Curriculum Vitae

Elodie Germani

1 About me

Name, surname : Germani Elodie
Current situation : Postdoctoral researcher at University Hospital Bonn (Germany)

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Google Scholar : https://scholar.google.com/citations?user=BTAAgQEAAAAJ
GitHub : https://github.com/elodiegermani

2 Education

2021 - 2024 *Université de Rennes*	**Doctoral degree in Computer Sciences** "*Exploring and mitigating analytical variability in functional MRI with representation learning*", defense on 16/09/2024. Research lab : IRISA - UMR 6074 (Empenn and LACODAM) Supervision : Dr. Camille Maumet, Pr. Elisa Fromont
2019 - 2021 *Université de Rennes 1*	**Master's degree in Bioinformatics** Sp. Integrative Biology and Computer Sciences Mention "Très Bien". Ranked : 1/17.
2015 - 2018 *Université de Versailles St-Quentin*	**Licence in Medical Sciences** Diploma of General Training in Medical Sciences (DFGSM) First year common to Health Studies (PACES) - *Succeeded in one year, ranked : 70/699.*
2015 *Lycée St François d'Assise, Montigny-le-Btx*	**Baccalauréat Scientifique** Mention "Très Bien"

3 Research experience

10/2024 - Ongoing
Universitätsklinikum Bonn, Allemagne

Postdoctoral Fellow
Albarqouni Lab, Klinik für Diagnostische und Interventionelle Radiologie

Variability and biases in AI for medical imaging and their impact on representations learned by deep learning models.

- Analysis and mitigation of biases in representations learned by Foundation Models : Multi-site study on mammography classification (Publication **[5]**) ;
- Representation transfer to enhance the quality of low-resolution MRI data and detect anomalies (supervision of a Master's intern) ;
- Cost-effective federated learning to reduce representation biases (manuscript in preparation).

Supervised by : Pr. Shadi Albarqouni, Professor, Universitätsklinikum Bonn

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09/2021 - 09/2024
Université de Rennes, France

Ph.D. student
IRISA - UMR 6074 (Empenn and LACODAM)

Developing representation learning methods to explore and mitigate the effect of analytical variability in functional MRI studies (Publications **[2]**,**[4]**,**[6]**,**[7]**).

- Representation transfer for data reuse to improve the generalizability and robustness of neuroimaging studies ;
- Learning a low-dimensional representation of fMRI statistical maps, agnostic and reusable for decoding studies.

Supervised by : Dr. Camille Maumet, Research Scientist at Inria, Rennes and Pr. Elisa Fromont, Professor, Université de Rennes

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08/2023 - 11/2023
Concordia et McGill University, Montreal, Canada

Academic visitor (MITACS Fellowship)
Big Data for Neuroinformatics lab (Concordia), ORIGAMI Lab (McGill)

Project LivingPark : reproduction of publications on MRI biomarkers for Parkinson's disease and assessment of their robustness.

Impact of methodological variations on the performance of prediction models based on functional MRI markers. **(Publication [3],[9])**.

Supervised by : Pr. Tristan Glatard, Professor, Concordia University and Pr. Jean-Baptiste Poline, Professor, McGill University.

01/2021 - 07/2021
Université de Rennes 1, France

Master's level internship
IRISA - UMR 6074 (Équipe Empenn)

Developing a codebase reproducing fMRI pipelines used in a many analyst study (Narps Open Pipelines project).

Quantification of variability across pipelines results and evolution with sample size in group-level statistics **(Publication [8])**.

Supervised by : Dr. Camille Maumet, Research Scientist at Inria, Rennes.

04/2020 - 07/2020
Centre d'Immunologie de Marseille-Luminy, France

Master's level internship
IMAGIMM Laboratory

Development of an R/Shiny application to facilitate histopathology data analysis. The application features an interactive interface linking images to quantitative measurements (graphs) **(Publication [5])**.

Supervised by : Mathieu Fallet, Research Engineer, and Dr. Hugues Lelouard, Director of Research, CNRS, Marseille.

