

Marc-Aurèle RIVIÈRE

Research / Data Scientist

Cognitive Neuroscientist interested in Behavioral Research, Data Science, and Human-Machine Interfaces.

Work experience

Research Engineer

LITIS Rouen, France / 2021 - 2022

- ◆ Designed & developed a VR/AR platform in Unity to evaluate and train non-visual navigation for Visually Impaired People (VIP). Navigation-relevant information is provided through custom audio and tactile wearable interfaces, using motion tracking systems.
- ◆ Evaluated the impact of the information provided on navigational performance.

Graduate Teaching Fellow

University of Rouen Rouen, France / 2017 - 2020

Lectures & practicals on Web Development, Python programming, GUI design in Java (Swing), Image Processing in Python, and Intro to ML/DL models for Computer Vision

Research Internship (Indoc)

SKERI San Francisco / 11-2018 - 02-2019

Worked on an indoor localization solution using Visual Inertial Odometry, particle filtering, object detection, and real-time video streaming (Python/Flask, Swift)

Research Internship

LPNC & GIPSA-Lab Grenoble, France / 2016

- ◆ Development of an audio interface converting depth images into sound (C++/Qt)
- ◆ Evaluation of non-visual shape recognition with blindfolded participants

Education

PhD - Cognitive Neurosciences (unfinished - COVID)

Normandy University Rouen, France / 2017 - 2020

Design, implement, and evaluate a wearable haptic interface to help Visually Impaired People navigate autonomously, based on spatial cognition & perception models

Student Entrepreneurship program

PEPITE Rouen, France / 2018 - 2019

Project management, KPI, Business plan, Branding, IP, A/B testing

M. Sc. - Cognitive Neurosciences

PHELMA - Grenoble INP Grenoble, France / 2015 - 2016

Vision, Attention, Language, and Memory models ◆ Bayesian modeling ◆ Deep Learning

M. Sc. - Social & Organisational Psychology

University of Strasbourg Strasbourg, France / 2013 - 2015

Recruitment, Skill assessment, Occupational Health, Work Ergonomics

R&D projects

ACCESSPACE

- ◆ Design of a wearable vibrotactile belt for haptic-based navigation for VIP
- ◆ Develop wearable camera-based solutions for indoor localization and mapping

TETMOST & NAV-VIR

- ◆ Participated in the design of an interactive haptic tablet to display simplified images
- ◆ Developed an application to display images and maps on a haptic tablet (Java)

Data Science projects

Immunohistochemistry analysis

- ◆ Analysis of immunohistochemistry data with generalized multilevel models.
- ◆ Automatic generation of [documentation](#) & reports for the analyses (Quarto).

[Ongoing] Q-PCR Genomics

- ◆ Statistical analysis of Q-PCR data using Bayesian multilevel models.
- ◆ Created an [interactive web application](#) (Shiny) to facilitate data exploration.



✉ marc.aurele.riviere@gmail.com

🏠 France

📅 31 years old

🔗 <https://ma-riviere.me>

Languages

French - Native

English - Bilingual

Spanish - A2

Norwegian - A2

Assets

Inquisitive | Autonomous | Assertive | Creative | Adaptable

Training & Certificates

- ◆ Google Data Analyst (ongoing)
- ◆ Cognitive Modeling (CMAH'21)
- ◆ Data Science School (DS3'21)
- ◆ Neuromatch Academy (NMA'20)
- ◆ Probabilistic AI School (ProbAI'19)
- ◆ Computer Vision School (ICVSS'17)

Conference Talks

- ◆ RUNN 2019 (Caen, FR)
- ◆ CJCSC 2019 (Paris, FR)
- ◆ ICCHP 2018 (Linz, Austria)
- ◆ HANDICAP 2018 (Paris, FR)

Conference Posters

- ◆ NER 2019 (San Francisco, USA)
- ◆ RUNN 2019 (Caen, FR)
- ◆ CRD 2019 (Caen, FR)
- ◆ French-Polish Research & Innovation forum 2017 (Warsaw, PO)

Invited Talks

- ◆ Burgundy University (Dijon, FR)
- ◆ Politechnika Łódzka (Łódź, PL)
- ◆ SKERI (San Francisco, USA)
- ◆ French-Norwegian PhD Day (Trondheim, NO)

Transferable skills

Behavioral Research

- ◆ Behavioral experiments (Psychophysics, Eye-tracking, Motion-tracking, VR/AR)
- ◆ Statistical & Computational modeling

