BENJAMIN O'BRIEN, PhD

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I am a data scientist, who specializes in digital signal processing and statistical modeling of time-varying signals (acoustic, behavioral, psychophysical). Some of my developments include applications for real-time auditory feedback based on human movement, pathological and paralinguistic speech production models, and deep-learning model interpretability.

SKILLS

Programming languages : Python (PyTorch, scikit-learn, shap), R, Unix, C/C++, Matlab
Digital signal processing : Max/MSP, Speech Brain, SuperCollider, Praat, DAWs
Motion Capture Systems : CodaMotion, Qualysis, Rotor
Languages : English (native), French (bilingual)

PROFESSIONAL EXPERIENCE

Research Engineer, Aix-Marseille Université, CNRS, ISM — May 2026 - Present
MixSon (ANR-24-CE38-4550)
Develop augmented-reality protocols to provide auditory feedback based on the tennis service gesture and study the effects on performance and trainer-athlete interactions (Qualysis; Python; R).

Research Engineer, Laboratoire Informatique d'Avignon, Avignon Université — Apr. 2022 - Dec. 2025

- **Explicit Voice Attributes** (ANR-18-CE23-0018) in collaboration with Orange Telecom, IRCAM
  Develop methods to explain vectors generated by speech recognition models (ANN): identify and correlate vector dimensions with acoustic features associated with the voice and set them as parameters for synthesis (Python: Pytorch, SpeechBrain; R).
- **SkyPhysIA** (Readynov2021 : CP/2021-OCT/10.04) in collaboration with Semaxone (biosignal startup)
  Develop methods to analyze and apply machine learning procedures to acoustic and biometric signals (ECG, fNIRS) for the purposes of modeling cognitive and behavioral changes (stress, hypoxia) in pilots (Matlab; Python; R).

Research Engineer, Aix-Marseille Université, CNRS, LPL — Jan. 2020 - Mar. 2022

- **VoicePersonae** (ANR-18-CE23-0018) in collaboration with EuroCom, National Institute of Informatics (JP)
  Perceptual evaluation of anonymized speech for the purposes of developing cyber-security tools and evaluation methods (Matlab; Pratt, Python; R).
- **VoxCrim** (ANR-17-CE39-0016) in collaboration with Service National de Police Scientifique
  Evaluate the effects of continuous modifications of speech characteristics and task design on automatic (deep learning models) and perceptual performance for the purposes of forensics speech (Matlab; Praat; Python, R).

Research Engineer, société Protisvalor Méditerranée — Apr. - Nov. 2019
PEPS projet
Develop augmented-reality protocols to provide real-time auditory feedback based on the pedal stroke and study the effects on expert cyclist performance (Delysys; Matlab; Max/MSP; Qualysis).

Research Engineer, Aix-Marseille Université, CNRS, ISM — Oct. 2017 - Dec. 2018
SoniMove (ANR-14-CE24-0018) in collaboration with Stellantis (PSA)
Develop augmented-reality protocols to provide real-time auditory feedback based on golf putting and swing strokes, and study the effects of sound on novice and expert golfer performance (CodaMotion; Matlab, Max/MSP; Qualysis).

EDUCATION

Masters in Acoustics Sept. 2016 - 2017
Aix-Marseille Université, Marseille, France

Ph.D in Music Composition Aug. 2010 - Aug. 2015
University of Florida, Gainesville, Florida, USA

Masters in Music Composition Sept. 2007 - June 2009
Mills College, Oakland, California, USA

Bachelors in Mathematics Sept. 2002 - May 2006
University de Virginia, Charlottesville, Virginia, USA

ARTICLES

O'Brien B and Marczyk A (2025) A spectrotemporal modulation application for distinguishing modal and whistled speech, *Int. J. Speech Technol*. doi: 10.1007/s10772-025-10185-1

