

Fateme GHAYEM

2023–Now	Postdoctoral research fellow TANGRAM team, Inria, Nancy, France
CONTACT INFORMATION	Email: fatemeh.ghayem@inria.fr fateme.ghayem@gmail.com Homepage: https://ghayem.github.io
EDUCATION	Université Grenoble Alpes , Grenoble, France Ph.D. in Signal, Image, Parole, and Télécoms, GIPSA-lab, Oct 2017 – Nov 2020 - Thesis topic: <i>Optimal sensor placement for source extraction</i> - Advisor: Prof. Christian JUTTEN, Dr. Bertrand RIVET Sharif University of Technology , Tehran, Iran M.Sc., Electrical Engineering , Sept 2013 – Sept 2015 GPA: 17.06/20 - Thesis topic: <i>MR image reconstruction from highly partial Fourier samples</i> - Advisor: Prof. Farokh Marvasti Shiraz University , Shiraz, Iran B.Sc., Electrical Engineering , Sept 2009 – Sept 2013 GPA: 17.85/20 National Organization for Development of Exceptional Talents , Shiraz, Iran Diploma, Mathematics and Physics , Sept 2005 – Sept 2009 GPA: 19.60/20
RESEARCH INTERESTS	<ul style="list-style-type: none">– Machine learning and statistical signal processing in medical applications– Bayesian modeling, numerical optimization, and dictionary learning– Aneurysm detection with deep learning– Brain meta-analysis with large language models (LLM)– Independent component/vector analysis (ICA/IVA) for multi-subject fMRI study– Optimal sensor placement for source extraction
RESEARCH EXPERIENCES	<ul style="list-style-type: none">• Postdoctoral researcher (2025–Now), TANGRAM, Inria Nancy, France.<ul style="list-style-type: none">- Advisor: Dr. Erwan Kerrien- Research topic: Deep learning methods for aneurysm detection.- Summary: The project focuses on developing deep learning approaches for reliable aneurysm detection from MRA and related modalities. The objectives are to:<ul style="list-style-type: none">* Improve accuracy and robustness of aneurysm detection using advanced neural architectures;* Improve weakly annotated datasets for model training, as well as apply data augmentation techniques and multi-modal data analysis to address the data size limitation.

- **Postdoctoral researcher** (March 2023–2025), MIND, Inria Paris-Saclay, France.
 - Advisor: [Dr. Bertrand Thirion](#)
 - Co-advisor: [Dr. Demian Wassermann](#)
 - Research topic: Knowledge and representation integration on the brain
 - Summary:

The project aims to develop a novel approach for image representation in the context of brain imaging, enabling a more nuanced and flexible assessment of the associations between images and arbitrary queries, unconstrained by traditional “bag of words” limitations. In other words, we want to:

 - * Provide reliable knowledge from diverse brain studies;
 - * Address challenges such as lack of statistical power in individual studies, reproducibility, and terminology inconsistency;
 - * Provide insights into the relationship between brain structure and behavior.
- **Postdoctoral researcher** (August 2021–August 2022), [MLSP-Lab](#), University of Maryland, Baltimore County (UMBC), Maryland, USA.
 - Advisor: [Prof. Tulay Adali](#)
 - Research topics:
 - Dictionary learning for the identification of new interpretable patterns and discriminative features from brain functional network connectivity (FNC) obtained from ICA decomposition of multi-subject resting-state fMRI data for static and dynamic studies.
 - Brain graph neural networks (Brain-GNN) for the classification of healthy control and patients with different brain disorders, *e.g.*, Schizophrenia.
 - Constrained ICA and IVA for subgroup identification from multisubject fMRI Data.
 - Reproducibility and replicability in neuroimaging data analysis.
- **Research assistant** (2015–2017), DSP-lab, EE Department, Sharif University of Technology, Tehran, Iran.
 - Advisor: [Prof. Massoud Babaie-Zadeh](#)
 - Research topics: Dictionary learning for sparse representation, convex/non-convex optimization.

WORKSHOP [COGBASES workshop on open science methods for analyzing brain imaging data](#), Paris, France, October 2023.

SUMMER SCHOOL [PRAIRIE artificial intelligence summer school \(PAISS\)](#), Grenoble, France, July 2018.

