 **U.C. Berkeley Extension**
C++ Programming course
- 1996 **De Anza College**, Cupertino, CA
C Programming course
- 1980-1985 **School of the Art Institute of Chicago, M.I.T., and Stanford University**
Courses & Seminars in Electronic Music, Computer Audio & Signal Processing
- 1974-1978 **Duke University**, Durham, NC
BSEE degree, Cum Laude

LANGUAGES and PROGRAMS

Matlab (including Filter and Signal Processing Toolkits), C, C++, Z80, 68000, 6502, 6805, TMS320, Creative 10K1 and 20K1 X-Fi, Pascal, Fortran, AppleScript, HyperTalk, HTML, Javascript, Microsoft Office, Word, Excel, Project, CodeWarrior, Visual C++, Xcode, Visual SourceSafe, CVS, etc.

AFFILIATIONS

Member: Audio Engineering Society (AES), IEEE, Project Management Institute (PMI)

PUBLICATIONS

"Fixing the Phantom Center: Diffusing Acoustical Crosstalk," *Proceedings of the AES 127th Convention*, Paper #7916, New York, NY, October, 2009

"Frequency Domain Two- to Three-Channel Upmix for Center Channel Derivation and Speech Enhancement," *Proceedings of the AES 127th Convention*, Paper #7917, New York, NY, October, 2009

"Frequency Domain Artificial Reverberation using Spectral Magnitude Decay," *Proceedings of the AES 121st Convention*, Paper #6926, San Francisco, CA, 2006 (this work was also discussed in "Reverberation and Dereverberation," *Journal of the Audio Engineering Society*, v. 55, No. 3, 2007 March, p. 189)

SFX Machine Pro User Guide, white papers, etc., The Sound Guy, Inc., 2006-7

"Automatic Long-term Loudness and Dynamics Matching," *Proceedings of the AES 111th Convention*, Paper #5495, New York, NY, 2001

"Using Voice to Bring Game Characters to Life" (with Wally Fields), *Computer Game Developer's Association*, 1995

Short stories published in English, and Russian and Japanese translations by third parties

References available on request