Stephane Dedieu, *PhD*

Ottawa Ontario Canada
+1(613) 406 - 2840
stephane.dedieu@bloo-audio.com https://www.linkedin.com/in/sdedieu/ https://www.bloo-audio.com/

Founder, owner of Bloo Audio Inc.
Bloo Audio Inc.'s expertise leverages more than 25+ years of experience in scientific modeling and computing, numerical analysis (FEM/BEM) in acoustics & vibrations, advanced R&D in Digital Signal Processing algorithms (microphone arrays, beamforming, speech enhancements), sensors & audio signal acquisition & analysis. And audio product development.
Certified in Data Science (IBM Skills Network), Bloo Audio Inc. now develops Deep Learning and Machine Learning models for Signal Processing applications and original features for signals classification problems.

General Skills

- Business development – Partnership
- Communication with clients
- Leadership - Technical Lead
- Audio Product development
- Research and Development
- Innovation - Transfer of Technology
- Complex Problems Solving
- Critical Thinking
- Mathematical Reasoning

Expertise

- Acoustics & Vibrations, Electroacoustics: simulations, design, tests, validations.
- Digital Signal Processing algorithms development (Matlab, Python).
- Speech Enhancements advanced algorithms: Beamforming, Noise Reduction, Filters, VAD, SSL.
- Signal analysis: FFT, STFT, Mel-Spectrogram, Wavelets, Synchrosqueezing.
- Machine and Deep learning for Digital Signal Processing applications.
- Data Analysis

Technical Skills

Languages/Simulation: Matlab/Octave, Python, C, LaTeX - COMSOL (BEM/FEM)
Signal Acquisition HW: Microphones, Accelerometers, Ear simulators, HATS, Bruel&Kjaer test equipment
Signal Analysis: AudioPrecision, ARTA, TrueRTA, AdobeAudition, Audacity
Audio Standards: ITU - TIA, AES, IEC, 3GPP. PC 2001, AES 6-id.
Data Science tools: Pandas, NumPy, Scipy, Scikit-Learn, Keras, TensorFlow, Librosa, Matplotlib, Plotly, Seaborn, Beautiful Soup, Folium, Jupyter Notebook
Mathematics: arithmetic, algebra, geometry, calculus, probability, statistics, optimization, Fourier & wavelets analysis, inductive/deductive reasoning

Experience

Bloo Audio Inc. **Since 2013**
Founder Owner *Ottawa, ON Canada*

Advanced R&D Projects:

- 10/2024 - 04/2025 **Google Waterloo & Mountain View - AR glasses & VR headset**
  -BEM simulations with COMSOL - Optimization of arrays microphones positions with GAs
  -MVDR, LCMV Beamforming - Harmonics for Ambisonics
- 07/2023 - 01/2024 **Google Waterloo - Augmented Reality glasses**
  -Optimization of microphone arrays & beamforming for AR glasses based on HATS BEM simulations (COMSOL).
  -Assisted with the experimental set-up, signals acquisition, analysis, validations

-Developed low complexity NR algorithms: GSC Multichannel Wiener, Ephraim-Malah, TSNR-HRNR, LGSA
-Speech Activity Detection (Deep Learning) for testing NR algorithms
-Low complexity Sound Source Localization algorithm (SSL - Machine Learning)

- Since 2021 **Machine Learning, Deep Learning applied to Digital Signal Processing**
  In-house R&D: Developed advanced transforms (based on STFT, Wavelets) for improving accuracy of signals classification models. Projects: Environmental Sound Classification,MIMII Valve Sound defect detection,Genome Classification.
- 2015 & 2023 **Binaural Beamforming - Initially with EERS Montreal**
  GSC Beamforming in highly noisy environments.
- 2018-2020 **Mircom Vaughan - Optimization of WLAN Networks' resources allocation**
  Genetic Algorithm & bin-packing algorithms. Paper *"Network Device Allocation Optimization Using Genetic Algorithms"*

Recent Engineering Projects:

Assist and train teams of engineers to achieve excellence in acoustics/audio design, testing and certifications. Acoustics/Audio systems design, measurement and tuning: high-end full-duplex telephones&intercoms, handsets, specialty earphones, alarm devices.

- **Mircom Vaughan**
  - Low frequency sounders: FH-400-LF and FHS-400-LF. Design, definition of thorough testing procedures& validations, Bloo Audio accompanied the team towards success, to meet the very stringent certifications at the UL Labs.
  - Acoustic design, tests, and tuning speech enhancements on Codec DSP: Gains, EQ Filters, AEC, AGC, NR of all full-duplex Mircom intercoms: TX3-TOUCH-S15#, TX3-TOUCH-F22#
- **Design1st Ottawa**
  - Project underway: Designed acoustics and audio systems for The Groove Thing Bluetooth "'loudspeaker"', raising $489k on Kickstarter, optimizing TI Purepath Smart Bass/EQ for superior audio performance.
  - Acoustics/Audio design of a high end VoIP phone and a wideband noise canceling handset for trading floors

Past and current clients: Google, Mircom, Design1st, Cloud9, Wesley Clover, Fortinet, Sonomax, EERS.

