

Curriculum Vitae

Gareth Loy, DMA

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Professional Summary

Dr. Loy has over 32 years of academic and professional experience in, computer science, software development, embedded systems, networking, and digital audio signal processing, and music technology. He has over fifteen years of experience as an expert witness on numerous cases. He has published three books with the MIT Press and his research has been published in various juried journals.

He has testified before a jury under oath, presented exhibits and Markman tutorials in Federal Court, has worked on complex international patent cases, and provided expertise on diverse cases such as computer technology related to handheld networked Personal Information Management (PIM) devices, enterprise email systems, enterprise software for management of sound libraries (iTunes), copyright litigation, audio compression, automatic music composition systems, factory automation software, online gaming, and more.

He has published widely in juried journals and conference proceedings, and is the author of *Musimathics*, published by the MIT Press (2006, 2007), treating the mathematics of music (volume 1) and digital audio signal processing (volume 2). He did his graduate studies at the Stanford Artificial Intelligence Laboratory (SAIL) and the Center for Computer Research in Music and Acoustics (CCRMA), both of Stanford University. He was a cofounder of the Computer Audio Research Laboratory at UCSD and spent a decade conducting computer systems architecture research and teaching digital audio and computer science at UCSD. He has been a Software Architect for consumer and professional digital audio products for large international electronics companies, and has sustained a long and successful career at the cutting edge of multimedia computing as a consultant.

Although my original interest was music, it was mandatory for me to shift gears professionally when it became evident that the future of music was being radically transformed by computer technology, intense refocus in software and computer technology. Thus, launching me into the field of technical expertise.

Expertise

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- Large Scale Software Analysis/Development in C, C++, Java and other languages
- Embedded Systems Software
- Parallel Processing Software
- Software Architecture for consumer and professional computer products
- Enterprise Networked Systems
- Compression Standards
- Real-time Systems
- Music Technology
- Digital Audio Signal Processing

Projects and Skills

Software Engineer and Systems Architect

- 32+ years experience as a C/C++/Java engineer, systems architect, researcher
- Architected numerous large-scale software and hardware systems, debugged prototype multiprocessor systems, realtime systems with VxWorks, developed embedded systems, written file systems, assemblers, compilers, linkers/loaders, user-level applications, home entertainment systems, and professional audio recording systems
- Embedded systems software design and implementation
- Direction and management of research and software development projects
- Digital audio signal processing, systems software for custom computing platforms
- Parallel-processing systems software

Engineering

- Over 30 years as a C/C++ programmer on PC, UNIX, MacIntosh, Windows, Developer Studio, LINUX, VxWorks, and WindRiver platforms
- Computer programming development with yacc and lex
- Realtime programming with VxWorks
- Academic background in computer science
- Research project administration
- Comprehensive understanding of digital signal processing for audio
- Systems programming, device drivers, file systems, systems administration
- Multiprocessor systems programming
- Synthesis algorithm design, spatialization, sound design
- Multimedia computing

Writing

- Design, debug, and document complex processor Instruction Set Architectures
- Build automatic document generation systems that create finished documents directly from commented code sources, or create instruction set architecture documents directly from machine description files.
- Design, comprehend, and document software, hardware, and VLSI architectures.
- Collaborate with designers to patent intellectual property, review patents for applicability, and drive the review process with the US Patent Office.
- Collaborate with marketing to produce requirements documents that relate directly to architectural realities.
- Collaborate with software engineering to create and document software specifications and APIs.
- Establish and coordinate documentation methodology, terminology, and templates.
- Provide frameworks and tools for architects, managers, marketing, software, and hardware designers to communicate their work.

