

Maëliss Jallais

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📄 [Maëliss Jallais](#)  [mjallais](#)  [in mjallais](#)

Main research fields

Diffusion Magnetic Resonance Imaging (dMRI); Inverse problems; Machine Learning; Medical Imaging; Simulation-Based Inference; Neuroscience

Research experience

Jun 2022

–**now**
Research Associate

Postdoctoral position at the Cardiff University Brain Research Imaging Center (CUBRIC), Cardiff, UK

- *Research subject:* Microstructure imaging through diffusion MRI, computational modelling and machine learning,
- *Supervisor:* Marco Palombo,
- *In collaboration* with the Molecular Research Imaging Center (MIRCE) at the CEA Fontenay-aux-Roses, France, and the UCL Center for Medical Imaging Computing at the Department of Computer Science, London, UK.

Feb 2019
–**Feb 2022**

PhD Student

PhD program at Inria and CEA Neurospin, Parietal Team, Paris, France

- *Research subject:* Enabling cortical cell-specific sensitivity on diffusion MRI microstructure measurements using likelihood-free inference,
- *Supervisor:* Demian Wassermann,
- *University:* Université Paris-Saclay,
- *Date of defense:* 16/02/2022.

 [PhD thesis](#).

Feb–July
2018

6 months


End-of-study internship, GE Healthcare, Buc, France

- Image flow analysis and segmentation in an interventional procedure,
- *Supervisor:* Régis Vaillant.

2016–2017

1 year

One-year internship, Medical image analysis and visualization team, Kitware, Carrboro, North Carolina, USA

- Main developer of 3D scene reconstruction and object tracking system in C++,
- *Supervisor:* Stephen Aylward,
-  [AnatomicAugmentedRealityProjector](#): Ultrasound Augmentation: Rapid 3D scanning for tracking and on-body display in C++ using CMake.

Education

2015–2018

CPE Lyon, Department of Electronics, Lyon, France

- *Engineer Diploma*,
- *Major:* Image Analysis, Modeling and Computer Science,
- Cross disciplinary courses, centered around mathematics and computer science.

2017–2018

Research Master program, University Lyon 1, Lyon, France

- *Research Master:* Image, Development and 3D Technologies,
- Double degree with CPE Lyon.

2013–2015

Classes préparatoires aux Grandes Écoles, Lyon, France

- Intensive undergraduate program. Mathematics and Physics program.

Languages and Computer Science Skills

- **Languages**
 - *French*: Native speaker,
 - *English*: Fluent.
- **CS Languages:** Python, C++, C, Matlab
- **Collaborative tools:** git
- **Libraries:** Scikit-Learn, PyTorch, Dipy, ITK, VTK
- **Other:** Clusters (SLURM)

Publications

Journal Articles.

- M. **Jallais** and M. Palombo. μ GUIDE: a framework for quantitative imaging via generalized uncertainty-driven inference using deep learning. *eLife*, October 2024. [📄](#)
- M. **Jallais**, P. L. C. Rodrigues, A. Gramfort, and D. Wassermann. Inverting brain grey matter models with likelihood-free inference: a tool for trustable cytoarchitecture measurements. *The Journal of Machine Learning for Biomedical Imaging*, 2021. [📄](#)


International Conferences.

- L. Kitchingman, M. **Jallais**, K. Şimşek, E. Kopanoglu, R. Turner, and M. Palombo. Investigating magnetic field correlation sensitivity to demyelination and axonal loss using numerical simulations. In proceedings of *ESMRMB 2024 - 40th Annual Scientific Meeting*, Barcelona, October 2024. [📄](#)
- L. Rouillard, D. Wassermann, M. Palombo, and M. **Jallais**. Hierarchical- μ GUIDE: fast and robust bayesian hierarchical modelling using deep learning simulation-based inference. In proceedings of *ISMRM 2024 - 32nd Annual Meeting*, Singapore, May 2024. [📄](#)
- M. **Jallais**, M. Palombo, I. Jelescu, and Q. Uhl. Shining light on degeneracies and uncertainties in the NEXI and SANDIX models with μ guide. In proceedings of *ISMRM 2024 - 32nd Annual Meeting*, Singapore, May 2024. [📄](#)
- M. **Jallais** and M. Palombo. μ GUIDE: a framework for microstructure imaging via generalized uncertainty-driven inference using deep learning. In proceedings of *ISMRM 2023 - 31th Annual Meeting*, Toronto, Canada, June 2023. [📄](#)
- T. Meunier, C. Fang, M. **Jallais**, and D. Wassermann. Full posterior estimation of gray matter cytoarchitecture using a three-compartment model with exchange: a simulation-based study. In proceedings of *ISMRM 2022 - 30th Annual Meeting*, London, United Kingdom, May 2022. [📄](#)
- M. **Jallais**, P. L. C. Rodrigues, A. Gramfort, and D. Wassermann. Cytoarchitecture Measurements in Brain Gray Matter using Likelihood-Free Inference. In proceedings of *IPMI 2021*, Rønne, Denmark, June 2021. [📄](#)
- M. **Jallais**, P. L. C. Rodrigues, A. Gramfort, and D. Wassermann. Diffusion MRI-Based Cytoarchitecture Measurements in Brain Gray Matter using Likelihood-Free Inference. In proceedings of *ISMRM 2021 - 29th Annual Meeting*, Vancouver, Canada, May 2021. [📄](#)
- M. **Jallais** and D. Wassermann. Indetermination-free cytoarchitecture measurements in brain gray matter via a forward diffusion MRI signal separation method. In proceedings of *ISMRM 2020 - 28th Annual Meeting*, Sydney, Australia, April 2020. [📄](#)
- M. **Jallais**, H. Greer, S. Gerber, M. McCormick, D. Chittajallu, N. Siekierski, and S. Aylward. Ultrasound augmentation: Rapid 3-d scanning for tracking and on-body display. In proceedings of *Imaging for Patient-Customized Simulations and Systems for Point-of-Care Ultrasound: International Workshops, BIVPCS 2017 and POCUS 2017, Held in Conjunction with MICCAI 2017*, pages 138–145, Québec City, QC, Canada, Sept 2017. Springer. [📄](#)
- S. Gerber, M. **Jallais**, H. Greer, M. McCormick, S. Montgomery, B. Freeman, D. Kane, D. Chittajallu, N. Siekierski, and S. Aylward. Automatic estimation of the optic nerve sheath diameter from ultrasound images. In proceedings of *Imaging for Patient-Customized Simulations and Systems for Point-of-Care Ultrasound: International Workshops, BIVPCS 2017 and POCUS 2017, Held in Conjunction with MICCAI 2017*, pages 113–120, Québec City, QC, Canada, Sept 2017. Springer. [📄](#)

