WAHAJ ASLAM

Senior Audio DSP Engineer | Audio Codec Specialist | MPEG Audio Standards

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Nürnberg, Germany (Permanent Residence)

SUMMARY

Senior Audio DSP Engineer with 8+ years of experience developing advanced audio codecs for real-time and streaming applications used by major global partners. Strong background in audio signal processing and perceptual coding, with hands-on contributions to MPEG standards including xHE-AAC, MPEG-H 3D Audio, and AAC. Focused on turning research concepts into robust, production-quality C/C++ implementations, with emphasis on performance, audio quality, and long-term maintainability.

TECHNICAL EXPERTISE

- **Audio Codec & DSP:** Audio coding algorithms, audio processing pipelines, perceptual models, speech & audio processing/compression, bandwidth extension, source localization, beam-forming, STFT, LPC analysis, psychoacoustics, immersive audio, quality tuning, artifact
- **Programming & Systems:** C, C++, Python, Bash, embedded Linux, multithreading/concurrent programming, OOP, performance optimization, real-time systems
- **Embedded Systems:** Embedded C/C++, ARM Cortex-M, DSP on embedded targets, mbedOS, memory-constrained systems, cross-compilation, hardware/software integration
- **Frameworks & Tooling:** FFmpeg, Adobe Audition, sox, JUCE, VST, Ableton, Windows Media Foundation, MATLAB, Pure Data, PortAudio, iOS CoreAudio, CMake, Git, GitLab CI/CD, Visual Studio, Xcode, Jira, Scrum
- **Python & Scientific Computing:** NumPy, SciPy, librosa, matplotlib, Jupyter
- **AI / ML (Independent):** PyTorch, Spatial transformer training, RAG

PROFESSIONAL EXPERIENCE

Senior Engineer – Audio Codec Development

Fraunhofer IIS, Erlangen | Mar 2023 – Present

- Led the technical design and implementation of new codec tools from research to deployment
- Architectural contributions related to low-latency, adaptive streaming, and scalable encoding frameworks
- Performance and complexity optimization on ARM and x86_64 platforms
- Integration and validation within FFmpeg and Windows Media Foundation pipelines
- Long-term maintenance, testing, and regression analysis for production codebases

Scientific Researcher – Audio Signal Processing

Fraunhofer IIS, Erlangen | Apr 2018 – Feb 2023

- Development and maintenance of core audio coding components in xHE-AAC, MPEG-H 3D Audio, and AAC encoders
- Research on audio and speech coding algorithms including bandwidth extension and signal reconstruction
- Algorithm design and evaluation using MATLAB, Python and C

- Objective and subjective evaluation using MUSHRA listening tests
- Collaboration with engineering teams to assess feasibility for production integration

Audio DSP Engineer – Research Internship

Fraunhofer IIS, Erlangen | Mar 2015 – Nov 2016

- Implementation of MPEG-H audio coding tools in C and MATLAB
- Development of multichannel coding tools using time-differential techniques
- Evaluation of bitrate efficiency and perceptual quality

Software Engineer – Embedded LTE/4G Protocol Stack

u-blox, Pakistan | Jul 2012 – Aug 2014

- Development of LTE/4G NAS-layer components according to 3GPP Releases 9–11
- Implementation of AT command handling and USIM modules in embedded C
- Customization of protocol stack components for embedded devices
- Protocol verification using Anite conformance tools

PATENTS

- **WO2023021137A1 (Granted & Published)** – Audio encoder and method for providing an encoded representation of audio information

EDUCATION

M.Sc. Information & Communication Engineering
Technical University of Darmstadt, Germany | Sept 2014 – Sept 2017

B.Sc. Telecommunication Engineering
National University of Computer & Emerging Sciences (FAST-NU), Pakistan | Sept 2008 – May 2012

LANGUAGES

English – Fluent | German – B1 | Urdu – Native

INTERESTS

- Audio signal processing beyond production work, exploratory use of machine learning for audio analysis
- Exploring applications of AI, DSP, and multi-agent architectures
- Modern design trends
- Team sports, cycling, hiking and cricket