Mazzocconi C, **O'Brien B**, Bodur K, et al. (2025) Do children laugh like their parents? Conversational laughter mimicry occurrence and acoustic alignment in middle-childhood, *J. Nonverbal Behavior* 49: 53–83

O'Brien B, Meunier C, Ghio A. (2024) Evaluating the effects of continuous pitch and speech tempo modifications on perceptual speaker identification performances by familiar and unfamiliar listeners, *Speech Comm*, 165(3):103145

O'Brien B, Meunier C, Tomashenko N, et al. (2023) Evaluating the effects of task design on unfamiliar Francophone listener and automatic speaker identification performance, *Multimedia Tools & Applications*

Marczyk A, **O'Brien B**, Tremblay P, et al. (2022) Correlates of vowel clarity in the spectrotemporal modulation domain: Application to speech impairment evaluation, *JASA*, 152 (5): 2675-2291

Tomashenko N, Wang X, Vincent E, et al. (2022) The VoicePrivacy Challenge: Results and findings, *Computer Speech and Language* 74(2-3): 101362

O'Brien B, Hardouin R, Rao G, et al. (2020) Online sonification improves cycling performance through kinematic and muscular reorganisations, *Scientific Reports* 10(20929): 1-12

O'Brien B, Juhas B, Bieńkiewicz M, Bourdin C. (2020) Revisiting the Nesbit and McGinnis Optimisation Model of the Golf Swing Hub Path, *J Sports Med Phys Fitness* 60(8): 1089-1100.

O'Brien B, Juhas B, Bieńkiewicz M., et al. (2020) Online sonification for golf putting gesture: reduced variability of motor behaviour and perceptual judgement. *Exp Brain Res*: 1-14.

O'Brien B, Juhas B, Bieńkiewicz M, et al. (2020) Sonification of golf putting gesture reduces movement variability in novices, *RQES*: 1-10

RECENT CONFERENCE PROCEEDINGS

Mazzocconi C, **O'Brien B**, Fourtassi, A (2024) Laughter Responsiveness and Acoustic Alignment in Parent-Child and Adult-Adult Interaction, *Proc. Laughter and Other Non-Verbal Vocalisations Workshop 2024*, 42-44

Duret J, **O'Brien B**, Esteve Y, et al. (2023) Enhancing Expressivity Transfer in Textless Speech-to-Speech Translation, *Proc. IEEE Workshop on Automatic Speech Recognition and Understanding 2023*

Mazzocconi C, **O'Brien B**, Chaminade, T. (2023) How do you laugh in an fMRI scanner? Laughter distribution, mimicry and acoustic analysis. *Proc. Disfluency in Spontaneous Speech (DiSS) Workshop 2023*, 43-47

O'Brien B, Greese, A, Billaud, J-B, et al. (2023) Differentiating acoustic and physiological features in speech for hypoxia detection, *Proc. Interspeech 2023*, 5013-5017

Ben-Amor I, Bonastre J-F, **O'Brien B**, et al. (2023) Describing the phonetics in the underlying speech attributes for deep and interpretable speaker recognition, *Proc. of Interspeech 2023*, 3207-3211

Mazzocconi C, **O'Brien B**, El Haddad K, et al. (2023) Differences between Mimicking and Non-Mimicking laughter in Child-Caregiver Conversation: A Distributional and Acoustic Analysis, *CogSci Society Conference*

O'Brien B, Meunier C, Ghio A. (2022) Evaluating the effects of modified speech on perceptual speaker identification performance. *Proc. Interspeech 2022*, 3073-3077

O'Brien B, Tomashenko N, Chanclu A, et al. (2021) Anonymous Speaker Clusters: Making Distinctions Between Anonymised Speech Recordings with Clustering Interface, *Proc. Interspeech 2021*, 3580-3584

O'Brien B, Meunier C, Ghio A. (2021) Presentation Matters: Evaluating Speaker Identification Tasks. *Proc. Interspeech 2021*, 4623-4627