

# AMJAD SEYEDI

## Doctoral Researcher

 [amjadseyedi.github.io](https://amjadseyedi.github.io)  [linkedin.com/in/amjadseyedi](https://linkedin.com/in/amjadseyedi)  [github.com/AmjadSeyedi](https://github.com/AmjadSeyedi)  [seyedamjad.seyedi@umons.ac.be](mailto:seyedamjad.seyedi@umons.ac.be)  
 Depart. of Mathematics and Operational Research, Faculty of Engineering, University of Mons, Rue de Houdain 9, 7000 Mons, Belgium

### BRIEFLY

I am a Doctoral Researcher at the University of Mons, supervised by Prof. Nicolas Gillis. My current research sits at the intersection of Matrix Theory and Optimization, specifically developing matrix factorization and low-rank approximation methods for Trustworthy Machine Learning. I aim to leverage these mathematical tools to enhance robustness, interpretability, and fairness in high-dimensional data and network analysis. Previously, I was a Graduate Research Assistant at the University of Kurdistan, where I led the Algebraic Machine Learning Team (AMIL team) and focused on representation learning. I hold an MSc in Artificial Intelligence from the same institution, where my work with Dr. Parham Moradi and Dr. Fardin Akhlaghian focused on matrix factorization for semi-supervised learning and recommender systems. I also hold a Bachelor's degree in Software Engineering.

### RESEARCH INTERESTS

- **Machine Learning** : representation learning, deep learning, unsupervised learning
- **Trustworthy ML** : robustness, generalization, interpretability, fairness
- **Applications** : healthcare, recommender systems, remote sensing
- **Applied Mathematics** : linear algebra, optimization, low-rank approximation

### EDUCATION

PhD	<b>Mathematics &amp; Operational Research, UNIVERSITY OF MONS, BELGIUM, (Jun 2024 – )</b> ➢ Low-rank matrix factorization, machine learning, optimization ➢ Advisor : Prof. Nicolas Gillis.
Master	<b>Artificial Intelligence, UNIVERSITY OF KURDISTAN, SANANDAJ, IRAN, (Sep 2015 – Feb 2018)</b> ➢ Thesis title : A Graph-based Semi-Supervised Learning Approach for Multi-Label Classification. ➢ Advisors : Dr. Parham Moradi and Dr. Fardin Akhlaghian. ➢ Courses : machine learning, statistical pattern recognition, neural networks, advanced artificial intelligence, computer vision, digital image processing, distributed systems, and fuzzy sets & systems.
Bachelor	<b>Sofware Engineering, AMIRKABIR TECHNICAL COLLEGE, ARAK, IRAN, (Jan 2012 – Jun 2014)</b> ➢ Project title : Manufacturing and Setting up a Video Conferencing Software.
Associate	<b>Computer Software, TABRIZ TECHNICAL COLLEGE, TABRIZ, IRAN, (Jan 2009 – Jun 2011)</b> ➢ Supplementary courses in computer science and software engineering.

### EXPERIENCE

Thesis Advisor	<b>Artificial Intelligence (graduate), UNIVERSITY OF KURDISTAN, SANANDAJ, IRAN, (Sep 2020 -)</b> ➢ 12 master's students have graduated. I am currently advising one PhD student and one master's student. ➢ Topics : representation learning, deep learning, matrix factorization, semi-supervised learning, self-supervised learning, robust learning, and sparse coding. ➢ problems : data representation, data clustering, graph clustering, recommendation systems, link prediction, and feature selection.
Research Assist.	<b>Representation Learning, UNIVERSITY OF KURDISTAN, SANANDAJ, IRAN, (Sep 2019 – Jun 2024)</b> ➢ Topics : matrix factorization, distributionally robust learning, generalization, and adversarial training ➢ applications : image inpainting and recommendation systems.
Teaching Assist.	<b>Artificial Intelligence (graduate), UNIVERSITY OF KURDISTAN, (Jan 2019 – Jun 2024)</b> ➢ Advanced Concepts in Artificial Intelligence (Graduate), Spring 2023, Fall 2023 ➢ Nonnegative Matrix Factorization for Machine Learning (Graduate), Fall 2022 ➢ Pattern Recognition (Graduate), Spring 2019 – Spring 2023 ➢ Special Topics in Artificial Intelligence (Graduate), Fall 2021 ➢ lectures : Semi-supervised learning, Modern Machine Learning Paradigms, Nonnegative matrix factorizations, Transformer Networks
Lab Instructor	<b>Computer Lab (undergraduate), UNIVERSITY OF KURDISTAN, SANANDAJ, IRAN, (Fall 2019)</b> ➢ I had two 14-person classes on computer basics.