4 Teaching Experience

During my PhD and postdoctoral work, I taught various courses in **computer science, mathematics, and interdisciplinary subjects**. In total, I have taught **166 hours-equivalent TD (HETD)**. The audiences were diverse and interdisciplinary, reflecting both my academic background and my research.

In the first year of my PhD, I taught a course with a computer science component to undergraduate students in a biology program (1st year) ***(45 HETD)***. In the following two years, I mainly taught computer science students (1st year, 2nd year, or Master's level) ***(76 HETD)***. Later on, I taught medical students (Seminar on Artificial Intelligence in Radiology, UE Big and Complex Data Analysis) on topics related to the **use of artificial intelligence**, specifically promoting **best practices and critical thinking** when interpreting AI tool performance and results.

The table below summarizes the courses I taught :

Year	Institution	Audience	Course	Teaching Load (HETD)	Type	Tasks / Materials
2021 2022	Faculty of Mathematics University of Rennes 1	L1 Biology	Mathematics for Biology	45h	Lab (18h) Tutorial (27h)	Intro to programming and data analysis in Python. Statistics and probability tutorials (conditional probability, discrete and continuous distributions). *Session preparation (exercises, slides). Grading assignments.*
2021 2023	Fondation Rennes 1		L Codent, L Créent	20h	Lab (2×10h)	Creative programming in Python with middle school girls to promote computer science.
2022 2023	Faculty of Computer Science University of Rennes 1	L1 Computer Science	Computer Systems Principles	24h	Lab (20h) Tutorial (4h)	Introductory Python programming labs. Critical understanding and analysis : components and architectures of computer systems. *Project supervision : literature review on natural language processing.*
2022 2023	Faculty of Computer Science University of Rennes 1	L1 Computer Science	Professional Project & Communication	8h	Lab (8h)	Introduction to word processing with OpenOffice.
2022 2024	Faculty of Computer Science University of Rennes	M2 Computer Science, Software Engineering track	Machine Learning	20h	Lab (2×10h)	Introduction to machine learning in Python (scikit-learn, Keras). Critical understanding : hyperparameter selection, validation, performance metrics. *Design of teaching materials (exercises, datasets). Project supervision : software for handwritten letter and digit recognition.*
2023 2024	Faculty of Computer Science University of Rennes	L2 Computer Science	Data Science	24h	Lab (24h)	Introduction to programming in R for data analysis. Critical understanding : modeling and statistical testing, data visualization, time series analysis. *Session preparation. Grading assignments.*
2023 2024	Faculty of Medicine University of Rennes	M2 Signals and Imaging in Biology and Medicine	Big and Complex Data Analysis	3h	Lecture (3h)	Teaching of processing pipeline concepts, analytical variability, and publication practices. *Adaptation of lecture materials and exam. Grading assignments.*
2024	Arab-German Young Academy of Sciences and Humanities	Master's and PhD students (interdisciplinary)	Summer School AGYA Summer School on Affordable AI	10h	Lab (10h)	Introduction to machine learning in Python. Critical understanding : hyperparameter selection, evaluation, resource-constrained scenarios. *Preparation and delivery of sessions.*

2024 2025	University Hospital Bonn	Medical students	AiR Seminars "Artificial Intelligence in Radiology: Applications and Research"	12h	Lecture (12h)	Teaching the role of AI tools in medical imaging : classification, detection, prediction, segmentation. Critical understanding : evaluation of ethical and regulatory considerations in deploying AI in healthcare – bias, uncertainty. *Assistant coordinator : preparation of course materials, logistics, support to instructors. Organization of assessments : presentation and critical analysis of a research paper.*

Total : 166h

5 Scientific community

5.1 Awards and Distinctions

— **2024 For Women In Science Young Talents Award – L'Oréal Foundation and UNESCO**
Selected for my doctoral research along with 34 other PhD and postdoctoral researchers from over 800 applications. This award aims to promote the careers and contributions of young women in science. Includes a €15,000 grant and training in Leadership, Management, and Media. [Press Book]

— **Mobility Grants**
MITACS Global Research Award (6,000 CAD) and Matisse Doctoral School Grant (€2,400) to support a 4-month research stay in the lab of Prof. Tristan Glatard at Concordia University, Montreal.

