Camille Bordeau

Postdoctoral researcher Qualification MCU : section 16 (psychology and ergonomy) bordeau.camille@gmail.com +33 06 81 61 67 62 Marseille, France

EDUCATION

PhD in Cognitive Psychology University of Burgundy – Thesis successfully defended on December 18 th ,2023	Graduated in 2023 Dijon, France
M.S. in Cognitive Science, specialty Neuropsychology and Clinical Neuroscience Université Lumière Lyon 2 – <i>with honours</i>	Graduated in 2020 Lyon, France
B.S. in Applied Mathematics and IT, specialty Cognitive Science Université de Bordeaux – <i>with honours</i>	Graduated in 2018 Bordeaux, France

RESEARCH EXPERIENCES

Center for Research on Psychology and Neuroscience (CRPN CNRS UMR 7077)	Marseille, France Sept 2024 - now
<u>Postdoctoral researcher</u> in the context of the DEVISE project "From novel rehabilitation protocols to visual aid systems for low vision people through Virtual Reality"	
Keywords: assistive technology, visual impairment, eccentric viewing, virtual environments	
Laboratory for Research on Learning and Development (LEAD CNRS UMR 5022)	Dijon, France Oct 2020 – Oct 2023
<u>PhD</u> supervised by Maxime Ambard and Emmanuel Bigand "Development of a visual-to-auditory sensory substitution device: study of localization performance and comparison of encoding schemes".	
Keywords : assistive technology, sensory substitution, visual impairment, perceptual learning, multisensory perception, cross-modal correspondence, spatial perception, auditory scene analysis, virtual environments.	
Lille Research Center for IT, Signal and Automatic (CRIStAL), team BCI	Lille, France Feb 2020 – June 2020
<u>Research internship</u> supervised by François Cabestaing "Power spectral density analysis of steady-state somatosensory evoked potentials" Keywords : assistive technology, brain-computer interface, motor impairment, EEG.	

Lyon Neuroscience Research Center (CRNL), team IMPACT

Research internship supervised by Claudio Brozzoli "The effects of object permanence in peripersonal space: facilitation effect of visuo-tactile integration on tactile information processing" **Keywords**: multisensory perception, peripersonal space, visuo-tactile integration.

National Institute for Research in Digital Science and Technology (Inria), team POTTIOC

Bordeaux, France Jan 2018 – May 2018

Nov 2018 – April 2019

Lyon, France

<u>College work</u> supervised by Lea Pillette, PhD student "Brain-Computer Interfaces based on motor imagery for post-stroke motor rehabilitation" **Keywords**: assistive technology, brain-computer interface, motor imagery, EEG.

EXPERTISE

Expert for organisms:

Agence Nationale de la Recherche, ANR France (1 project)

Peer-review:

Scientific Report (1 review) Psychological Research (1 review) Quaterly Journal of experimental psychology (1 review)

SCIENTIFIC COLLABORATION

Laboratory Image and Artificial Vision (ImVia) in Dijon, France. Collaboration with Florian Scalvini (PhD student in Instrumentation and Computer vision), Cyrille Migniot (Assistant professor in Computer vision), Julien Dubois (Assistant professor in Computer vision), Mathilde Vergnaud (Engineer).

Centre Monticelli Paradis d'Ophtalmologie in Marseille, France. Collaboration with Frederic Matonti (Ophtalmologist), Iliana Huyet (Optometrist).

Articles in international peer-reviewed journals

- 1. Bordeau, C., Scalvini, F., Migniot, C., Dubois, J., & Ambard, M. (*accepted*). Localization abilities with a visual-to-auditory substitution device are modulated by the spatial arrangement of the scene. *Attention, Perception & Psychophysics* https://doi.org/10.3758/s13414-025-03065-y
- 2. Carlini, A., Bordeau, C., & Ambard, M. (2024). Auditory localization : a comprehensive practical review. *Frontiers In Psychology*, *15*. https://doi.org/10.3389/fpsyg.2024.1408073
- **3.** Scalvini, F., **Bordeau, C**., Ambard, M., Migniot, C., & Dubois, J. (2024). Outdoor Navigation Assistive System Based on Robust and Real-Time Visual–Auditory Substitution Approach. *Sensors 24*(1), 166. https://doi.org/10.3390/s24010166
- 4. Scalvini, F., **Bordeau, C**., Ambard, M., Migniot, C., & Dubois, J. (2024). Outdoor Navigation Assistive System Based on Robust and Real-Time Visual–Auditory Substitution Approach. *Sensors 24*(1), 166. https://doi.org/10.3390/s24010166
- Scalvini, F., Bordeau, C., Ambard, M., Migniot, C., Vergnaud, M., &Dubois, J. (2024). uB-VisioGeoloc: An image sequences dataset of pedestrian navigation including geolocalised-inertial information and spatial sound rendering of the urban environment's obstacles. *Data In Brief*, 110088. https://doi.org/10.1016/j.dib.2024.110088
- 6. Bordeau, C., Scalvini, F., Migniot, C., Dubois, J., & Ambard, M. (2023). Cross-modal correspondence enhances elevation localization in visual-to-auditory sensory substitution. *Frontiers in Psychology, 14*. https://doi.org/10.3389/fpsyg.2023.1079998

