

Patrick Marmaroli

Freelance

Audio Signal Processing, Machine Learning & Fullstack Dev

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PROFESSIONAL SUMMARY

Signal processing engineer with a PhD from EPFL, 15+ years of experience, and 30+ publications and 3 patents. Full-stack developer covering DSP, machine learning, frontend, backend, cloud infrastructure and databases end to end, using an AI-assisted development workflow that keeps the same engineering rigor while moving faster than a traditional single-discipline developer. Freelancing full-time since August 2026 through Hidacs Sàrl (custom software & R&D consulting — audio & acoustic signal processing, machine learning, enterprise business software) and Vocametrix (speech-therapy audio analysis and games platform).

WORK EXPERIENCE

CEO & Co-Founder

Oct 2023 — Present

[Vocametrix OÜ](#) · Tallinn, Estonia

- Designed and deployed a speech-therapy web platform combining pronunciation assessment, pitch tracking, and gamified voice exercises, backed by a full speech-processing API suite serving both the platform and external developers.

Founder

Feb 2016 — Present

[Hidacs Sàrl](#) · Lausanne, Switzerland

- R&D consulting in signal processing, machine learning, and web development — feasibility studies, proof-of-concepts, and prototyping for speech, industrial, environmental, and health applications.

Senior Audio Engineer

Jan 2022 — Jul 2026

[Microsoft \(Skype/Teams\)](#) · Tallinn, Estonia

- Developed PyTorch-based audio quality models for evaluating audio signals quality across diverse acoustic environments.
- Designed automated tools for large-scale audio and video data analysis, generating comprehensive evaluation reports.
- Conducted acoustic laboratory measurements and experimental validation to support research on audio conferencing quality.

Audio Signal Processing Consultant

Oct 2021 — Dec 2021

[Onfido](#)

- Developed an anti-spoofing technology using ultrasound for identity-verification liveness detection.

Research Engineer (part-time)

Jul 2020 — Sep 2021

[HEPIA \(HES-SO Geneva\)](#) · Geneva, Switzerland

- Contributed to the "EARSSENS" research project, developing signal processing algorithms to repurpose loudspeakers as safety sensors for privacy-preserving indoor activity detection.
- Co-authored "Towards the detection and classification of indoor events using a loudspeaker," published in Applied Acoustics (January 2023).

- Contributed to the acoustic design and testing of audio devices, focusing on noise reduction and echo cancellation.
- Developed custom acoustic test benches and technical specifications, ensuring high-fidelity performance in complex sound environments.
- Built and led a team of 4 engineers from the ground up, steering signal processing algorithms from initial prototype to validated product.

Project Manager, R&D Acoustics Department
PRONA SA · Yverdon, Switzerland

Sep 2014 — Jun 2016

- Developed custom Matlab pipelines to streamline RT60, STC, and NRC data processing, increasing the efficiency of building and environmental acoustic audits.
- Conducted on-site normative acoustic measurements and authored technical reports ensuring compliance with international standards.
- Managed multidisciplinary acoustic consulting projects for industrial, institutional, and private clients.

Post-Doctoral Fellow
EPFL · Lausanne, Switzerland

Mar 2013 — Oct 2014

- Designed audio signal processing algorithms and conducted laboratory and field experiments within European research projects.
- Collaborated with industrial partners including Phonak (hearing aids), FIAT, and ARMASUISSE.
- Supervised interns and PhD students, contributed to scientific publications, and coordinated with international teams.

EDUCATION

PhD, Acoustics & Audio Signal Processing 2008 — 2013
EPFL · Lausanne, Switzerland

Thesis: Bimodal Sound Source Tracking Applied to Road Traffic Monitoring

Master Thesis in Signal Processing 2007 — 2008
Université du Sud Toulon-Var · France

Signal processing, psychoacoustics, and trajectography

Software Engineering Degree 2005 — 2007
ISEN Toulon · France

SKILLS

Core: Signal Processing & ML · DSP & Acoustic Measurement · Full-Stack Web Dev · AI-Assisted Development

Audio & DSP: MATLAB, Web Audio API, FFT Analysis, GCC-PHAT, HRTF

AI & ML: PyTorch, Scikit-learn, OpenAI GPT-4, YAMNet, Azure Cognitive Services

Web & Cloud: React, Next.js, Node.js/Express, Azure, PostgreSQL, Docker, CI/CD

Security: AES Encryption, Privacy-Preserving AI, GDPR Compliance

LANGUAGES

French: Native

English: C1 Advanced

PERSONAL INFORMATION

Nationality: French

Married, 6 children

Based in France, Annecy / Geneva border area