Scientific Communication

- ◆ Co-organized the IHAW'20 international conference (*canceled due to COVID*)
- ◆ Organized a University-funded 2-day conference for PhD Students (JED 2017)
- ◆ Developed & participated in several international collaborations (USA, Italy, Poland)
- ◆ Participated in several public outreach sessions (Exhibits, Schools, Press)

R&D Project Management

- ◆ Designed & wrote a 600k€ research grant (project SAM-Guide, ANR 2021)
- ◆ Participated in ethics applications & Data Management Plan (GDPR)
- ◆ Recruited & supervised multiple interns from various fields

Technical skills

Data Science

Data wrangling (Tidyverse, data.table, arrow) ◆ Database (DuckDB) ◆ Web Scraping ◆ Visualizations (ggplot) ◆ Dashboards (Shiny) ◆ Reporting (Quarto, R Markdown)

Statistics & Machine Learning

Bayesian Generalized Multilevel Models ◆ Location-Scale-Shape models ◆ Generalized Additive Models ◆ Survival Analysis ◆ IRT ◆ ARIMA ◆ HMM ◆ Mixtures ◆ Power Analysis

Computer Vision & Robotics

Image Processing ◆ Feature detection ◆ Segmentation ◆ Odometry

Web Development

JAM-Stack (Hugo, Quarto) ◆ NodeJS, Flask ◆ Dashboards (R Shiny) ◆ Flutter

Publications

Faugloire, E., Lejeune, L., **Rivière, M.-A.**, & Mantel, B. (2022). Spatiotemporal influences on the recognition of two-dimensional vibrotactile patterns on the abdomen. *Journal of Experimental Psychology: Applied*, 28(3), 606–628. <https://doi.org/10.1037/xap0000404>

Conference Proceedings

Coughlan, J. M., Biggs, B., **Rivière, M.-A.**, & Shen, H. (2020). An Audio-Based 3D Spatial Guidance AR System for Blind Users. In K. Miesenberger, R. Manduchi, M. Covarrubias Rodriguez, & P. Peñáz (Eds.), *Computers Helping People with Special Needs* (Vol. 12376, pp. 475–484). Springer International Publishing.

Souradi, A., Lecomte, C., Romeo, K., Gay, S., **Riviere, M.-A.**, El Moataz, A., & Pissaloux, E. (2020). Towards the Tactile Discovery of Cultural Heritage with Multi-approach Segmentation. In A. El Moataz, D. Mammass, A. Mansouri, & F. Nouboud (Eds.), *Image and Signal Processing* (Vol. 12119, pp. 14–23). Springer International Publishing.

Rivière, M.-A., Gay, S., Romeo, K., Pissaloux, E., Bujacz, M., Skulimowski, P., & Strumillo, P. (2019). NAV-VIR: An audio-tactile virtual environment to assist visually impaired people. *2019 9th International IEEE/EMBS Conference on Neural Engineering (NER)*, 1038–1041.

Rivière, M.-A., Gay, S., & Pissaloux, E. (2018). TactiBelt: Integrating Spatial Cognition and Mobility Theories into the Design of a Novel Orientation and Mobility Assistive Device for the Blind. In K. Miesenberger & G. Kouroupetroglou (Eds.), *Computers Helping People with Special Needs* (Vol.10897, pp. 110–113). Springer International Publishing.

Gay, S., **Rivière, M.-A.**, & Pissaloux, E. (2018). Towards Haptic Surface Devices with Force Feedback for Visually Impaired People. In K. Miesenberger & G. Kouroupetroglou (Eds.), *Computers Helping People with Special Needs* (Vol. 10897, pp. 258–266). Cham: Springer International Publishing.

Programming Skills

R

Tidyverse, Easystats, Tidymodels, brms, mgcv, glmmTMB, emmeans

Python

Tidypolars, skimimage, OpenCV, flask

Java

Swing, JAXB

C#

Unity, LINQ

JavaScript

NodeJS, Express, Socket.io

HTML & CSS

SQL

DuckDB

Stan

C / C++

Frameworks & Tools

Scientific Publishing

Quarto, R Markdown

Git / SVN

R Shiny

Unity

OpenMaze, Steam Audio

OpenCV

Flutter

Arduino

IDE

- ◆ RStudio, PyCharm, IntelliJ, VS Code
- ◆ Unity Editor, Android Studio
- ◆ G. Colab, Jupyter, RStudio Cloud