

Fateme GHAYEM

Research scientist

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INFORMATION 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: *Optimal sensor placement for source extraction*
- 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: *MR image reconstruction from highly partial Fourier samples*
- 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 Statistical signal and image processing, Machine learning, Local/global optimization, Dictionary learning for sparse representation, Optimal sensor placement for source extraction, Independent component analysis (ICA) and independent vector analysis (IVA) for multi-subject resting-state fMRI study, Graph signal processing (GSP) and graph neural net (GNN).

RESEARCH EXPERIENCES

- **Postdoctoral researcher** (August 2021–August 2022), **MLSP-Lab**, University of Maryland, Baltimore County (UMBC), Maryland, USA.
 - Advisor: Prof. Tulay Adali
 - Research topic:
 - 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 - static and dynamic study
 - Interpretable brain graph neural net (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.

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

REFEREED [Google Scholar profile](#)

JOURNAL
PUBLICATIONS

1. **F. Ghayem**, B. Rivet, Ch. 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. 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.
2. **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.
3. **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.
4. M. Sadeghi, **F. Ghayem**, M. Babaie-Zadeh, S. Chatterjee, M. Skoglund, and C. Jutten, “L0Soft: L0 Minimization via Soft Thresholding,” in *Proceedings of the 27th European Signal Processing Conference (EUSIPCO)*, 2-6 September 2019.
5. **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.
6. **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.

SUBMITTED
PAPERS

1. **F. Ghayem**, H. Yang, F. Kantar, S.-J. Kim, VD. Calhoun, T. Adali, “New Interpretable Patterns and Discriminative Features from Brain Functional Network Connectivity Using Dictionary Learning,” submitted in *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2023.
2. H. Yang, **F. Ghayem**, B. Gabrielson, MABS. Akhonda, Q. Long, VD. Calhoun, T. Adali, “Constrained independent component analysis based on entropy bound minimization for subgroup identification from multisubject fMRI data,” submitted in *International Conf. on Acoustics, Speech, and Sig. Processing (ICASSP)*, 2023.

CO-SUPERVISION

I have been co-supervising 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:

- Interpretable brain graph neural net (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 fMRI Data
- Reproducibility and replicability in neuroimaging data analysis

TEACHING ASSISTANTSHIP	Signals and Systems	2015
	- Responsible: Prof. M. Babaei-Zadeh, Sharif University of Technology	
	Digital Signal Proccessing II	2014
	- Responsible: Prof. F. Marvasti, Sharif University of Technology	
	Signals and Systems	2013
	- Responsible: Dr. M. Derakhtian, Shiraz University	
	Electromagnetics	2012
	-Responsible: Dr. M. Derakhtian, Shiraz University	
	Electrical Circuit II	2011
	-Responsible: Prof. M. A. Masnadi-Shirazi, Shiraz University	
HONORS & AWARDS	- 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, Sharif University of Technology.	2008
	- 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> MATLAB, Python • <i>Typesetting:</i> L^AT_EX • <i>Toolbox:</i> GIFT 	
COMMUNITY SERVICES	Reviewer for the following journals and conferences:	
	- IEEE Transactions on Signal Processing	2019–2022
	- IEEE Signal Processing Letters	2019
	- European Signal Processing Conference (EUSIPCO)	2019–2021
	- eNeuro	2022
	- Machines	2022
LANGUAGE PROFICIENCY	- Persian (Native)	
	- English (Fluent)	
	- French (Intermediate)	
HOBBIES AND INTERESTS	Playing the violin	
	Running, hiking, biking	
REFERENCES	• Prof. Christian Jutten	christian.jutten@gipsa-lab.grenoble-inp.fr
	• Prof. Massoud Babaie-Zadeh	mbzadeh@sharif.edu
	• Prof. Tulay Adali	Adali@umbc.edu