— **Best Poster Award** in medical imaging (€500) and Travel Award (€400) at the IABM 2024 conference.

5.2 Invited Talks

— **Invited Seminars**
  — ORIGAMI Lab, McGill University (Montreal), July 2023
  — IPI Team, LS2N (Nantes), March 2025
  — MEDICIS Team, LTSI (Rennes), April 2025

— **"Women in Science: Breaking Frontiers – A Data Perspective"**
Panel discussion on the importance of data diversity in health-related artificial intelligence.
Institut Français, Vienna (Austria) – 11/02/2025.

— **"L Codent, L Créent : an opportunity to introduce girls to computer science"**
Presentation of the initiative at the Femmes et Sciences 2022 Conference. Rennes (France) – 18/11/2024.

5.3 Supervision

— **Ilayda Selin Türk – TU Munich (November 2024 – March 2025)**
Master's Thesis – "Investigating Bias in AI Algorithms for Breast Cancer Detection from Mammography Imaging: A Focus on Generalization to Unseen Populations"
Co-supervised with Prof. Shadi Albarqouni.

— **Malek Al Abed – TU Munich (October 2024 – Present)**
Master's Thesis – "Deep Learning for Low-field Brain Image Quality Transfer"
Co-supervised with Prof. Shadi Albarqouni.
Additional supervision : Prof. Hemmen Sabir, Dr. Anne Groteklaes, and Dr. Sebiha Demir.

— **Thibault Chanus – ENS Rennes (October 2023 – January 2024)**
Master 1 Project – Diffusion models for style transfer tasks.
Co-supervised with Prof. Elisa Fromont.

— **Maiwenn Fleig – Düsseldorf University (April 2023 – July 2023)**
Engineering Project – Use of diffusion models for functional MRI data.
Co-supervised with Prof. Elisa Fromont.

5.4 Scientific community

Scientific events

— **German Postdoc Network** : Member of the working group for the annual conference.

— **FLUID Workshop (AAAI 2025)** : Member of the outreach committee.

— **Summer School on Affordable AI 2024 (AGYA)** : Involved in organization, logistics, mentoring, and tutoring.

— **Narps Open Pipelines Hackathons** : Internal organizer (within IRISA and the ORIGAMI lab), external project manager at OHBM Brainhack 2022 and 2023.

— **IDA 2022 Conference** : Organization and logistics (student committee).

Reviewing

— **Conferences** : MIDL 2025 (Salt Lake City, USA), MICCAI 2024 (Marrakech, Morocco).
Area Chair for MICCAI 2025 (Daejeon, South Korea).

— **Journals** : Scientific Report, Imaging Neurosciences, npj Digital Medicine.

Representation

I was elected as a **PhD Student Representative** on the Doctoral Council of the Matisse Doctoral School of the Bretagne-Loire Doctoral College from September 2022 to September 2024.

5.5 Scientific outreach

— **Pint of Science** : Event manager for the 2024 edition, under the theme "*Our Body*".

— **TISSAGE** : Training in science communication offered by the Doctoral School as part of the TISSAGE project. Led a quiz on the topic "*Artificial Intelligence vs. Human Intelligence*". [Materials]

— **L Codent, L Créent** : Facilitated creative Python programming workshops for middle school girls to promote and demystify computer science. Participated from 2021 to 2023. [Materials]

— **Computing without computer** : Workshops about computer sciences in schools. [Website]

— **Brain Awareness Week** : Designed and hosted a quiz : "*Research Careers in Neuroimaging*". Participated in the 2022 and 2024 editions (project lead in 2024). [Materials]

6 Other experiences

2025 *Soluvitrage*	**Web Development** Development of a web tool for managing appointments, inventory, and revenue. Python programming with Flask, connected to an SQL database.
2019 *SCC France*	**IT Support Technician (Level 1)** Assignment at the Ministry of Armed Forces (Paris, France). Scheduling and appointment management, computer replacement, technical support, and inventory management.
2017–2018 *i-Share*	**Communications Assistant** i-Share is a cohort study on student health (`https://www.i-share.fr/`). Tasks included promoting the study to students : setting up booths, giving presentations at forums, open days.

