

# WAHAJ ASLAM

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

[linkedin.com/in/wahaj-aslam](https://www.linkedin.com/in/wahaj-aslam) | <https://wahajaslm.github.io/portfolio> | [wahajaslam08@gmail.com](mailto:wahajaslam08@gmail.com) | +49 176 56968258

Nürnberg, Germany (Permanent Residence)

## SUMMARY

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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

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- **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

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### 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 | Dec 2016 – Mar 2017*

- 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**

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

## **EDUCATION**

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### **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**

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English – Fluent | German – B1 | Urdu – Native

## **INTERESTS**

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- 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