

Marc-Aurèle RIVIÈRE

Researcher & Data Scientist

Cognitive Neuroscientist turned Data Scientist ♦ Identify issues, conceptualize theories, engineer solutions, design experiments, wrangle data, extract insights ♦ Perception, Navigation, AR, HMI ♦ Proficient R coder & decent software engineer.

Work experience

Research Engineer

LITIS Rouen, France / 2021 - 2023

- ♦ Designed & led 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

Research Engineer 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 Engineer 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 - Biomedical Engineering & Cognitive Sciences (unfinished - COVID)

Normandy University Rouen, France / 2017 - 2020

- ♦ Spatial Cognition, Perception, Human-Machine Interfaces, Accessibility
- ♦ Design of Experiments, Statistical Modeling, Computer Vision, Augmented Reality

Student Entrepreneurship program

PEPITE Rouen, France / 2018 - 2019

Project management, KPI, Business plan, Branding, Intellectual Property, A/B testing

MSc. - Computational & Cognitive Neurosciences

PHELMA - INPG Grenoble, France / 2015 - 2016

- ♦ Memory, Perception, Linguistics, Robotics, Imaging (fMRI, EEG, MEG)
- ♦ Experimental design, Statistics, Bayesian modeling, Deep Learning, Signal processing

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

📅 33 years old

🌐 <https://ma-riviere.com>

Languages

French - Native

English - Bilingual

Norwegian (Bokmål) - A2

Spanish - 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, Selenium, httr2) ♦ Visualizations (ggplot) ♦ Dashboards (Shiny) ♦ Publishing (Quarto)

Statistics & Machine Learning

Bayesian Generalized Multilevel Location-Scale-Shape Models ♦ Generalized Additive Models ♦ Survival Analysis ♦ IRT ♦ ARIMA ♦ HMM ♦ Mixture Models ♦ Clustering ♦ 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
- ♦ Data analysis & complex quantitative methods

Scientific Communication

- ♦ Wrote & published multiple scientific papers and technical reports
- ♦ Co-organized an international (IHAW'20) and a regional (JED'17) scientific conference
- ♦ Engaged in science dissemination events for both technical and non-technical audiences

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 disciplines

Scientific Publications

Rodriguez-Duboc, A., Basille-Dugay, M., Debonne, A., **Rivière, M.-A.**, Vaudry, D., & Burel, D. (2023). Apnea of prematurity induces short and long-term development-related transcriptional changes in the murine cerebellum. *Current Research in Neurobiology*, 5, 100113. <https://doi.org/10.1016/j.crneur.2023.100113>

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>

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

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

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

Programming Skills

R

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

Python

skimage, numpy, (Tidy)polars, OpenCV, flask, lets-plot

Java

Swing, JAXB

C#

Unity, LINQ

JavaScript

NodeJS, Socket.io, Arquero; OJS

SQL

DuckDB, PostgreSQL

HTML & CSS

Stan

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