7 Technical skills

Programming	Python : Expert. *Deep learning (PyTorch, scikit-learn), Data (NumPy, pandas), Visualization (matplotlib, seaborn).* R : Intermediate HTML/CSS : Intermediate Java : Beginner Matlab : Beginner
Software	Neuroimaging (FSL, SPM) : Advanced
Other	LaTeX : Advanced Git : Advanced Docker/Apptainer : Intermediate

8 Publications

Here are my publications published or accepted in peer-reviewed international journals and conferences. In artificial intelligence and medical imaging, the first authors are those who led the work, and the last authors are the supervisors. Journal rankings are based on Scimago, and conference rankings come from ICORE.
* indicates equal contribution among co-authors.

Journal Papers

[1] The HCP multi-pipeline dataset : an opportunity to investigate analytical variability in fMRI data analysis
Germani, E., Fromont, E., Maurel, P., Maumet, C. DOI : arXiv :2312.14493.
Accepted for publication in Scientific Data. Dataset available in Public nEUro.
Scientific Data was Q1 in Computer Science Applications in 2022.
[Preprint] [Code]

[2] On the validity of fMRI studies with subject-level data processed through different pipelines
Germani, E.*, Rolland, X.*, Maurel, P., Maumet, C.
Imaging Neuroscience ; 3. DOI : 10.1162/imag_a_00522.
Imaging Neuroscience is a young journal created after resignation of NeuroImage Editorial Board (Q1 in Neuroscience in 2023) following an increase of APC.

[Article] [HAL] [Code]

[3] Predicting Parkinson's disease trajectory using clinical and functional MRI features : a reproduction and replication study
Germani, E., Baghwat, N., Dugré, M., Gau, R., Montillo, A. A., Nguyen K. P., Sokolowski A., Sharp, M., Poline JB., Glatard, T.
PLOS ONE 20(2) : e0317566. DOI : 10.1371/journal.pone.0317566.
In 2023, PLOS ONE was Q1 in "Multidisciplinary".

[Article] [HAL] [Code]

[4] On the benefits of self-taught learning for brain decoding
Germani, E., Fromont, E.*, Maumet, C.*
GigaScience, 2023, Vol. 12, pp.1-17. DOI : 10.1093/gigascience/giad029.
In 2023, *GigaScience* was Q1 in "Computer Science Applications and Health Informatics".

[Article] [HAL] [Code] [Supplementary]

[5] SAPHIR : a Shiny application to analyze tissue section images
Germani, E., Lelouard, H., Fallet, M.
F1000Research, 2020, 9, pp.1276. DOI : 10.12688/f1000research.27062.2.
In 2020, F1000Research was Q1 in "Medicine (miscellaneous)". F1000Research is a journal with post-review, the manuscript has been approved after revision by 2 reviewers. The paper is in the category "Software Tool Article".

[Article] [HAL] [Code]

International Conference Papers

[5] Bias and Generalizability of Foundation Models across datasets for breast Mammography Classification
Germani, E., Selin-Türk, I., Zeineddine, F., Mourad, C., Albarqouni, S.
Accepted at MICCAI 2025 (**early-acceptance, 9% of submission**).
Extended version in process, target journal : *Nature Machine Intelligence*.

[6] Mitigating analytical variability in fMRI results with style transfer
Germani, E., Fromont, E.*, Maumet, C.*
Accepted at MIDL (Medical Imaging with Deep Learning) 2025.

[Preprint] [Code]

[7] Uncovering communities of pipelines in the task-fMRI analytical space
Germani, E., Fromont, E.*, Maumet, C.*
2024 IEEE International Conference on Image Processing (ICIP), Abu Dhabi, United Arab Emirates, 2024, pp. 3044-3050. DOI : 10.1109/ICIP51287.2024.10647701.
Conference specialized in image processing, rank A-B. Presentation : Oral.

