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
♦ 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 / 2018 - 2019
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 interface converting depth images into sound (C++/Qt) for vision-less shape recognition on a tactile tablet, iteratively improved based on users' performance

Data Science consulting

Automated client prospection
♦ Automating lead acquisition for a leasing company, using a combination of D&B, web scraping, ChatGPT API, and statistical modeling (R)
♦ Improving management and storage of leads & prospects

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, IP, A/B testing

MSc. - Cognitive Neurosciences
PHELMA - Grenoble INP Grenoble, France / 2015 - 2016
Bayesian modeling ◈ Vision, Attention, Language, and Memory models ◈ Deep Learning

MSc. - Social & Organisational Psychology
University of Strasbourg Strasbourg, France / 2013 - 2015
Recruitment, Skill assessment, Occupational Health, Work Ergonomics, Survey design

✉ marc.aurele.riviere@gmail.com
⌂ France
🗓 32 years old
% https://ma-riviere.me

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) ◈ Dashbords (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. *Molecular and Cellular Neuroscience*.

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., Peňáz, 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, 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