National Conferences.

M. Jallais and M. Palombo. μ GUIDE: une architecture pour l'imagerie de la microstructure par inférence guidée par l'incertitude par apprentissage profond. In proceedings of *SFRMBM*, Paris, France, March 2023.

Book chapters

M. Jallais and D. Wassermann. Single Encoding Diffusion MRI: a Probe to Brain Anisotropy. In *Anisotropy Across Fields and Scales*, published in Springer International Publishing, January 2021. .


Invited Talks

MIML 2023 Microstructure Imaging meets Machine Learning, Cardiff (UK).

Awards

Taith fund grand. Awarded £2000 for a research visit of a PhD student from the Technical University of Denmark (Thina Lundsgaard Thogersen, co-supervised by Marco Pizzolato and Tim Dyrby) for 3 weeks in CUBRIC.

Travel Grant from SFRMBM and FLI, 2024. Awarded 500€ for attending the annual scientific ESMRMB conference in Barcelona (Spain).

Winner of the Shark Tank competition, 2024. International entrepreneurial competition including mock interviews for convincing investors to invest in a hypothetical new company based on innovative ideas, with an expert judge panel. .

ISMRM 2024, Magna Cum Laude Merit Award. Trainee member award for an abstract ranked in the top 15% within the Diffusion MRI category.

Mansfield Research Innovation Award, 2024. Awarded £1500 from the British & Irish Chapter of ISMRM and Siemens to attend the annual ISMRM conference in Singapore.

Travel Grant from SFRMBM and FLI, 2024. Awarded 500€ for attending the annual ISMRM conference in Singapore.

ISMRM 2023, Summa Cum Laude Merit Award. Trainee member award for an abstract ranked in the top 5% within the Diffusion MRI category.

Travel Award from the Guarantors of Brain, 2023. Awarded £1000 for attending the annual ISMRM conference in Toronto (Canada).

Travel Grant from SFRMBM and FLI, 2023. Awarded 500€ for attending the annual ISMRM conference in Toronto (Canada).

ISMRM 2021, Magna Cum Laude Merit Award. Trainee member award for an abstract ranked in the top 15% within the Diffusion MRI category.

Supervision of students

2023-2024	Co-supervision of a PhD student (L. Rouillard) on "Hierarchical- μ GUIDE: fast and robust Bayesian hierarchical modelling using deep learning simulation-based inference".
Oct-Dec 2021 3 months	Co-supervision of a PhD student candidate (T. Meunier) on "Full posterior estimation of brain gray matter cytoarchitecture using a three-compartment model with exchange".
Mar-Aug 2021 6 months	Co-supervision of a master student from Paris-Sud University (N. Feng) on "Assessment of cytoarchitecture-connectivity relationship in the human cortex through diffusion MRI".

Teaching

Practical session assistant for the Machine Learning class. (9h, 2021) Formation continue ENSAE, Master level.

Practical session assistant for a software engineering project. (40h, 2021) Paris-Sud University, 3rd year Licence students.

Reviewer

Reviewer for a final year master student in 2024 at Rennes University (France) on "Anatomy- and microstructure-informed tractography for connectivity evaluation".

Reviewer for the ISMRM annual conference in 2023, 2024 and 2025.

Reviewer for *Magnetic Resonance in Medicine*.

Other Experiences

June 2024 **Organizing the Visual Computing Hackathon at Cardiff University.** International three-day event bringing researchers together to collaborate on open science projects in neuroimaging and computer science. 🌐 🌐

2022-2023
1 year **Chairing and organizing *Skill Session Meetings* at CUBRIC.** Aims to give tutorial presentations once a week by invited speakers.

May 2023
3 days **Planning and organizing CUBRIC MicroTeam Retreat.**

Jan 2023
1 day **Chairing and organizing CUBRIC Centre Conference.** One day conference involving 100 researchers.

2020 & 2021
2 days each **Rendez-vous des Jeunes Mathématiciennes et Informatiennes,** organised by Inria Saclay and Animaths. Aims to encourage female high school students to pursue scientific studies.

Jun-Jul 2014
5 weeks **Relief worker, teaching English to schoolchildren, Bali**

2013 & 2014
2 weeks each **Organizer at a summer camps, Telligo, France**

2012-2016
4 years **President of a dance club, CPE Lyon, Lyon, France**

2009-2012
3 years **Trainer and judge in Rhythmic Gymnastic, RSGR, Rambouillet, France**

References

- **Marco Palombo**, CUBRIC, Cardiff University, UK, palombom@cardiff.ac.uk
- **Demian Wassermann**, Inria Saclay, France, demian.wassermann@inria.fr
- **Alexandre Gramfort**, Meta, France, agramfort@meta.com
- **Stephen Aylward**, Kitware, North Carolina, USA, stephen.aylward@kitware.com