Preprint	<p><b>Robust log-based multi-label feature selection with dynamic label correlation and relevance-redundancy optimization</b>  M. Faraji, A. Seyed, and F. Akhlaghian Tab.  <i>Knowledge-Based Systems [Second Revision]</i>.</p> <p><b>Robust Asymmetric Encoder-Decoder Nonnegative Matrix Factorization for Hyperspectral Anomaly Detection</b>  S. Moradi, A. Seyed, W. Barkhoda, and F. Akhlaghian Tab.  <i>Neurocomputing [First Revision]</i>.</p> <p><b>Contrastive Calibration on Consensus and Complementary Multi-View Representations</b>  N. Jabari, A. Seyed, R. Mahmoodi, and F. Akhlaghian Tab.  <i>Pattern Recognition [First Revision]</i>.</p>
2026	<p><b>Semantic Encoder-Decoder Nonnegative Matrix Factorization with Kullback-Leibler Divergence</b>  S. Soleymanbaigi, A. Seyed, F. Daneshfar, and F. Akhlaghian,  <i>International Journal of Machine Learning and Cybernetics</i> 2026.</p> <p><b>Community Detection via Deep Motif-regularized Asymmetric Nonnegative Matrix Factorization</b>  H. Sohrabi, A. Seyed, P. Moradi, and Sh. Esmaeili.  <i>Engineering Applications in Artificial Intelligence</i> 2026.</p> <p><b>Distributionally robust nonnegative matrix factorization with self-paced adaptive multi-loss fusion</b>  W. Barkhoda, A. Seyed, N. Gillis, and F. Akhlaghian.  <i>Information Sciences</i>, Volume 728, 2026.</p> <p><b>Encoder-Decoder Nonnegative Matrix Factorization with <math>\beta</math>-Divergence for Data Clustering</b>  S. Soleymanbaigi, A. Seyed, F. Akhlaghian, and F. Daneshfar.  <i>Pattern Recognition</i>, Volume 171, 2026.</p> <p><b>Instance-wise distributionally robust nonnegative matrix factorization</b>  W. Barkhoda, A. Seyed, N. Gillis, and F. Akhlaghian.  <i>Pattern Recognition</i>, Volume 169, 2026.</p>
2025	<p><b>A Deep Latent Factor Graph Clustering with Fairness-Utility Trade-off Perspective</b>  S. Ghodsi, A. Seyed, T. Quy, F. Karimi, and E. Ntoutsi.  <i>2025 IEEE International Conference on Big Data</i>.</p> <p><b>A New Bi-level Deep Human Action Representation Structure Based on the Sequence of Sub-actions</b>  F. Akhlaghian, M. Ramezani, H. Afshoon, A. Seyed, and A. Moradyani.  <i>Neural Computing and Applications</i>, Volume 37, 2025, pages 985–1008.</p>
2024	<p><b>Diverse Joint Nonnegative Matrix Factorization for Attributed Graph Clustering</b>  A. Mohammadi, A. Seyed, F. Akhlaghian, and R. Pirmohamadiani.  <i>Applied Soft Computing</i>, Volume 164, 2024, pp. 112012.</p> <p><b>Enhancing Link Prediction through Adversarial Training in Deep Nonnegative Matrix Factorization</b>  R. Mahmoodi, A. Seyed, A. Abdollahpouri, and F. Akhlaghian.  <i>Engineering Applications in Artificial Intelligence</i>, volume 133, 2024, pp. 108641.</p> <p><b>Towards Cohesion-Fairness Harmony : Contrastive Regularization in Individual Fair Graph Clustering</b>  S. Ghodsi, A. Seyed, and E. Ntoutsi.  <i>Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)</i>, 2024.</p> <p><b>Orthogonal Encoder-Decoder Factorization for Unsupervised Feature Selection</b>  M. Mozafari, A. Seyed, R. Pirmohamadiani, and F. Akhlaghian.  <i>Information Sciences</i>, volume 663, 2024, pp. 120277.</p> <p><b>Multi-Label Feature Selection with Global and Local Label Correlation</b>  M. Faraji, A. Seyed, F. Akhlaghian, and R. Mahmoodi.  <i>Expert Systems with Applications</i>, volume 246, 2024, pp. 123198.</p> <p><b>Deep Asymmetric Nonnegative Matrix Factorization for Graph Clustering</b>  A. Hajiveiseh, A. Seyed, and F. Akhlaghian.  <i>Pattern Recognition</i>, volume 148, 2024, pp. 110179.</p>

