Fateme GHAYEM

Research scientist

CONTACT INFORMATION

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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 Journal Publications

Google Scholar profile

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 (NODET) as high school and pre-university school student.	2005

Computer skills
- *Programming Languages and Softwares:* MATLAB, Python
- *Typesetting:* LaTeX
- *Toolbox:* 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. Tulay Adali — Adali@umbc.edu
- Prof. Christian Jutten — christian.jutten@gipsa-lab.grenoble-inp.fr
- Prof. Massoud Babaie-Zadeh — mbzadeh@sharif.edu