TALKS

- **NeuroConText: Contrastive Learning for Neuroscience Meta-Analysis with Rich Text Representation**, *The British Council in Paris*, Paris, France, September 2025.
- **Exploring Brain Function and Structure: From Sparse Coding to Multimodal Meta-Analysis**, *TANGRAM team, Inria-Nancy*, Nancy, France, March 2025.
- **Exploring Brain Function and Structure: From Sparse Coding to Multimodal Meta-Analysis**, *Laboratoire de Physique de l'ENS de Lyon*, Lyon, France, February 2024.
- **Multi-subject fMRI Analysis for Brain Pattern Discovery and Subgroup Identification**, *MIND team, Inria-Saclay*, Paris, France, June 2024.

- **New Interpretable Patterns and Discriminative Features from Brain Functional Network Connectivity using Dictionary Learning**, *MIND team, Inria-Saclay*, Paris, France, September 2023.
- **Optimal Sensor Placement for Source Extraction**, *MIND team, Inria-Saclay*, Paris, France, June 2023.
- **Optimal Sensor Placement for Source Extraction**, *Diagnostic and Interventional Adaptive Imaging (IADI)*, Nancy, France, January 2023.
- **Optimal Sensor Placement for Source Extraction**, *Centre de Recherche en Automatique de Nancy (CRAN), Department of Biology, Signals and Systems*, Nancy, France, January 2021.

Google Scholar profile

PREPRINTS

1. **F. Ghayem**, R. Meudec, J. Dockès, B. Thirion, D. Wassermann, “NeuroConText: Contrastive Learning for Neuroscience Meta-Analysis with Rich Text Representation,” submitted to *Imaging Neuroscience*, July 2025. [Paper] [Codes]
2. R. Meudec, J. Dockès, **F. Ghayem**, D. Wassermann, B. Thirion, “Peaks2Image: Reconstructing fMRI Maps from Stereotactic Coordinates to Enhance Cognitive Meta-Analysis,” submitted to *Imaging Neuroscience*, August 2025. [Paper]

REFEREED JOURNAL PUBLICATIONS

1. **F. Ghayem**, B. Rivet, C. Jutten, R. Cabral Farias, “Robust sensor placement for signal extraction”, *IEEE Transactions on Signal Processing*, vol. 69, pp. 4513-4528, 2021.
2. **F. Ghayem**, M. Sadeghi, M. Babaie-Zadeh, S. Chatterjee, M. Skoglund, and C. Jutten, “Sparse signal recovery using iterative proximal projection”, *IEEE Transactions on Signal Processing*, vol. 66, no. 4, pp. 879–894, February 2018.

CONFERENCE PUBLICATIONS

1. R. Meudec*, **F. Ghayem***, J. Dockès, D. Wassermann, B. Thirion, “NeuroConText: Contrastive Text-to-Brain Mapping for Neuroscientific Literature”, *International Conference on Medical Image Computing And Computer Assisted Intervention (MICCAI)*, October 2024.
* **Equal contribution**
2. **F. Ghayem**, H. Yang, F. Kantar, S-J. Kim, V. D. Calhoun, T. Adali, “New Interpretable Patterns and Discriminative Features from Brain Functional Network Connectivity Using Dictionary Learning”, *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Rhodes island, June 2023.
3. H. Yang, **F. Ghayem**, B. Gabrielson, M. A. B. S. Akhonda, V. D. Calhoun, T. Adali, “Constrained independent component analysis based on entropy bound minimization for subgroup identification from multisubject fMRI data”, *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, June 2023.
4. H. Yang, MABS. Akhonda, **F. Ghayem**, Q. Long, VD. Calhoun, T Adali, “Independent Vector Analysis Based Subgroup Identification from Multisubject fMRI Data”, in *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, May 2022.
5. **F. Ghayem**, B. Rivet, Ch. Jutten, R. Cabral Farias, “Gradient-based algorithm with spatial regularization for optimal sensor placement”, in *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, May 2020.

6. **F. Ghayem**, B. Rivet, Ch. Jutten, R. Cabral Farias, “Optimal sensor placement for signal extraction”, in *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, May 2019.
7. M. Sadeghi, **F. Ghayem**, M. Babaie-Zadeh, S. Chatterjee, M. Skoglund, and C. Jutten, “L0Soft: ℓ_0 Minimization via Soft Thresholding”, in *Proceedings of the 27th European Signal Processing Conference (EUSIPCO)*, 2-6 September 2019.
8. **F. Ghayem**, M. Sadeghi, M. Babaie-Zadeh, and C. Jutten, “Accelerated dictionary learning for sparse signal representation”, in *13th International Conference on Latent Variable Analysis and Signal Separation, LVA/ICA*, Grenoble, France, 2017.
9. **F. Ghayem** and F. Rassaie, “Helical antenna to measure radiated power density around a BTS; Design and implementation”, in *third Asia-Pacific Conference on Antennas and Propagation (APCAP)*, July 2014.