Communications in international peer-reviewed conferences

- 1. Bordeau, C., Scalvini, F., Migniot, C., Dubois, J. & Ambard, M. (2023). Visual-to-auditory conversion methods for sensory substitution: soundspatialization only versus cross-modal correspondence, *International Multisensory Research Forum (IMRF 2023)*, Bruxelles, Belgium (poster)
- 2. Bordeau, C., Scalvini, F., Migniot, C., Dubois, J. & Ambard, M. (2023). Investigation of the effect of distractors on localization abilities with avisual-to-auditory substitution device, *International Multisensory Research Forum (IMRF 2023)*, Bruxelles, Belgium (poster)
- **3.** Bordeau, C., Scalvini, F., Migniot, C., Dubois, J. & Ambard, M. (2022). Distance perception of object using visual-to-auditory sensory substitution: comparison of conversion methods based on sound intensity and envelope modulation, *21st Auditory, Perception, Cognition and Action Meeting (APCAM 2022)*, Boston, United States. (poster)
- 4. Scalvini, F., **Bordeau, C**., Ambard, M., Migniot, C., Argon, S., & Dubois, J. (2022).Visualauditory substitution device for indoor navigation based on fast visual marker detection, *16th International Conference on Signal Image Technology and Internet Based Systems*, Dijon, France.
- Scalvini, F., Bordeau, C., Ambard, M., Migniot, C., & Dubois, J. (2022). Low-Latency Human-Computer Auditory Interface Based on Real-Time Vision Analysis. *ICASSP 2022 - 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. https://doi.org/10.1109/icassp43922.2022.9747094

Conferences without proceedings

- 1. Bordeau, C., Scalvini, F., Migniot, C., Dubois, J. & Ambard, M. (2022). Comparison of visual-toauditory conversion methods for sensory substitution in a localization task. *Journée des doctorants du Laboratoire d'Etude de l'Apprentissage et du Développement*, Dijon, France (oral communication)
- 2. Bordeau, C., Scalvini, F., Migniot, C., Dubois, J. & Ambard, M. (2022). Comparison of auditory encodings for visual-to-auditory sensory substitution in a localization task, *Forum des Jeunes Chercheurs de l'Ecole Doctorale Environnement-Santé*, Dijon, France (poster)

Scientific Vulgarisation

- **1. Scientific Meeting teachers-researchers**. Marseille, France, March 20th 2025. (Workshops with 3 groups of 5 highschool teachers to present my postdoc project and experimental setup)
- European Researchers Night 2023 « Our futures » Objects of the future. https://mariesklodowska-curie-actions.ec.europa.eu/event/2023-european-researchers-night. Dijon, France. September, 29th, 2023. (Workshop with adults and young people to discuss about my PhD research).
- Bordeau, C., Scalvini, F. « Open the ears to better see ». 5th day of scientific culture at the Institut Marey, Dijon, France. March, 28th & May, 2nd, 2023. (Workshops with discussions and demonstrations about my PhD research with 4 groups of 8 high school students)
- 4. Bordeau C. « Glasses to help blind people to localize obstacles with sounds ». https://www.experimentarium.fr/les-chercheurs/des-lunettes-pour-aider-les-personnesaveugles-localiser-des-obstacles-grace-des-sons. *Experimentarium*. Dijon, France. (Workshops to discuss my PhD research with 15 groups of 7 youngs between 10 and 20 years old)

AWARD

Best Poster Award of the session Cognition, Learning and Movement (10 posters in the session) - Congress of Young Researchers of the Doctoral School "Environments – Health"

Dijon, France June 16, 2022

TECHNICAL TOOLS AND PROGRAMMING SKILLS

<u>Guiding technique for blind and visually impaired individuals</u> with the Yeux en promenade and Voir & Percevoir associations (2-day course, September 2021).

Experimental plateform implementation

Unity: Virtual reality experiments

PTVR (Perception Toolbox for Virtual Reality): Virtual reality experiments

Psychopy: behavioural experiments

Open Sesame: behavioural experiments

Virtual Reality

Apparatus: HTC Vive Pro, Occulus Quest

Unity: Design and implementation of experiments with Unity and C# programming, Management of HTC Vive Trackers for motion capture

PTVR : Perception Toolbox for Virtual Reality : design and implementation of experiments in VR with Python programming

Data analysis & Statistics

R : Statistical analyses of behavioral data with ANOVA, Linear and Non-Linear Mixed Models (LMM, NLMM), correlations, linear regression, t-test, Statistical analyses of EEG data

Python: Additive sound synthesis to generate experimental material, EEG data processing with MNE Python, Auditory signal processing, KNN algorithm

Measurements

Behavioral measures, electroencephalography, retinal imaging and visual field (microperimetry, MP-3)

Programming Languages

LaTex, Python, R, C#, html, PHP, CSS

Course	Level	Institution
Cognitive Ergonomy	Third year degree in Psychology	University of Burgundy, France
Statistics for Experimental Psychology	Third year degree in Psychology	University of Burgundy, France

SUPERVISION

Master 2 student

2024-2025: Célia Passerel, Aix-Marseille University, "Investigation of the abilities of central visual field loss patients to point at target displayed among distractors in virtual reality"

EXTRACURRICULAR ACTIVITIES & VOLUNTEERING

Member of the organizational panel of ZEST (Zone for Early-Carrier Scientists' Talks)	Marseille, France 2025
Organization of workshops dedicated to PhD students and postdoctoral researchers at the Center for Research in Psychology and Neuroscience	
French federation of students and young workers in Cognitive Science (Fresco)	France 2019–2020
Vice-president in charge of students' associations	
Project leader for the Colloquium of young researchers in Cognitive Science	
Project leader for the guide for cognitive science students	
Lyon student association in Cognitive Science (Estigma)	Luca Francis
Event team leader	Lyon, France 2018 – 2019
Organized 3 conference for popularization of Cognitive Science	