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- Interpret and translate between the sometimes-orthogonal perspectives of engineering specifications and marketing requirements.
- Encapsulate large, complicated systems into easy-to-understand words and pictures that capture the essence of a project, suitable for orienting customers, partners, new engineers, and marketing personnel.
- Co-write technical papers with hardware and software engineers for presentation to technical journals and conferences.
- Transform specifications into architectural documents and data sheets.
- Manage and administer network-based document development and archival systems to secure and protect company intellectual property.
- Clarify to the architects the specifics of what they are designing, based on their code, engineering notes, email, meetings, and conferences.

Technical Writer

- Contract technical writer for computer and semiconductor manufacturers, internationally
- Have written architecture documents for large multicore processors such as Raza Microelectronics XLR, Philips Trimedia Instruction Set Architecture
- Have done projects for Sony, Infineon, Dolby Laboratories, Chromatic Research (ATI), Cradle Technologies, and many others.

Education

<u>Year</u>	<u>College or University</u>	<u>Degree</u>
1980	Stanford University	D.M.A. (Doctor of Musical Arts), Computer science, signal processing, computer music composition, from the Stanford Artificial Intelligence Laboratory (SAIL), and the Center for Computer Research in Music and Acoustics (CCRMA).
1975	San Francisco State University	B.A., Music

Professional Experience

From: 1998
To: Present
Organization: Gareth, Inc., Corte Madera (Marin County), CA.
Title: President
Summary: Provide software engineering, and litigation support to high technology companies, internationally

From: 2003
To: 2004
Organization: Sony Corporation of America
Title: Software Architect, Super Audio CD Project

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Summary:

- Developed a 48-track DSD pro audio recording system
- Improved system design to meet project goals, extended interface capabilities, met aggressive project deadlines

From: 1994

To: 1998

Organization: Chromatic Research, Inc.

Summary: 1997-1998: Senior Information Engineer

- Wrote hardware architecture documentation for next-generation multi-media processor
- Wrote software API reference documentation for multi-media processor

1994-1997: Senior Digital Audio Engineer

- Reverse-engineered popular FM synthesis chip, and reduced it to software simulation running on Mpcat processor
- Reviewed extensive music synthesis patent law, advised on patent protection strategies and work-arounds to patented signal-processing technologies.
- Led wave-table synthesis project, hired & managed voicers, licensed sound libraries, specified the synthesis architecture, interfaced between marketing, engineering and voicers
- Represented Chromatic at the MMA's IASIG 3DWG (3D audio industry group of the MIDI Manufacturer's Association)
- Spearheaded the successful effort to pry Microsoft's 3D audio API open to hardware acceleration
- Consulted on 3D audio subsystem design

From: 1995

To: 1995

Organization: Sonic Solutions; Novato, CA

Title: Senior Digital Audio Engineer

Summary: Specified, architected, and implemented track-based recording system for automatic dialog replacement (ADR) and Foley

From: 1988

To: 1993

Organization: Frox, Inc., Milpitas, CA

Title: Digital Audio Systems Architect and Project Lead

Summary:

- Member of VLSI design team that developed a custom stream-oriented move engine that linked an array of up to 16 Motorola 56000's, operating synchronously at the instruction and sample level
 - Features included subsampling, 24x24 AES-EBU serial link I/O, and both asynchronous parameter update and synchronous data movement to/from a host computer
- Debugged brass-board and ASIC implementation of move-engine with architects.
- Designed and implemented the user interface, system model, and control system for a parallel-processing multiple-DSP audio subsystem
- Implemented Lucasfilm THX processing, Dolby ProLogic, concert hall simulation and other forms of audio processing
- Wrote marketing documentation, white papers, delivered papers at conferences

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- (AES and ICMA), and wrote support documentation
- The FroxSystem received the Industrial Design Excellence Award (IDEA) Bronze Award for excellence in User Interface Design; Popular Science Magazine's Best of What's New Award for Audio and Video Products, AudioVideo Magazine's Grand Prix Award, CES/EIA Innovations '93 Award

