

# Marc-Aurèle RIVIÈRE

## Researcher & Data Scientist

Ex-academic turned Data Scientist ♦ Identify issues, synthesize theories, engineer solutions, design experiments, wrangle data, extract insights ♦ Proficient R coder.

### Work experience

#### Research Engineer

LITIS Rouen, France / 2021 - 2023

- ♦ Designed & lead the development of an Augmented Reality platform in Unity (C#) with motion tracking, to evaluate and train non-visual navigation for Visually Impaired People (VIP)
- ♦ Designed a wearable vibrotactile belt for haptic-based navigation for VIP, and participated in the design of an interactive haptic tablet to display images to VIP (Java/Arduino)
- ♦ Designed experiments to evaluate the impact of spatial cues on navigational performance
- ♦ Developed and tested camera-based solutions for indoor localization (Python/C++)

#### Graduate Teaching Fellow

University of Rouen Rouen, France / 2017 - 2020

Gave university lectures & practicals on Web Development, General programming in Python, GUI design with Java, Image Processing, and Machine/Deep Learning for Computer Vision

#### Engineering Intern

SKERI San Francisco, USA / 2018

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

#### Research & Engineering Intern

LPNC & GIPSA-Lab Grenoble, France / 2016

- ♦ Developed an image-to-sound conversion app for blind shape exploration on a tablet (C++)
- ♦ Iteratively improved the app based on statistical analysis of users' performance

#### HR Analyst Intern

AFPA Strasbourg, France / 2015

- ♦ Developed a tool (Excel/VBA) to help gather & index job offers for vocational training clients
- ♦ Offered training sessions on how to optimize their job search and tailor their applications

### Data Science consulting

#### Automated client prospection

- ♦ Creating an R program to automate lead acquisition and management for a leasing company (web & LinkedIn scraping, LLM, Nutshell DB, and statistical modeling)

#### Bioinformatics & Biostatistics

- ♦ Processed & analyzed immunohistochemistry & qPCR data with generalized multilevel models
- ♦ Created an [interactive web application](#) (Shiny) to facilitate data exploration for team members
- ♦ Automated reporting & [documentation](#) generation for those analyses (R & Quarto)

### 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, Intellectual Property, A/B testing

#### MSc. - Cognitive Neurosciences

PHELMA - INPG Grenoble, France / 2015 - 2016

Experimental design, Statistical & Bayesian modeling, Deep Learning ♦ Memory & Perception

#### MSc. - Social & Organisational Psychology

University of Strasbourg Strasbourg, France / 2013 - 2015

Recruitment, Skill assessment, Occupational Health, Work Ergonomics, Survey design



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🏠 France

📅 32 years old

🌐 <https://ma-riviere.com>

### Languages

French - Native

English - Bilingual

Spanish - A2

Norwegian - A2

### Assets

Inquisitive | Autonomous | Assertive | Creative | Adaptable

### Training & Courses

- ♦ 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)

## Technical skills

### Data Science

Data wrangling (Tidyverse, data.table) ♦ Database (DuckDB, PostgreSQL) ♦ Web Scraping (rvest, httr2) ♦ Visualizations (ggplot) ♦ Dashboards (Shiny) ♦ Publishing (Quarto, R Markdown)

### Statistics & Machine Learning

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

### Web Development

JAM-Stack (Quarto, Hugo) ♦ Back-End (NodeJS, Flask, plumber) ♦ Shiny ♦ Android/Flutter

### Computer Vision & Robotics

Image Processing ♦ Feature detection ♦ Segmentation ♦ Odometry ♦ SLAM

## Transferable skills

### Experimental Research

- ♦ Design of experiments (Psychophysics, Eye-tracking, Motion-tracking VR/AR)
- ♦ Multidisciplinary literature reviews & technological watch
- ♦ Writing & publishing scientific reports and papers

### Scientific Communication

- ♦ Co-organized international (IHAW'20) and regional (JED'17) scientific conferences
- ♦ Initiated & participated in several international collaborations
- ♦ Engaged in several public dissemination events (during exhibits, or in the press)

### R&D Project Management

- ♦ Created & wrote a 600k€ research grant proposal (ANR project "SAM-Guide", 2021)
- ♦ Participated in the management of multiple national and international research projects
- ♦ Recruited & supervised multiple interns from various fields

## Publications (journal)

Rodriguez-Duboc, A., Basille-Duguay, M., Debonne, A., **Rivière, M.-A.**, Vaudry, D., & Burel, D. (In Press). Apnea of Prematurity induces short and long-term development-related transcriptional changes in the murine cerebellum. *Current Research in Neurobiology*.

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>

## Publications (proceedings)

Coughlan, J.M., Biggs, B., **Rivière, M.-A.**, Shen, H. (2020). An Audio-Based 3D Spatial Guidance AR System for Blind Users. In Miesenberger, K., Manduchi, R., Covarrubias Rodriguez, M., Peñáz, P. (Eds.), *Lecture Notes in Computer Science* (Vol. 12376, pp. 475–484). Springer Int. Publishing. [https://doi.org/10.1007/978-3-030-58796-3\\_55](https://doi.org/10.1007/978-3-030-58796-3_55)

**Riviere, 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. *Proceedings of the 9th International IEEE/EMBS Conference on Neural Engineering*, 1038–1041. <https://doi.org/10.1109/NER.2019.8717086>

**Riviere, 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 Miesenberger, K., Kouroupetroglou, G. (Eds.), *Lecture Notes in Computer Science* (Vol. 10897, pp. 110–113). Springer Int. Publishing. [https://doi.org/10.1007/978-3-319-94274-2\\_16](https://doi.org/10.1007/978-3-319-94274-2_16)

Gay, S., **Rivière, M.-A.**, Pissaloux, E. (2018). Towards Haptic Surface Devices with Force Feedback for Visually Impaired People. In Miesenberger, K., Kouroupetroglou, G. (Eds.), *Lecture Notes in Computer Science* (Vol. 10897, pp. 258–266). Springer Int. Publishing. [https://doi.org/10.1007/978-3-319-94274-2\\_36](https://doi.org/10.1007/978-3-319-94274-2_36)

## Programming Skills

### R

*Tidyverse*, data.table, Shiny, gt, glmmTMB, lme4, afex, mgcv, brms, *Stanverse*, *Easystats*, emmeans

### Python

skimage, numpy, (Tidy)polars, OpenCV, flask, plotnine

### Java

Swing, JAXB

### C#

Unity, LINQ

### JavaScript

NodeJS, Socket.io, Arquero; OJS

### HTML & CSS

### SQL

DuckDB, PostgreSQL

### Stan

### C / C++

## Frameworks & Tools

### Scientific Publishing

Quarto, R Markdown, LaTeX

### Git / SVN

### Shiny

### CI/CD

GitHub Actions

### Unity

OpenMaze, Steam Audio

### OpenCV

### Arduino

### Docker

### IDE

- ♦ RStudio, VS Code, PyCharm, IntelliJ
- ♦ Unity Editor, Android Studio
- ♦ Google Colab, Jupyter, Posit Cloud, Codespaces