[Article] [HAL] [Code] [Slides]

International Conference Abstracts

[7] Exploring variability patterns in the task-fMRI analytical space
Germani, E., Fromont, E.*, Maumet, C.*
OHBM 2023 - 29th Annual Meeting of the Organization for Human Brain Mapping. Jul 2023, Montreal, Canada.
Presentation : Poster.

[Poster]

[8] FMRI data analysis : How does analytical variability vary with sample size ?
Germani, E., Maumet, C.
OHBM 2022 - 28th Annual Meeting of the Organization for Human Brain Mapping. Jun 2022, Glasgow, United Kingdom. pp.1-5.
Presentation : Poster.

[Poster] [Code]

National Conferences Abstracts

[9] Prédire l'évolution de la maladie de Parkinson à l'aide de données cliniques et d'IRM fonctionnelles : reproduction et robustesse d'une étude
Germani, E., Baghwat, N., Dugré, M., Gau, R., Sokolowski, A., Sharp, M., Poline, JB.*, Glatard, T.*
IABM 2024 - 2ème édition du Colloque Français d'Intelligence Artificielle en Imagerie Biomédicale. Mar 2024, Grenoble, France.
Presentation : Poster. **Best poster in Medical Imaging award.**

[Poster]

[10] Representation learning for more reproducible fMRI data analyses
Germani, E., Fromont, E.*, Maumet, C.*
IABM 2023 - Colloque Français d'Intelligence Artificielle en Imagerie Biomédical. Mar 2023, Paris, France.
Presentation : Poster.

[Poster]

Others

[11] Proceedings of the OHBM Brainhack 2022
Moia, S., Wang, H.-T., Heinsfeld, A. S., Jarecka, D., Yang, Y. F., Heunis, S., Svanera, M., De Leener, B., Gondova, A., Kim, S., Basavaraj, A., Bayer, J. M. M., Bayrak, R. G., Bazin, P.-L., Bilgin, I. P., Bollmann, S., Borek, D., Borghesani, V., Cao, T., Chen, G., De La Vega, A., Dresbach, S., Ehses, P., Ernsting, J., Esteves, I., Ferrante, O., Garner, K. G., Gau, R., Germani, E., Ghafari, T., Ghosh, S. S., Goodale, S. E., Gould Van Praag, C. D., Guay,

S., Gulban O. F., Halchenko, Y. O., Hanke, M., Herholz, P., Heuer, K., Hoffstaedter, F., Huang, R., Huber, R., Jensen, O., Keeratimahat, K., Kosciessa, J. Q., Lukic, S., Magielse, N., Markiewicz, C. J., Martin, C. G., Maumet, C., Menacher, A., Mentch, J., Monch, C., More, S., Muller, L., Muller-Rodriguez, Leonardo, Nastase, Samuel A., Nicolaisen-Sobesky, E., Nielson, D. M., Nolan, C. R., Paugam, F., Pinheiro-Chagas, P., Pinho, A. L., Pizzuti, A., Poldrack, B., Poser, B. A., Rocca, R., Sanz-Robinson, J., Sarink, K., Sitek, K. R, Spychala, N., Stirnberg, R., Szczepanik, M., Torabi, M., Toro, R., Urchs, S. G. W., Valk, S. L., Wagner, A. S., Waite, L. K., Waite, A. Q., Waller, L., Wishard, T. J., Wu, J., Zhou, Y., Bijsterbosch, J. D.
Aperture Neuro, 2024, Vol. 4. DOI : 10.52294/001c.92760.
Summary of projects presented at OHBM Brainhack 2022. Presentation of the Narps Open Pipelines project.

[Article]

[12] HCP multi-pipelines [dataset]
Germani, E., Fromont, E., Maurel, P.*, Maumet, C.*
PublicNeuro Datasets. DOI : 10.70883/gtkk1541.
Multi-pipeline dataset to facilitate the exploration of analytical variability across different contexts. The dataset is available on the Public-nEUro platform and can be accessed upon signing a Data User Agreement.

[Data]