NIKLAS HAAS

Senior Software Engineer — Multimedia Systems & Video Processing Expert

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Professional Summary

Multimedia systems engineer with nearly 20 years of programming experience and 7+ years developing video processing infrastructure used by billions. Technical committee member for FFmpeg (2600+ companies) and VideoLAN (5B+ downloads), directly shaping the technology behind modern video delivery and media playback. Author and maintainer of libplacebo, the industry-leading open-source GPU color management and video processing library. Deep expertise in video codecs, HDR workflows, color science, GPU-accelerated media processing, and real-time video rendering. Proven track record implementing novel algorithms for tone mapping, upscaling, and color management.

Core Competencies

- **Video Processing & Codecs:** Expert-level knowledge of modern video codecs and processing pipelines; developed first open-source implementations of Dolby Vision and other critical video technologies; deep understanding of video compression, filtering, and transcoding workflows
- **Color Management & HDR:** Comprehensive expertise in color science, HDR workflows, tone mapping algorithms, and color space transformations; implemented production-grade color management systems used by millions
- **GPU-Accelerated Media Processing:** Vulkan and OpenGL expert; designed and implemented GPU compute pipelines for real-time video processing, achieving 10x+ performance improvements; author of libplacebo, industry-leading GPU video processing framework
- **Multimedia Algorithm Design:** Developed novel perceptually-motivated algorithms for tone mapping, upscaling, and image enhancement; expertise in signal processing and psychovisual modeling
- **Performance Optimization:** Achieved 5x-10x improvements through SIMD programming, GPU acceleration, and algorithmic innovation; expert in profiling and tuning multimedia workloads
- **Technical Leadership:** FFmpeg and VideoLAN technical committee member; mentorship, design reviews, cross-company collaboration; technical decision-making for projects processing billions of videos daily

Professional Experience

Independent Consultant

January 2024 — Present

Self-employed · Full Time

- Specialized consulting on video processing systems, codec integration, color management pipelines, and multimedia algorithm development
- Led complete rewrite of FFmpeg's pixel format conversion system (libswscale), a critical component for video transcoding and format conversion used by every major streaming platform; achieved 4-5x average speedup through novel approach combining SIMD optimization with runtime code generation

Senior Software Engineer *2021 — Present*

FFlabs SAS · Remote

- Core developer for FFmpeg, the foundational video processing library used by 2600+ companies including Meta, Google, Netflix; direct impact on infrastructure processing billions of videos daily
- Authored first open-source implementations of critical video technologies including Dolby Vision HDR metadata and tone mapping, film grain synthesis, and multiview video codecs
- Developed and published novel perceptually-motivated tone-mapping algorithm combining real-time HDR frame analysis with psychovisual models; adopted by VLC, mpv, and other major media players
- Led architectural redesign of FFmpeg's format negotiation system to support advanced color spaces and HDR metadata propagation across complex filtering pipelines
- Technical mentorship through code reviews focusing on video processing correctness and multimedia best practices; 50+ substantial reviews annually

Software Engineer *2018 — 2021*

Videolabs SAS · Remote

- Created and maintain libplacebo, the industry-leading open-source GPU video processing library integrated into VLC (5B+ downloads), mpv, and FFmpeg; powers real-time HDR video playback for millions of users worldwide
- Designed and implemented complete GPU-accelerated video rendering pipeline using Vulkan, supporting HDR tone mapping, color space conversion, upscaling, and film grain synthesis; achieved 10x+ performance improvements
- Developed advanced perceptually-motivated algorithms for HDR-to-SDR tone mapping with dynamic scene analysis and high-quality video upscaling
- Led end-to-end integration of Vulkan-based GPU video output in VLC, bringing support for HDR and wide color gamut displays; feature used by 50M+ monthly active users
- Contributed GPU driver fixes to Mesa/AMD stack improving video playback stability for Linux users

Software Engineer *2018*

Pebbles Digital Media · Contract · Remote

- Developed GPU-accelerated Vulkan rendering backend for multimedia applications with real-time video compositing
- Integrated libmpv video player engine providing advanced playback control, format support, and hardware decoding

Technical Skills

Video & Multimedia: Video codecs (H.264, HEVC, AV1, VP9), FFmpeg, multimedia processing pipelines, video transcoding, format conversion, codec integration

Color Science: HDR workflows (Dolby Vision, HDR10+), tone mapping algorithms, color space transformations, ICC profiles, perceptual color models

GPU Video Processing: Vulkan (expert), OpenGL, compute shaders, GPU pipeline optimization, real-time rendering, hardware video decode/encode

Signal Processing: Image and video filtering, upscaling algorithms, psychovisual modeling, film grain synthesis

Performance Engineering: SIMD optimization (SSE, AVX2, AVX512, RISC-V), assembly language, profiling and benchmarking

Programming Languages: C (expert), GLSL/HLSL (shaders), Assembly (x86/RISC-V), Haskell, Python, Lua, Go, C++

Systems: Linux, threading/concurrency for multimedia, memory management, GPU drivers

Tools & Infrastructure: Git, GDB, GCC/LLVM, Meson, FFmpeg tooling

Leadership: Technical writing, conference speaking, cross-company collaboration, open-source community coordination

Education

Bachelor of Science in Computer Science
Ulm University, Germany 2014 — 2019
Graduated with highest honors

Honors & Awards

- **Landessieger Mathematik & Informatik** (State Winner), Jugend Forscht Baden-Württemberg 2013
  Project: Developed a Haskell library using type system metaprogramming to automatically track and verify physical units throughout computations, preventing dimensional analysis errors at compile time

Additional Information

- **Languages:** German (native), English (native), Norwegian (B2)
- **Location:** Currently based in Germany, open to relocation (e.g. Dublin, Zurich, Munich)
- **Work Authorization:** EU citizen (German)