

Richard Mitic

Senior engineer and researcher with 10 years experience specialising in audio, signal processing, embedded programming, and streaming media

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Experience

Spotify, Stockholm, 2016 - present

A multitude of projects centred around audio/video files, embedded programming, and research

Languages and tools:

- C, Rust, Python, C++, Java, Scala, Javascript
- Git, CMake, FFmpeg, Pyav, Docker, BigQuery, Dataflow, Xcode, Android NDK, Alsa, AndroidAudio, QT, CoreAudio

Media Tech Researcher/Engineer, June 2022 - present

PhD research project with Mälardalens Universitet investigating the stereo images of recorded music

- Invention of signal processing techniques to quantify the stereo image of music
- Analysis of large cohorts of tracks via machine learning to find interesting features, trends, clusters, and general oddities
- Use of "big data" frameworks to perform DSP efficiently at scale
- Advising the company on how to maximise audio quality

C/C++/Rust Engineer, March 2021 - June 2022

Audio/video transcoding and media analysis tools

- Audio and video transcoding systems that run efficiently at the scale of Spotify
- Analysis tools for compressed media files and signal processing of their uncompressed counterparts
- Customisation of open-source tools (ffmpeg, pyav)
- Proprietary audio and video encoding tools
- Analysis of weird and wonderful broken media files and parsers

Senior Engineer, April 2017 - March 2021

Spotify-branded hardware products (e.g. Car Thing)

- Embedded voice control SDK
- Real-time safe audio playback, mixing, and recording for embedded Android
- Noise cancellation in microphone signals
- Android, Linux, and QT applications for audio playback, voice control, user interface, and over-the-air updates

Developer, March 2016 - April 2017

Spotify Connect embedded playback library (eSDK)

- Customisation and development of eSDK for various hardware partners (most notably Sonos)
- Automated testing of hardware products

Ericsson Research, Stockholm, 2013 - 2016

Experienced Researcher in Visual Technology, primarily focusing on MPEG DASH and WebRTC

- Developed audio/video streaming algorithms that were approved for patents
- Built test suites for MPEG-DASH, encompassing content generation and consumption
- Developed several media-file-related frameworks and applications internal use and external demonstration
- Built a head-mounted display video renderer module for OpenWebRTC
- Analysed and categorised delays in DASH media chains
- Contributed to the standardisation of DASH and the MPEG File Format

Languages and tools used:

- Python, C, Javascript
- Visual Studio, Gstreamer, OpenGL

Dolby Laboratories, Nürnberg, 2012

Intern in audio compression software engineering

- Created bitstream analysis tools for a proprietary audio codec
- Contributed to the corresponding bitstream encoder
- Implemented bug fixes for in-house development tools

Languages and tools used:

- C, Python
- Visual Studio, Perforce

Education

Mälardalens Universitet, SE, 2022-present

Doctoral Candidate, licentiate expected 2026

Overarching research question:

How can content-based information retrieval in vast repositories of audio and music be supported through signal processing, signal analysis and artificial intelligence methods?

University of Glasgow, UK, 2008-2013

Master of Engineering in “Electronics with Music” with First Class honours

- Selected modules
 - Audio Programming
 - Audio and Video Processing and Encoding
 - Data Acquisition for Musical Processing
 - Real-time Embedded Programming
 - Acoustics
 - Mathematics
 - Sonic Arts
- Selected projects
 - Automated image acquisition of nanopattern cell cultures using an optical microscope
 - Music visualisation software
 - Live music performances using Max/MSP
 - Non-contact temperature sensors for racecar tyres
- Honours and awards
 - IET Prize for outstanding academic achievement, 2013
 - Highest GPA in music department, 2011
 - Excellence in Electronics bursary, 2010/11
 - Engineering Excellence list, all semesters
- Extracurricular
 - Lead tenor saxophonist in Big Band
 - Founding member of Contemporary Music Ensemble
 - Webmaster for Filmmaking Society.

Other

Languages spoken: Native English, Basic Swedish, Basic German

Music: <https://soundcloud.com/richardmitic>

Code: <https://github.com/richardmitic>

References available on request