From: 1980
To: 1989
Organization: University of California, San Diego, CA, Music Department with concurrent appointment as Director of Research at the Computer Audio Research Laboratory (CARL), part of the Center for Music Experiment (CME), an Organized Research Unit (ORU) of the University of California, San Diego (UCSD)
Title: Researcher, Lecturer, Administrator, Director of Research
Summary:

- Conducted original research in computer architectures for digital signal processing of music and musical performance
- Lecturer in graduate computer music sequence: principles and practice of digital audio and computer science, and undergraduate musical acoustics, and electronic music
- Wrote numerous scholarly articles for various publications on original research topics
- Responsible for development and distribution of the CARL Software Distribution, a collection of research software developed at CARL for use at collaborating sites
- Supervised staff and research assistants, directed projects
- Designed, specified, and installed computing laboratories and instructional facilities

From: 1978
To: 1979
Organization: Apple Computer, Inc., Cupertino, CA
Title: Technical writer
Summary:

- Wrote user manuals for the original Apple II: Fortran, Basic, text editing
- Developed Apple's first self-documenting text editing paradigm

Litigation Support Experience

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Flachsbart & Greenspoon
Case Name: 1st Media. v. Electronic Arts, Inc., Harmonix Music Systems, Inc., Microsoft Corporation, Viacom, Inc. and Sony Computer Entertainment America, Inc., Case No. 2:07-cv-1589-JCM-RJJ, United States District Court, District of Nevada, Judge: Kent J. Dawson
Patent at issue: U.S. Patent No. 5,464,946
Services Provided: Testifying witness: Inequitable Conduct

- Evaluate materiality of pertinent prior art for plaintiff's patent, rendering expert opinion, deposition, declarations, briefs

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Disposition: Ongoing
Date: 2009
Contact: William W. Flachsbart, Robert Greenspoon, 312-431-3800

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Flachsbart & Greenspoon
Case Name: ValueClick, Inc. v. Tacoda, Inc., Case No. 2:2008cv04619, California Central District Court, Western Division - Los Angeles Office, Judge Dale S. Fischer
Services Provided: Testifying witness: Patent infringement

- Patent and technology infringement analysis of Tacoda's behavioral advertising product, rendering expert opinion, declarations, briefs

Disposition: Ongoing
Date: 2008
Contact: William W. Flachsbart, Robert Greenspoon, 312-431-3800

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Quinn Emanuel Erquhart Oliver & Hedges, LLP
Case Name: Activision Publishing, Inc. v. Gibson Guitar Corporation. Case No. CV08-01653 MRP (SHx) Central District Court of California, Hon. Mariana R. Pfaelzer
Services Provided: Testifying witness: Patent infringement

- Patent and technology infringement analysis of Activision's Guitar Hero product, rendering expert opinion, declarations, briefs

Disposition: Won on summary judgement
Date: 2008 – 2009
Contact: James M. Glass (212) 849-7000, Edward J. DeFranco (212) 849-7000

Expert Engagement:

Type of Matter: Copyright litigation
Law Firm: Cooley Godward Kronish LLP
Case Name: Atlantic Recording Corp. et al v. XM Satellite Radio Inc., 06 CV 3733 (LAK), Famous Music LLC et al v. XM Satellite Radio Inc., 07 CV 2385 (LAK) and Nota Music Publishing, Inc. v. XM Satellite Radio Inc., 07 CV 4682 (LAK), Southern District Court of New York, Judges Batts and Kaplan

Services Provided: Testifying witness: Copyright infringement

- Analysis of XM Satellite *inno* product to determine whether it meets the criteria of a DARD

Disposition: Ongoing
Date: 2008
Contact: Steven A. Wieder (212) 479-6263

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Flachsbart & Greenspoon
Case Name: 1st Technology LLC, v. Tiltware LLC, Civil Action No. 2:06-cv-323-LDG-RJJ, U.S. District Court, Nevada

Services Provided: Testifying witness: Internet gambling

- Forensic analysis of software application, "Full Tilt Poker" to determine infringement of Lewis, 5,564,001(A)

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- Wrote expert report showing infringement of every element of asserted claims
- Analysis was performed on executable application and DLLs downloaded from Tiltware's Internet site. Analysis was performed without benefit of source code: use of Internet packet sniffing and reverse engineering of downloaded databases established infringement sufficient to obtain favorable settlement.

