

Matthew Chaboud

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PROFILE

Thirteen years of experience in the design and development of shipping commercial software. Six years of experience working closely with processor vendors on micro-architectural optimization. An ongoing desire to solve difficult problems and create innovative tools.

QUALIFICATIONS

- Comprehensive understanding of image and video processing techniques and technologies and their applications to professional film and video.
- Experience with low-latency audio system design and architecture.
- Extensive C and C++ development experience.
- Experience with core Microsoft technologies including inter-process COM, kernel and virtual memory, ATL, C#, and DirectX.
- Experience leveraging optimization techniques and technologies including OpenMP, SIMD, and Cell processor optimization.
- Strong understanding of user-interface design principles and frameworks, from system-specific standards to custom user-interface elements.
- Experience with a wide range of software technologies including OpenGL, Qt, html+css, Objective-C, STL.
- Practical application experience with a wide range of discrete numerical techniques including dynamic programming, Fourier analysis, computational geometry, 3D transformation, convolution (first and N-order), adaptive diffusion, IIR and FIR filtering, and optimization.

EXPERIENCE

Senior Principal Engineer **Avid, Daly City, CA** **2009-Present**

- Senior system software development for VENUE Live Sound Mixing consoles.
- Responsible for all aspects of system software life-cycle, from research to deployment.
- Architected distributed automated test system.
- Lead mixed teams of local and contract developers and testers.
- Re-architected installer and deployment software and processes.

Software Design Engineer **Sony Creative Software, Madison, WI** **2003-2009**

- Lead x64 port of flagship application Vegas Pro, requiring inter-process COM, an inter-architectural (x86 and x64) memory and object architecture, and a top-to-bottom rewrite of the company-wide file I/O architecture.
- Optimized Vegas Pro rendering and playback performance for video, leveraging both micro-architectural (ASM and SSE) and multi-processor techniques. This led to the inclusion of Vegas in the BAPCo performance testing suites, which greatly strengthened SCS's working relationships with Intel and AMD.
- Designed and implemented key user-interface elements and improvements in Vegas Pro and ACID Pro, including multi-level compositing (Vegas) and groove-mapping (ACID, USPTO Patent No: 7525036).
- Mentored junior and intern developers on projects including CUDA (nVidia) optimization, non-linear video filtering, user-interface design, architecture, and language fundamentals.
- Researched and implemented experimental emerging video features internally including multi-point feature-tracking, adaptive diffusion, temporal noise reduction, and Fourier video analysis.
- Designed and implemented ongoing video rendering engine revisions for Sony Vegas Pro including floating-point processing, software 3D compositing, and multi-processor optimization.
- Aided in the re-design of software copy-protection tools and protocols and supplied key numerical tools (primality testing, elliptic root finding, arbitrary-precision library).

Software Engineer**MJ Bioworks, Sauk City, WI****2002-2003**

- Created a software-only rendering engine for 3D data visualization. This full-featured engine incorporated programmable shaders, a-buffer rendering, and automatic view-based object instancing into a C++ template-based library specifically targeted at scientific visualization on a wide-range of platforms.
- Developed an inter-process data-acquisition and analysis framework capable of operating between Windows, Linux, and embedded systems for use in computational microbiology.
- Designed and implemented algorithms for slab-gel electrophoresis analysis and real-time PCR. These relied primarily on non-linear optimization, pattern-recognition, clustering, and dynamic programming techniques.

Software Design Engineer**Sonic Foundry, Madison, WI****1998-2001**

- Developed professional media tools for Windows including Vegas, ACID, and Sound Forge.
- Developed components and architectures for a shared application framework used by all company software applications, requiring all shared code to remain shipment-ready
- Designed and implemented components of the original Vegas Pro video architecture with principle responsibility for the effects and compositing internals.
- Designed and implemented image and video processing algorithms for real-time video and film editing and compositing including specialized operations (e.g. difference-mapping) and high-performance common-use operations (e.g. scaling, rotation, multi-resolution filtering, temporal resampling).
- Developed image-processing and analysis tools for high quality compression pre-processing including inverse-telecine, adaptive noise reduction, color-gamut mapping, and scene-change detection for Sonic Foundry Media Services division.

Undergraduate Researcher**Applied Superconductivity Center - University of Wisconsin, Madison, Madison, WI****1998**

- Developed custom image processing tools for research with high-temperature superconductors (Yttrium-Barium-Copper-Oxide).
- Developed portable tools (DEC-Unix, Windows NT) for inversion of magnetic field readings, yielding images of current density (Biot-Savart inversion).

EDUCATION**University of Wisconsin, Madison, Madison, WI — Physics and Materials Science****1996-1998**

REFERENCES

Available upon request.