Curriculum Vitae
John M. Strawn, Ph.D.
(contact information on last page)

Professional Profile

Several decades of involvement in software, digital audio, digital music, digital signal processing, and processor architecture. Successful independent software consultant in high-level languages and assembly language. Seasoned testifying expert with litigation experience (patent, copyright, trade secret, class action), skilled at explaining complex ideas to attorneys and juries. Stanford Ph.D. Former Fulbright Scholar. Prolific author. Experienced manager with long-range research and development experience. Facile with foreign languages and working with people from outside the USA.

Professional Experience

From: 1992 **S Systems, Inc.**
To: Present Larkspur, CA
Position: *Owner and Full-time Consultant*
Duties: Full-time independent consultant:

- **Programming** hand-crafted audio and music software for signal processing, written in C, C++, JAVA, and especially assembly language for digital signal processing chips. Consulting on processor architecture and networking. See Consulting Assignments, below.
- **Testifying Expert witness** in patent litigation relating to software and source code, digital devices, processor architecture, media, compression, signal processing and client/server interactions. See Expert Witness section, below.

From: 1987 **Yamaha Music Technologies USA**
To: 1991 Larkspur, CA
Position: *1989-1991: President; 1987-1989: Vice President*
Duties: Helped establish and manage a nine-person Ph.D.-level research group, including site search, architectural design, construction, move-in, and hiring. Conducted original research on electronic musical instruments, software, micromachining, networking, and recent technological developments. Extensive experience designing scientific, engineering, and musical object-oriented applications, especially C++ (UNIX). Research on Yamaha's Vocaloid started in this group. Patent listed below.

From: 1986 **S Systems**
To: 1988 Larkspur, CA
Position: *Owner and Full-time Consultant*
Duties: This was my first stint as a consultant. See Consulting Assignments, below.

From: 1985 **Lucasfilm/Droid Works**
To: 1986 San Rafael, CA
Position: *Programmer*
Duties: Full-time programming experience as an employee, designing signal-processing modules and writing (96-bit VLIW) microcode for the ASP/SoundDroid developed by James A. Moorer. Experience in audio and video post-production. Extensive work in C (Unix). Another six months full-time experience writing tightly packed assembly code for the TI TMS32010 signal processor, especially for a two-channel hard-disk audio record playback unit that played without bugs on the exhibit floor of the National Association of Broadcasters convention, 1986.

From: 1976 **Stanford University**
To: 1985 Stanford, CA
Position: *Doctoral Student*
Duties: Nine years programming experience developing code in high-level languages (Algol, Fortran, SAIL) and PDP-10 assembly language for musical and audio signal processing applications during doctoral thesis work. My Ph.D. dissertation (*Modeling Musical Transitions*, 1985) involved original published research in spline fitting and pattern recognition, a 30,000-line two- and three-dimensional graphical editor for waveforms and spectra, implementation (with John Gordon) of the short-time Fourier transform, device drivers, and libraries for graphic user interfaces. Also part-time consulting work:

- SRI International (FORTRAN for mechanical engineering).
- Mattel Electronics (music in consumer electronic toys).
- IntelliGenetics (ALGOL-like code for biotechnology).
- Digital Keyboards (product specification and complete manuals for GDS and Synergy Synthesizers).

From: 1972 **Revox**
To: 1972 Long Island, New York
Position: *Summer intern*
Duties: Solder cables, write German- and Dutch-English translations, manufacture PC boards, assemble hardware.

Education and Training

Year	College/University	Degree
1985	Stanford	Ph.D., CCRMA. Advisor: John Chowning. Graduate course work in music, computer and processor architecture, high-level and assembly-language programming, digital audio, digital signal processing, acoustics, psychoacoustics, and digital hardware. Dissertation on analysis of music instruments with the short-time Fourier transform. Software development experience listed elsewhere in this resume.
1975-1976	IBM Thomas Watson Foundation	Grant to study electronic music, Tokyo, Japan, 1976. Live performances on piano and Roland System 700 analog synthesizer. Also travel through Turkey, Iran, Afghanistan, Pakistan, India, Thailand, and Hong Kong.
1973-1975	Technical University, Berlin	Fulbright Scholar. Graduate-level coursework in music theory/history, audio engineering, electronics, information theory, cybernetics, Japanese; all coursework in German. Extensive recording studio and live concert sound reinforcement experience. PDP-11 and PDP-8 assembly and machine language. Travel throughout Europe.
1968-1973	Oberlin	B. Mus, double degree in organ performance and music theory. Exchange semester, University of Hamburg, Germany, 1971, course work in German literature and psychology. Experience with analog synthesizers and digital music synthesis, BASIC, FORTRAN, MUSIC V on an IBM 360.