Disposition: Settled on terms favorable to my client
Date: 2008
Contact: Robert Greenspoon, 312-431-3800

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: McKool Smith
Case Name: Visto Corporation v. Good Technology, Inc., Case No. 2:06-cv-00039-TJW, U.S. District Court, Eastern District of Texas, Marshall Division, Judge T. John Ward

- Services Provided:
- Patents at issue: Mendez et al. 6023708, 6085192, 6151606, 6708221, 7039679
 - Consulting expert – analysis of email server applications regarding synchronization of personal information management (PIM) data to portable, wireless handheld devices (Good Mobile Messaging)
 - Conducted extensive discovery of multiple large enterprise database systems (Microsoft Exchange, Lotus Notes, others), Good's proprietary network operations systems, and Good handheld devices for Personal Information Management (PIM) manufactured and distributed by Good over the course of 6 years.
 - Conducted detailed review of over 12 gigabytes of C++ and Java source code to establish how PIM data were synchronized between enterprise databases and handheld devices. Longitudinal detailed review of multiple versions of Good's system.

Disposition: Ongoing
Date: 2007-2008
Contact: Eric Robinson, Bo Davis, 214.978.4063

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: McKool Smith
Case Name: Visto Corporation v. Research In Motion, Ltd., Case No. 2-06-CV-181-TJW, U.S. District Court, Eastern District of Texas, Marshall Division, Judge T. John Ward

- Services Provided:
- Patents at issue: Mendez et al. 6023708, 6085192, 6151606, 6708221, 7039679
 - Consulting expert – analysis of email server applications regarding synchronization of personal information management (PIM) data to portable, wireless handheld devices (Research In Motion/BlackBerry)
 - Conducted extensive discovery of multiple large enterprise database systems (Microsoft Exchange, Lotus Notes, others), RIM proprietary network operations systems, and RIM handheld devices for Personal Information Management (PIM) manufactured and distributed by RIM over the course of five years.

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- Conducted detailed review of over 130 gigabytes of C++ and Java source code to establish how PIM data were synchronized between enterprise databases and handheld devices. Longitudinal detailed review of multiple versions of RIM's system.

Disposition: Ongoing
Date: 2007-2008
Contact: Eric Robinson, Bo Davis, 214.978.4063

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Vanek, Vickers & Massini
Case Name:

- Premiere International Associates LLC v. Apple Computer, Inc. No. 05-CV-506, U.S. District Court Eastern District of Texas Marshall Division, Judge T. John Ward
- Patents at issue: Hempleman et al. 6,763,345, 6,243,725

Services Provided:

- Consulting expert /software analyst: white-box analysis of Apple iTunes software source code written in C/C++, and iTunes Store (iTMS) enterprise software source code written in java and SAP/ABAP.
- White-box source code analysis was performed of seven versions of iTunes from the original release through version 7.1 for infringement of more than 100 claims. Each version of iTunes constituted in excess of 800,000 lines of C/C++. Analysis was performed on Windows (using Visual Studio .NET IDE) and Macintosh (using XCode and CodeWarrior IDEs).
- Static analysis of enterprise software source code for Apple's iTunes Store, which handles transactions with iTunes users on the front end and manages a large enterprise database. Over 1.4 million lines of java.
- Identify relevant files and functions for the various claims, debug the code, plant breakpoints, caption and print stack traces, identify what the program was doing and identify specific lines of code for potential infringement.
- Conducted extensive source code review of Apple iTunes application to determine potential infringement of playlist technology
- Determined the exact manner of iTunes operation for playlist management in the form of stack traces, documented significance of breakpoints to infringement arguments

