Dr.-Ing. Nils Werner

Personal Information

Email	nils@hey.com
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Phone	+49 178 683 0197
DOB	February 22, 1986
Hometown	Erlangen, Germany
Citizenship	German

Skills

Software Eng.	Python, C, C++, Rust, FFI, CUDA, OpenGL, Qt, SciPy, MATLAB, R, PyTorch, Tensorflow, PHP, SQL, XSLT, Bash, Git, JavaScript, Vue.js, Unit Testing, TDD
IT	Linux, Tooling, Kubernetes, Slurm, DevOps
DSP	Multimedia Signal Processing, Time/Frequency Transforms, Psychoacoustics, Parameter Estimation, Compressed Sensing, Audio Compression, Video Compression
Research	Teaching, Study Design, Visualization, Statistical Analyses, Publishing
Soft Skills	Active Listening, Problem Solving, Communicating Complex Problems, Forward Thinking, Technology Scouting
Languages	German, English, French

Work Experience

2022–2023 **Sabbatical Leave**

- Travelled
- Took time for personal reflection
- Learned Rust programming language

2021–2022 **University of Erlangen-Nürnberg** — Postdoctoral Research Scientist

- Researched and developed a toolkit to simulate acoustic sensor networks
- Researched psychacoustically weighted reconstruction of compressive sensing signals
- Mentored colleagues in the use of modern MLOps, DevOps and HPC tools

2020–2021 **Fraunhofer IIS** — Research Scientist

- Consulted in the architectural design of a cloud based speech processor

2014–2020 **University of Erlangen-Nürnberg** — Research and Teaching Assistant

- Researched an optimized filterbank for audio compression algorithms
- Modernized software development workflows and tooling for research
- Designed and maintained laboratory's IT infrastructure and software services
- Spearheaded transition from MATLAB to Python

2012–2013 **Fraunhofer IIS** — Research Intern

- Developed a library and GUI for spatial audio experiments in C++

2005–2014 **Entrepreneurship** — Co-Founder

- Developed full stack websites
- Contributed to open source software projects

2003/2005 **Schaeffler AG** — Student Assistant

- Developed industrial machine control software in C
- Developed predictive maintenance software in Java and MySQL

Education

Dr.-Ing. 2014–2020	**University of Erlangen-Nürnberg** — *Summa Cum Laude* Doctoral Thesis: “Lapped Nonuniform Orthogonal Transforms with Compact Support”. Supervisor: Prof. Dr.-Ing. Bernd Edler.
Dipl.-Ing. 2005–2014	**University of Erlangen-Nürnberg** — Information and Communication Technologies Diploma Thesis: “Parameter Estimation for Time-Varying Harmonic Audio Signals”. Supervisor: Dr.-Ing. Fabian-Robert Stöter. Study Thesis: “A Recursive Algorithm for Sound Synthesis on GPU Hardware”. Supervisor: Prof. Dr.-Ing. Rudolf Rabenstein.

Other Contributions

Open Source	Top 1% StackOverflow Contributor, 30+ Open Source Repositories, 170+ Open Source Contributions
Reviewer	IEEE, Journal of Open Source Software, and Web Audio Conference

Tutorials/Invited Talks/Interviews

Invited Talk	“An Introduction to Audio Signal Compression”, INRIA, Montpellier 2019
Interview	“Data Transmission on the Internet”, YouTube Channel “Physics Girl” (2M+ subscribers)
Tutorial	“Multimedia Signal Processing in Python”, Fraunhofer Student Summer Camp 2015, 2016, 2017

Selected Publications

Papers

N. Werner and B. Edler, “Nonuniform orthogonal filterbanks based on mdct analysis/synthesis and time-domain aliasing reduction,” *IEEE Signal Processing Letters*, vol. 24, no. 5, pp. 589–593, May 2017.

——, “Time-varying time-frequency tilings using non-uniform orthogonal filterbanks based on mdct analysis/synthesis and time domain aliasing reduction,” *IEEE Signal Processing Letters*, vol. 26, no. 12, pp. 1783–1787, Dec. 2019.

——, “Perceptual audio coding with adaptive non-uniform time/frequency tilings using subband merging and time domain aliasing reduction,” in *Proceedings of the IEEE 2019 International Conference on Acoustics, Speech and Signal Processing*, 2019.

——, “Experimenting with lapped transforms in numerical computation libraries using polyphase matrices and strided memory views,” in *Proceedings of the Audio Engineering Society Convention 146*, Mar. 2019.

Patents

N. Werner and B. Edler, “Time domain aliasing reduction for non-uniform filterbanks which use spectral analysis followed by partial synthesis,” WO Patent WO2 018 019 909A1, Feb., 2018.

——, “Time-varying time-frequency tilings using non-uniform orthogonal filterbanks based on mdct analysis/synthesis and tdar,” WO Patent WO2 021 037 847A1, Mar., 2021.

N. Werner, B. Edler, and S. Disch, “Perceptual audio coding with adaptive non-uniform time/frequency tiling using subband merging and the time domain aliasing reduction,” WO Patent WO2 020 083 727A1, Apr., 2020.

Interests

Hobbies	Sailing, Drumming, Cycling, Photography, Cooking, Meditation