CO-SUPERVISION	<p>I co-supervised three Ph.D. students in collaboration with Prof. Tulay Adali (University of Maryland, Baltimore County, USA), Prof. Jean-Christophe Pesquet (CentraleSupélec, Université Paris-Saclay, France), Prof. Vince D. Calhoun (Translational Research in Neuroimaging and Data Science, USA), and Dr. Seung-Jun Kim (University of Maryland, Baltimore County, USA) on the following projects:</p> <ul style="list-style-type: none"> - Brain graph neural networks (Brain-GNN) for the classification of healthy control and patients with different brain disorders, e.g. Schizophrenia. - ICA and IVA for subgroup identification from multisubject resting state fMRI Data. - Reproducibility and replicability in neuroimaging data analysis. 	
TEACHING	<p>Signal Processing</p> <ul style="list-style-type: none"> - 12 hours lectures + 24 hours practical sessions - Université de Lorraine <p>Signals and Systems</p> <ul style="list-style-type: none"> - 10 hours practical sessions - Responsible: Prof. M. Babaei-Zadeh, Sharif University of Technology <p>Digital Signal Proccessing II</p> <ul style="list-style-type: none"> - 10 hours practical sessions - Responsible: Prof. F. Marvasti, Sharif University of Technology <p>Signals and Systems</p> <ul style="list-style-type: none"> - 20 hours practical sessions - Responsible: Dr. M. Derakhtian, Shiraz University <p>Electromagnetics</p> <ul style="list-style-type: none"> - 20 hours practical sessions - Responsible: Dr. M. Derakhtian, Shiraz University <p>Electrical Circuit II</p> <ul style="list-style-type: none"> - 20 hours practical sessions - Responsible: Prof. M. A. Masnadi-Shirazi, Shiraz University 	<p>2024-2025</p> <p>2015</p> <p>2014</p> <p>2013</p> <p>2012</p> <p>2011</p>
QUALIFICATIONS	<p>I am qualified to serve as Maître de Conférences, Section 26 – Mathématiques appliquées et applications des mathématiques.</p>	

HONORS & AWARDS	<ul style="list-style-type: none"> - IEEE TMI Distinguished Reviewer Silver Level 2023 – 2024 2024 - Ph.D. scholarship (ranked 2), Université Grenoble Alpes, Grenoble, France. 2017 - Full travel grant (CHESS project), LVA/ICA workshop, Grenoble, France. 2017 - Bronze award in math competition among high school students, 2008 <p>Sharif University of Technology.</p> <ul style="list-style-type: none"> - Admitted to National Organization for Development of Exceptional Talents 2005 (NODET) as high school and pre-university school student.
COMPUTER SKILLS	<ul style="list-style-type: none"> • <i>Programming Languages and Softwares:</i> Python, PyTorch, MATLAB • <i>Typesetting:</i> \LaTeX • <i>Toolbox:</i> Nilearn, GIFT
COMMUNITY SERVICES	<p>Reviewer for the following journals and conferences:</p> <ul style="list-style-type: none"> - AAAI 2026 - ICML 2025 - NeurIPS 2024-2025 - Journal of Machine Learning Research 2024-2025 - IEEE Transactions on Machine Learning Research 2024-2025 - IEEE Transactions on Medical Imaging 2023-2026 - IEEE Transactions on Signal Processing 2019-2022 - IEEE Signal Processing Letters 2019, 2021, 2023 - International Conf. on Acoustics, Speech, and Signal Proc. (ICASSP) 2023 - European Signal Processing Conference (EUSIPCO) 2019-2021 - eNeuro 2022 - Machines 2022-2023
LANGUAGE PROFICIENCY	<ul style="list-style-type: none"> - English (Fluent) - French (Intermediate) - Persian (Native)
HOBBIES AND INTERESTS	Playing the violin, running, hiking, biking
REFERENCES	<ul style="list-style-type: none"> • Prof. Christian Jutten christian.jutten@gipsa-lab.grenoble-inp.fr • Prof. Massoud Babaie-Zadeh mbzadeh@sharif.edu • Dr. Bertrand Thirion bertrand.thirion@inria.fr • Dr. Demian Wassermann demian.wassermann@inria.fr • Dr. Bertrand Rivet bertrand.rivet@gipsa-lab.grenoble-inp.fr • Prof. Tulay Adali Adali@umbc.edu