Expertise

- Testifying expert witness (including expert reports, deposition).
- Software analysis for litigation including patent, copyright, trade secret, software theft.
- Implement/optimize signal processing algorithms: Fourier transform (FFT), discrete cosine transform (DCT), DTMF, speech synthesis.
- Port/optimize audio compression algorithms: AC-3, MP-3, AAC.
- Implement audio algorithms: reverberator, pitch shifter, sample rate converter, compressor, filter, flanger, 3-d audio (Dolby surround), dither.
- Implement music synthesis (additive, physical modeling, wavetable, FM).
- Create bug-free software from academic signal processing research.
- Work in floating- and fixed-point math.
- Assembler, object-oriented, C, C++, HTML, XML, Javascript, SQL.
- Extensive experience optimizing code in assembler
- PC, Mac, Unix.

- DSP architectures: Motorola 56000, 56300, and 56800 families; TI TMS320C10 and TMS320C54 family; Code Composer Studio; Analog Devices 21xx family and TigerSharc; VLIW; custom processors; I learn new architectures quickly.
- Embedded processors: Hitachi SH-DSP, SH3-DSP, SH-4, and SH-5; ARM7/ARM9; configurable processors (Tensilica).
- Processor architecture.
- Debugging hardware prototypes.
- Audio networks, such as AES/EBU (IEC 60958), IEEE-1394/FireWire, AV/C, 61883, mLan, and others.
- File downloading.
- Practical audio experience in live sound and in studios.
- Functionally bilingual in German; able to read French, Dutch; some Japanese

Expert Witness and Litigation Support Experience

Summary: 16 depositions to date, 3 times testimony at trial, 9 IPR declarations. Patent litigation, ITC investigations, Inter Partes Reviews, USPTO declarations, class action litigation, trade secret litigation, copyright litigation involving software. Expert reports, declarations, prior art research and analysis, infringement analysis (*e.g.*, analyze devices, documents; source code analysis, source code comparison), claim charts, tutorials, Markman hearings. Technical areas include software and source code; computers, laptops, cell phones, mobile devices, handheld devices (*e.g.,* medical); processor architecture; user interfaces; media: audio, music, speech, video; compression (*e.g.,* MPEG, MP3); digital signal processing, mathematics, algorithms; file downloading, file streaming, client/server; protocols such as internet protocol (IP); video games.

Date: 2017 - present **Lilenfeld PC**

Case: Atlantic Recording Corporation et al. v. Spinrilla et al., GAND 1-17-cv-00431.

Project: Analyze Ruby source code for hip hop music web site. Evaluate methods for identifying sound recordings. Engaged by defendants accused of copyright infringement. **Expert report, deposition.**

Date: 2017 - present **Katten Muchin Rosenman**

Case: Rogue Wave Software v. BTI Systems and Juniper Networks, NYSD-1-16-cv-07772.

Project: Analyze Java source code involving graphic user interfaces and remote control of Internet hardware. Compare versions of source code. Reconstruct source code from obfuscated deposit copy filed with US Copyright Office. Engaged by defendants accused of copyright infringement. Two **expert report**s.

Date: 2017 **Coberly Law; Paine Bickers**
Case: Artemetrx, Specialty Drug Solutions, and Pharmaceutical Strategies Group, v. Archimedes et al.; Davidson County Chancery Court, Nashville, TN, Case No. 16-0913-II.
Project: Analyze SQL source code and databases involving pharmaceutical billing, engaged by defendants accused of misappropriation of trade secrets.

Date: 2016 - 2017 **Fish, Richardson**
Case: Two Inter Partes Reviews for Samsung.
Project: Investigate validity of patent owned by Tivo related to real-time audio/video streaming, recording and playback, and DVR (set top box) architecture. Research. Invalidity **declaration**. (IPR2016-01524; IPR2016-01712).

Date: 2016 - 2017 **Perkins Coie**
Case: Crest Audio v. QSC Audio Products, MSSD-3-12-cv-00755
Project: Analysis relating to claim construction and non-infringement for two amplifier patents.

Date: 2015 - 16 **Denko, Coburn, Lauff**
Case: Andrea v. Intervenor Waves (Israel) and Respondent Dell, ITC 337-TA-949
Project: Patents related to noise reduction, adaptive filtering, and echo cancellation for speech in laptops. Source code analysis (C, C++). Compare versions of source code. **Expert report** on non-infringement, two patents. **Deposition.**

Date: 2014 - 16 **Orrick**
Case: Blue Spike v. Texas Instruments, TXED 6-12-cv-00499, for lead defendant Audible Magic.
Project: Patents related to automatic recognition of video and audio based on signal processing and human perception. Source code analysis (C, C++, Visual Basic, SQL, XML). Declaration. **Two expert reports**, one on non-infringement (four patents), one comparing versions of source code. **Deposition.**

Date: 2014 - 15 **Wiley Rein**
Case: Six petitions for Inter Partes Review by Verizon (IPR2015-00349, -00350, -00364, -00376, -00380, -00383, -00391).
Project: Investigate prior art relating to cell phone ring tones. Research. Invalidity **declaration**.

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