Disposition: Settled on terms favorable to my client
Date: 2006-2007
Contact: Joe Vanek, 312.224.1502

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Quarles & Brady
Case Name:

- (Case settled before being filed)
- Patents at issue: Hufford 5693902, 5877445

Services Provided:

- Testifying expert – music composition, software architecture, digital audio
- Forensic software analysis of Sony Corporation of America product Cinescore 1.0
- Reviewed Cinescore 1.0 for potential infringement of patents relating to automatic composition of music
- The patents covered a method of music composition by audio segment concatenation.
- Drafted potential infringement report

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Disposition: Settled on terms favorable to my client
Date: 2007
Contact: David R. Cross: 414.277.5669

Expert Engagement:

Type of Matter: Patent litigation support
Firm: S-Systems, Inc.
Case Name: Digeo, Inc. v. Audible, Inc., Case No. C05-00464-JLR, Seattle
Patent at issue: Saigh, et al. 5,734,823
Services Provided:

- Consulting associate to S-Systems: software architecture, digital audio
- Analysis of a large (over 13,000 files) C++ project that implemented a Windows .NET application to perform management of audio content, encryption, audio downloading from the Internet, and device integration for handheld players. The assignment was to determine whether the application could be shown to infringe patent claims. I was tasked to identify the relevant files, compile them, correct program errors and create workarounds so that the executing application could be evaluated, evaluate the execution of the code, plant breakpoints, walk the stack, identify what the program was doing and identify specific lines of code for potential infringement.

Disposition: Settled
Date: 2006
Contact: Please contact Gareth Loy for information about this reference.

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Wilmer Hale
Case Name: Information Technology Innovation, LLC v. Motorola, Inc. et al. (Patent at issue: 4,796,194)
Services Provided: Expert witness: software architecture

- Wrote report evaluating a 1300-line Fortran 77 software program dating from 1986. Project required me to compile and run the software, which involved identifying numerous bugs in the code and providing workarounds so that the code could be evaluated at runtime.
- Wrote expert report

Disposition: Settled on terms favorable to my client
Date: 2006
Contact: John Hintz: John.Hintz@WilmerHale.com

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: McDermott, Will & Emery
Case Name: Audio MPEG, Inc. v. Creative Labs, Inc., Creative Holdings, Inc., and Creative Technology Ltd., Case No. 2:05CV185--JBF-FBS
Patents at issue: Rault et. al., 5,214,678; Lokhoff 5,777,992; Lokhoff 5,323,396; Lokhoff 5,539,829; Grill et al. 5,579,430
Services Provided: Expert witness: Mathematics of MPEG/MP3 audio, subband coding, frame size, intensity stereo.

- Detailed claims analysis. Wrote numerous reports regarding the mathematics of MPEG/MP3 encoding/decoding process. Researched the history of the development of this highly mathematical discipline from its origins in the short time Fourier transform through its modern implementations by

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Fraunhofer and others.
Disposition: Settled
Date: 2005–2006
Contact: Robert Blanche, Chris Bright, Lucy Koh: 650.813.5133

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Weil, Gotshal, Manges
Case Name: Seer Systems, Inc. v. Beatnick, Inc. & Microsoft Inc., Case No. C 03 4636 JSW (EDL), Northern District of California, San Francisco Division, Judge: Hon. Jeffrey S. White
Services Provided: Testifying witness: music composition systems, MIDI, networking. Deposition taken. Developed and presented Markman tutorial presented before Judge White.
Disposition: Settled
Date: 2004
Contact: Jared Bobrow: 650.802.3034, Perry Clark (now at Kirkland): 415-439-1938

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Orrick, Herrington, Sutcliffe
Case Name: Aureal Semiconductor, Inc. v. Creative Technology Ltd., et al., Northern Dist. of Cal, Civil Action No. C98-4550 MHP
Services Provided: Testifying witness: regarding a means of rendering 3D digital audio.
Disposition: Aureal went out of business; assets were bought by Creative.
Date: 1999–2000
Contact: Lisa-Marie Schull (State Bar 196132)