2023	<b>Link Prediction by Adversarial Nonnegative Matrix Factorization</b> R. Mahmoodi, <b>A. Seyed</b> i, F. Akhlaghian, and A. Abdollahpouri. <i>Knowledge-based Systems</i> , volume 280, 2023, pp. 110998.	
	<b>Self-Supervised Semi-Supervised Nonnegative Matrix Factorization for Data Clustering</b> J. Chavoshinejad, <b>A. Seyed</b> i, and F. Akhlaghian. <i>Pattern Recognition</i> , volume 137, 2023, pp. 109282.	
	<b>Adversarial Elastic Deep Nonnegative Matrix Factorization for Matrix Completion</b> <b>A. Seyed</b> i, F. Akhlaghian, A. Lotfi, N. Salahan, and J. Chavoshinejad <i>Information Sciences</i> , volume 621, 2023, pp. 562-579.	
	<b>Deep Autoencoder-Like NMF with Contrastive Regularization and Feature Relationship Preservation</b> N. Salahan, F. Akhlaghian, <b>A. Seyed</b> i, and J. Chavoshinejad <i>Expert Systems with Applications</i> , volume 214, 2023, pp. 119051.	
2020	<b>Asymmetric Semi-Nonnegative Matrix Factorization for Directed Graph Clustering</b> R. Abdollahi, <b>A. Seyed</b> i, and M. R. Noorimehr <i>IEEE International Conference on Computer and Knowledge Engineering (ICCKE)</i> , 2020, pp. 323-328.	
2019	<b>Self-Paced Multi-Label Learning with Diversity</b> <b>A. Seyed</b> i, S. Ghodsi, F. Akhlaghian Tab, M. Jalili, and P. Moradi <i>Asian Conference on Machine Learning (ACML)</i> , 2019, pp. 790-805.	
	<b>Dynamic Graph-based Label Propagation for Density Peaks Clustering</b> <b>A. Seyed</b> i, A. Lotfi, P. Moradi, and N. N. Qader <i>Expert Systems with Applications</i> , Volume 115, 2019, pp. 314-328.	
2017	<b>A Weakly-Supervised Factorization Method with Dynamic Graph Embedding</b> <b>A. Seyed</b> i, P. Moradi, and F. Akhlaghian Tab <i>IEEE Artificial Intelligence and Signal Processing Conference (AISP)</i> , 2017, pp. 213-218.	
	<b>A Clustering-based Matrix Factorization Method to Improve the Accuracy of Recommendation Systems</b> Z. Shajarian, <b>A. Seyed</b> i, and P. Moradi <i>IEEE Iranian Conference on Electrical Engineering (ICEE)</i> , 2017, pp. 2241-2246.	
2016	<b>An Improved Density Peaks Method for Data Clustering</b> A. Lotfi, <b>A. Seyed</b> i, and P. Moradi <i>IEEE International Conference on Computer and Knowledge Engineering (ICCKE)</i> , 2016, pp. 263-268.	

## COMPUTER SKILLS

Operationg Systems	Microsoft Windows and Linux (ubuntu, centOS, fedora, and RedHat distributions)
Word processing & Presentation	Office suites, <b>L<small>A</small>T<small>E</small>X</b> , and Manim (animation engine for explanatory math videos)
Vector and raster softwares	Adobe Illustrator, Inkscape, Adobe Photoshop, and GIMP
Development Tools	Pycharm, Jupyter Notebook, Colab, Visual Studio, IntelliJ Idea, and Eclipse
Web design	HTML, CSS, and JavaScript

## PROGRAMMING LANGUAGES

2019 – present	Python, PyTorch, NumPy, and scikit-learn
2015 – 2020	MATLAB, linear algebra and visualization
2012 – 2015	JAVA, object-oriented software engineering and web development
2009 – 2015	C++   C#, Software Engineering and Web development
2007 – 2009	Basic   Visual Basic, Software Engineering

## REVIEWING ACTIVITIES

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- Artificial Intelligence Review
- Computers and Electrical Engineering
- Digital Signal Processing
- Engineering Applications of Artificial Intelligence
- Expert Systems with Applications
- Information Fusion
- Information Processing & Management
- Information Sciences
- International Conference on Acoustics, Speech, and Signal Processing 2026
- International Journal of Machine Learning and Cybernetics
- Journal of Computational and Applied Mathematics
- Journal of Information and Intelligence
- Knowledge-Based Systems
- Mathematics
- Medical Image Analysis
- Neurocomputing
- Pattern Recognition
- Scientific Reports
- Signal Processing

## REFERENCES

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**Nicolas Gillis**, *PhD supervisor*

Professor, Department of Mathematics & Operational Research, University of Mons, Belgium

@ [nicolas.gillis@umons.ac.be](mailto:nicolas.gillis@umons.ac.be)

**Fardin Akhlaghian**, *Master's thesis advisor and RA supervisor*

Associate Professor, Department of Computer Engineering, University of Kurdistan, Iran

@ [f.akhlaghian@uok.ac.ir](mailto:f.akhlaghian@uok.ac.ir)

**Parham Moradi**, *Master's thesis supervisor*

Senior Lecturer, Department of Computer Engineering, Victoria University, Australia

@ [parham.moradi@rmit.edu.au](mailto:parham.moradi@rmit.edu.au)