Bloo Audio Inc. has a business insurance that covers: Professional Services, Technology Products and Services, Electronic Media, Network Security and Privacy Breach

novero **03/2009 – 06/2013**
Senior Acoustics/Audio Manager *Markham, ON, Canada*

- Instrumental in establishing novero R&D center in Markham.
- Lead acoustics/audio designer: audio architecture - mini-speaker, receivers, hi-fi earphones solutions for small consumer multimedia audio devices, in a fast paced multidisciplinary environment: Baseband, RF, SW, external partners (ODM, CM) and design team in Germany.
- Volkswagen: road testing and tuning full audio enhancement suite for car handsfree phones (including luxury VW Phaeton) : AEC, NR, Filtering, gains (with Novero Bochum - Germany)
- Technical lead: Bluetooth speaker/speakerphone products.
- Audio enhancements algorithms development, sourcing and testing.
- Audio standards specifications. Audio product development with emphasis on differentiation.

Private practice **11/2004 – 03/2009**
Consultant in Acoustics/Audio *Ottawa, Ontario*

Managed and led all the aspects of acoustics and audio design, tuning and testing, interfacing with design teams, vendors and Contract Manufacturers.

Main Projects:

- Battelle (OH) + NLS Library of Congress Washington: Digital talking book for the blinds.
- Humanware Montréal (QC): Digital talking book for the blinds."Victor" "Daisy" readers.
- Sonomax Montréal (QC): High-fidelity miniature earphone solution for replacing expensive MEMS driver.
- www.leapfrog.com Los Gatos: Loudspeaking pen I&II
- www.stetron.com Markham (ON): Speaker solutions for various customers

Mitel Networks **06/1999 - 09/2006**
Senior Acoustics/Audio Designer *Ottawa, ON, Canada*

- Demonstrated and validated the relevance of BEM/FEM simulations (Sysnoise/I-DEAS Vibro-Acoustics) for telephone acoustics modeling for improving sound quality and full duplex hands-free operation.
- Introduced wideband audio [150Hz-7kHz] acoustics design principles. Application to speakerphones, handsets, audio receiver
- Instrumental designer of Mitel 5310 VoIP 6 microphones beamforming conference unit (first to market with this feature 12y before Amazon Echo).
- Microphone Array & Beamforming: Team lead of a R&D project (2002-2004). Defined orientations and led the research cycle from theoretical aspects to proof-of-concepts prototypes. IP portfolio
- Instrumental in transfer of technology from the National Research Council(NRC) and from Universities. Adjunct Professor at Carleton University.

École de Technologie Supérieure **01/1998 - 05/1999**
Post-Doctoral Associate *Montreal QC Canada*

- MITEL Networks: Demonstrated and validated the relevance of BEM/FEM simulations (Sysnoise/I-DEAS Vibro-Acoustics) for telephone acoustics modeling to improve sound quality and full duplex hands-free operation.
- BRP/Ski-Doo: Measurements and Analysis of noise radiated by sprockets and track undergoing impacts in a snowmobile.

STRACO (today in ESI-Group) **05/1993 - 12/1997**
Acoustics Development Engineer *Compiègne - FRANCE*

- Software development: Contributed to the development of RAYON, a fluid-structure interaction SW based on Finite and Boundary Element Methods, today integrated in VA-One by ESI-Group.For Automotive and Aerospace applications.
- Optimized an X-LMS "feed-forward" active vibration & noise control system. Developed and validated a Finite Element model of piezoelectric actuator/sensor bonded on vibrating structures.

Education

Université de Technologie de Compiègne (UTC) **03/1993 - 12/1997**
Ph.D. in Mechanical Engineering, Numerical Analysis (FEM/BEM) applied to Acoustics/Vibrations simulations *Compiègne - FRANCE*

Université de Technologie de Compiègne (UTC) **10/1991 - 09/1992**
D.E.A. (Pre-Doc), Mechanical Engineering, Numerical Analysis (FEM/BEM) applied to Acoustics/Vibrations simulations *Compiègne - FRANCE*

Université de Picardie Jules Verne **10/1986 - 06/1991**
MSc Applied Mathematics *Amiens - FRANCE*

Additional Information

Languages

French 5/5
English 4.5/5
Spanish 2.5/5

Courses - Certifications

Data Science courses and certifications (2020-2022)
Data Science: Machine & Deep Learning portfolio (Github)