Expert Engagement:

Type of Matter: Patent litigation
Law Firm: Buchalter Nemer Fields & Younger
Case Name: Industrial Indemnity Co. v. Apple Computer, Inc.
Services Provided: Testifying witness: digital audio and music technology
Deposition taken; testified at trial. Presented several demonstrations of Apple Computer music and audio technology to the jury
Disposition: Won on appeal
Date: 1994–1995
Contact: Stephen Sommerhalter: ssommerhalter@buchalter.com

Consulting Experience

Consulting Engagement:

Client: Buchla & Assoc.
Services Provided: Developed software architecture and implemented all software for the Buchla 259e Programmable Complex Waveform Generator. Features include: dual digital oscillators (modulating and carrier) with various waveforms, FM, AM, waveshaping, soft and hard sync, MIDI control, presets, control panel, knobs, switches and control voltages. (See <http://www.buchla.com/200e/259e.html>).
C/C++

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Consulting Engagement:

Client: Chromatic Research (bought by ATI Technologies)
Services Provided: Algorithm development for audio synthesis and processing on MPACT1 DSP.

Consulting Engagement:

Client: Frox, Inc.
Services Provided: Architected, developed, debugged, implemented, and shipped an ambitious multi-DSP digital home entertainment system

Consulting Engagement:

Client: Philips Semiconductor
Services Provided: Developed and licensed a custom C++ MSDEV application software to Philips that documented a large instruction set for a 64-bit media processor from the machine description sources. Developed a separate program to verify the correctness of the pseudocode implementation of all instructions

Consulting Engagement:

Client: Equator Technologies
Services Provided: Extended their C/C++ compiler to automatically document Equator's Application Programming Interface (API) source code for their DSP, written in C

Consulting Engagement:

Client: Raza Microelectronics
Services Provided: Wrote the XLR Programmer's Reference Manual for the XLR family of Threaded Processors

Consulting Engagement:

Client: Pixim, Inc.
Services Provided: Created Developer's Guide documenting features, architecture, theory of operation, hardware, software and firmware for advanced wide dynamic range video camera sensor technology

Consulting Engagement:

Client: Philips Semiconductor
Services Provided: Wrote Ethernet MAC chapter for new TriMedia processor architecture document

Consulting Engagement:

Client: Cradle Technologies
Services Provided: Developed design kit guide for their Hammerhead videoconferencing system including development system setup, chip architecture, software APIs, software development tools, and debugging

Consulting Engagement:

Client: Siemens Microelectronics
Services Provided: Data book for the TriCore TC10 embedded processor. User guides for TriCore simulators

Consulting Engagement:

Client: Infineon Technologies

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Services Provided: Data book for Infineon MPSystem, a single-core 32-bit microcontroller DSP architecture for real-time embedded systems

Consulting Engagement:

Client: Zoran Corporation

Services Provided: User guide for Vaddis ZR36730 Integrated DVD Decoder chip

Consulting Engagement:

Client: Dolby Laboratories

Services Provided: Market evaluation for consumer application of AC3 encoding

Consulting Engagement:

Client: Sony, Inc.

Services Provided: User Guide for the Sonoma Digital Audio Workstation

Consulting Engagement:

Client: Malleable Technologies

Services Provided: Architecture documents and data sheets for VoIP DSP core

Consulting Engagement:

Client: C-Cube Microsystems

Services Provided: Ziva-Kit DVD decoder architecture documents, and white papers on DVD decoding algorithms

Consulting Engagement:

Client: TriMedia Technologies, Inc.

Services Provided: Several chapters of the TM1100 and TM1300 Data Books, including the audio and video I/O subsystems, memory management system, and instruction compression

Consulting Engagement:

Client: BOPS, Inc. ("Billions of Operations Per Second, Inc.")

Services Provided: C/C++ optimizing compiler for their scalable multi-DSP processor system

Consulting Engagement:

Client: SeaSound, LLP

Services Provided: User Guide for the SeaSound Solo digital audio processing system

Consulting Engagement:

Client: Palm, Inc.

Services Provided: C++ Generic Conduit Guide

Professional Affiliations, Achievements & Awards

- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, Society for Industrial and Applied Mathematics (SIAM)

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- Member, International Computer Music Association (ICMA)
- Member, Audio Engineering Society (AES)
- Management Incentive Award, UCSD (1988)
- Fellow, Deutscher Akademischer Austauschdienst (DAAD), Berliner Künstlerprogramm, Berlin (1986)
- Bourges Prize, Digital Electroacoustic Music category (1981)
- National Endowment for the Arts grant recipient (1981)

Publications

1. Loy, Gareth, *Musimathics — The Mathematical Foundations of Music*, Vol. 1, Cambridge: MIT Press. 2006.
2. Loy, Gareth, *Musimathics — The Mathematical Foundations of Music*, Vol. 2, Cambridge: MIT Press. 2007.
3. Loy, Gareth, “The CARL System: Premises, History, and Fate,” *Computer Music Journal* 26(4), Winter 2002.
4. Loy, Gareth, “The Frox Digital Audio System,” *Proceedings of the International Computer Music Conference* (San Jose), San Francisco: International Computer Music Association, 1992.
5. Todd, P. and Loy, Gareth, eds., *Music and Connectionism*, Cambridge: MIT Press, 1991.
6. Loy, Gareth, “Composing with computers — a survey of some compositional formalisms and programming languages for music,” *Current Directions in Computer Music*, Max Mathews, John Pierce, eds., Cambridge: MIT Press, 1990.
7. Loy, Gareth, “On the scheduling of parallel processors executing synchronously,” *Proceedings of the International Computer Music Conference*, San Francisco: International Computer Music Association, 1987.
8. Loy, Gareth, “Whither MIDI,” *Computer Music Journal*, 11(1): 9-12, 1987.
9. Loy, Gareth, “Designing a computer music workstation from musical imperatives,” *Proceedings of the International Computer Music Conference*, San Francisco: International Computer Music Association, 1986.
10. Loy, Gareth, “Player — an experimental music composition language with real-time capabilities,” Technical Memorandum, UCSD: Center for Music Experiment, 1986.
11. Loy, Gareth and Abbott, Curtis, “Programming languages for computer music synthesis, performance, and composition,” *ACM Computing Surveys*, 17(2), June, 1985.
12. Loy, Gareth, “Programming languages for computer music synthesis, performance, and composition,” *ACM Computing Surveys*, 17(2), June, 1985. Also published in Japanese by the *ACM Computing Surveys* in Bit.
13. Loy, Gareth, “About AUDIUM: an interview with Stanley Shaff,” *Computer Music Journal*, 9(2): 41–48, 1985.
14. Loy, Gareth, “Musicians make a standard: the MIDI phenomenon,” *Computer Music Journal*, 9(4): 8–26, 1985.
15. Loy, Gareth, “Curtis Roads and John Strawn, editors: Foundations of computer music,” *Computer Music Journal*, 9(3): 80–81, 1985.
16. Loy, Gareth, “Designing an operating environment for a real-time performance processing system,” *Proceedings of the International Computer Music Conference* (Vancouver), San Francisco:

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- International Computer Music Association, 1985.
17. Loy, Gareth, "MIDI: a critical overview," Acoustical Society of America, Invited paper for Musical Acoustics III: Real-Time Music Synthesizers, Abst.: *JASA Suppl.* 77(1): S74, 1985.
 18. Loy, Gareth, "Computer music research using SUN workstations at the Computer Audio Research Laboratory," SUN Users Group Los Angeles, SUN Users Group, Palo Alto, CA, 1985.
 19. Loy, Gareth, "Player — extensions to the C programming language for parallel processing run-time music synthesis control," Proceedings, MIDISOFT, San Francisco, 1984.
 20. Loy, Gareth, "Allen Strange: Electronic music — systems, techniques, and controls, 2nd edition," *Computer Music Journal*, 7(4): 60–61, 1983.
 21. Loy, Gareth, "An experimental music composition language with real-time capabilities," *Proceedings of the International Computer Music Conference* (Rochester), San Francisco: International Computer Music Association, 1983.
 22. Loy, Gareth, "Applications of digital signal processing in computer music," Acoustical Society of America, Invited paper, Special Plenary Session: Applications of Signal Processing in Acoustics, Abst., *JASA Suppl.*, 74(1): S36, 1983.
 23. Loy, Gareth, "The composer seduced into programming," *Perspectives of New Music*, 19(1): 184–198, 1982.
 24. Loy, Gareth, "A sound file system for UNIX," *Proceedings of the International Computer Music Conference* (Venice, Italy), San Francisco: International Computer Music Association, 1982.
 25. Loy, Gareth, "System design for computer music at the Computer Audio Research Laboratory, UCSD," IEEE 1982 Region VI Conference, Invited paper for the session on Computer Systems and Applications, San Diego, 1982.
 26. Loy, Gareth, "Notes on the implementation of MUSBOX, a compiler for the Systems Concepts Digital Synthesizer," *Computer Music Journal*, 5(1): 13–33, 1981.
 27. Loy, Gareth, *Nekyia*, Stanford University Department of Music DMA thesis, Ann Arbor, Michigan: University Microfilms, 1980.
 28. Loy, Gareth, "Systems Concepts Digital Synthesizer operations manual and tutorial," Stanford University Report STAN-M-6, Stanford University: Department of Music, 1980.
 29. Loy, Gareth, "Sonic landscapes, electronic and computer music by Barry Truax, and Studies for trumpet and computer by Dexter Morrill," *Computer Music Journal*, 2(1): 60–61, 1978.
 30. Loy, Gareth, "New directions in music — Significant contemporary works for the computer," *Computer Music Journal*, 2(4): 6–8, 1978.
 31. Loy, Gareth, "The Dartmouth digital synthesizer, electronic music by Jon Appleton, Lars-Gunnar Bodin, Russell Pinkston & William Brunson," *Computer Music Journal*, 1(2): 61, 1977.
 32. Loy, Gareth, "Studio report, CCRMA, Stanford University," *Proceedings of the International Computer Music Conference* (UCSD), San Francisco: International Computer Music Association, 1977.
 33. Loy, Gareth, "The all-digital recording studio at Stanford University," *Proceedings of the International Computer Music Conference* (MIT), San Francisco: International Computer Music Association, 1975.

Recent Lectures

2006 "The Grand Story of Musical Scales." Tutorial presented to the Audio Engineering Society convention, San Francisco, August, 2006.

Gareth Loy, DMA – Curriculum Vitae

- 2007 “A Brief History of Musical Scales.” Lecture presented to the Ear Club, Psychology Dept., University of California, Berkeley, February, 2007.
- 2007 “Musical Scale Builders — the First Psychoacousticians.” Lecture presented to the Hearing Seminar, Center for Computer Research in Music and Acoustics (CCRMA), Stanford University, Stanford, CA, May, 2007.
- 2007 “Music, Expectation, and Information Theory.” Lecture presented to the Music and Human Behavior conference, Stanford Graduate Summer Institute 2007 (SGSI07) held at CCRMA, Stanford University, Stanford, CA, facilitated by Vinod Menon and Jonathan Berger, September 2007.
- 2007 “Information Theory and Expectation in Music.” Lecture presented to the NSF Integrative Graduate Education and Research Traineeship Program (IGERT) seminar series at UCSB, November 30th, 2007, facilitated by Stephen Travis Pope and Curtis Roads.