AMJAD SEYEDI
Doctoral Researcher

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BRIEFLY

I am pursuing my PhD in Matrix Theory and Optimization at the University of Mons under the supervision of Prof. Nicolas Gillis. Previously, as a graduate research assistant at the University of Kurdistan, I worked on representation learning with a focus on robustness and generalization. I also led the Algebraic Machine Learning Team (AML team), a group that explores fundamental methods in unsupervised machine learning. I have a Master's in Artificial Intelligence from the same university, where I worked with Dr. Parham Moradi and Dr. Fardin Akhlaghian on matrix factorization and low-rank approximation for applications such as semi-supervised learning, multi-label classification, and recommendation systems. I also have an Associate's and 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 — Mathematics & Operational Research, University of Mons, Belgium, (Jun 2024 –)
- Low-rank matrix factorization, machine learning, optimization
- Advisor : Prof. Nicolas Gillis.

Master — Artificial Intelligence, University of Kurdistan, Sanandaj, Iran, (Sep 2015 – Feb 2018)
- 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 — Sofware Engineering, Amirkabir Technical College, Arak, Iran, (Jan 2012 – Jun 2014)
- Project title : Manufacturing and Setting up a Video Conferencing Software.

Associate — Computer Software, Tabriz Technical College, Tabriz, Iran, (Jan 2009 – Jun 2011)
- Supplementary courses in computer science and software engineering.

EXPERIENCE

Thesis Advisor — Artificial Intelligence (graduate), University of Kurdistan, Sanandaj, Iran, (Sep 2020 -)
- 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. — Representation Learning, University of Kurdistan, Sanandaj, Iran, (Sep 2019 – Jun 2024)
- Topics : matrix factorization, distributionally robust learning, generalization, and adversarial training
- applications : image inpainting and recommendation systems.

Teaching Assist. — Artificial Intelligence (graduate), University of Kurdistan, (Jan 2019 – Jun 2024)
- 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 — Computer Lab (undergraduate), University of Kurdistan, Sanandaj, Iran, (Fall 2019)
- I had two 14-person classes on computer basics.

PUBLICATIONS

Preprint

Community Detection via Deep Motif-regularized Asymmetric Nonnegative Matrix Factorization
H. Sohrabi, **A. Seyedi**, P. Moradi, and Sh. Esmaeili.
[Second Revision].

Semantic Encoder-Decoder Nonnegative Matrix Factorization with Kullback-Leibler Divergence
S. Soleymanbaigi, **A. Seyedi**, F. Daneshfar, and F. Akhlaghian,
[Second Revision].

2026

Distributionally robust nonnegative matrix factorization with self-paced adaptive multi-loss fusion
W. Barkhoda, **A. Seyedi**, N. Gillis, and F. Akhlaghian.
Information Sciences, Volume 728, 2026.

Encoder-Decoder Nonnegative Matrix Factorization with β-Divergence for Data Clustering
S. Soleymanbaigi, **A. Seyedi**, F. Akhlaghian, and F. Daneshfar.
Pattern Recognition, Volume 171, 2026.

Instance-wise distributionally robust nonnegative matrix factorization
W. Barkhoda, **A. Seyedi**, N. Gillis, and F. Akhlaghian.
Pattern Recognition, Volume 169, 2026.

2025

A Deep Latent Factor Graph Clustering with Fairness-Utility Trade-off Perspective
S. Ghodsi, **A. Seyedi**, T. Quy, F. Karimi, and E. Ntoutsi.
2025 IEEE International Conference on Big Data.

A New Bi-level Deep Human Action Representation Structure Based on the Sequence of Sub-actions
F. Akhlaghian, M. Ramezani, H. Afshoon, **A. Seyedi**, and A. Moradyani.
Neural Computing and Applications, Volume 37, 2025, pages 985–1008.

2024

Diverse Joint Nonnegative Matrix Factorization for Attributed Graph Clustering
A. Mohammadi, **A. Seyedi**, F. Akhlaghian, and R. Pirmohamadiani.
Applied Soft Computing, Volume 164, 2024, pp. 112012.

Enhancing Link Prediction through Adversarial Training in Deep Nonnegative Matrix Factorization
R. Mahmoodi, **A. Seyedi**, A. Abdollahpouri, and F. Akhlaghian.
Engineering Applications in Artificial Intelligence, volume 133, 2024, pp. 108641.

Towards Cohesion-Fairness Harmony : Contrastive Regularization in Individual Fair Graph Clustering
S. Ghodsi, **A. Seyedi**, and E. Ntoutsi.
Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), 2024.

Orthogonal Encoder-Decoder Factorization for Unsupervised Feature Selection
M. Mozafari, **A. Seyedi**, R. Pirmohamadiani, and F. Akhlaghian.
Information Sciences, volume 663, 2024, pp. 120277.

Multi-Label Feature Selection with Global and Local Label Correlation
M. Faraji, **A. Seyedi**, F. Akhlaghian, and R. Mahmoodi.
Expert Systems with Applications, volume 246, 2024, pp. 123198.

Deep Asymmetric Nonnegative Matrix Factorization for Graph Clustering
A. Hajiveiseh, **A. Seyedi**, and F. Akhlaghian.
Pattern Recognition, volume 148, 2024, pp. 110179.

2023

Link Prediction by Adversarial Nonnegative Matrix Factorization
R. Mahmoodi, **A. Seyedi**, F. Akhlaghian, and A. Abdollahpouri.
Knowledge-based Systems, volume 280, 2023, pp. 110998.

Self-Supervised Semi-Supervised Nonnegative Matrix Factorization for Data Clustering
J. Chavoshinejad, **A. Seyedi**, and F. Akhlaghian.
Pattern Recognition, volume 137, 2023, pp. 109282.

Adversarial Elastic Deep Nonnegative Matrix Factorization for Matrix Completion
A. Seyedi, F. Akhlaghian, A. Lotfi, N. Salahian, and J. Chavoshinejad
Information Sciences, volume 621, 2023, pp. 562-579.

Deep Autoencoder-Like NMF with Contrastive Regularization and Feature Relationship Preservation
N. Salahian, F. Akhlaghian, **A. Seyedi**, and J. Chavoshinejad
Expert Systems with Applications, volume 214, 2023, pp. 119051.

2020 | **Asymmetric Semi-Nonnegative Matrix Factorization for Directed Graph Clustering**
R. Abdollahi, **A. Seyedi**, and M. R. Noorimehr
IEEE International Conference on Computer and Knowledge Engineering (ICCKE), 2020, pp. 323-328.

2019 | **Self-Paced Multi-Label Learning with Diversity**
A. Seyedi, S. Ghodsi, F. Akhlaghian Tab, M. Jalili, and P. Moradi
Asian Conference on Machine Learning (ACML), 2019, pp. 790–805.

Dynamic Graph-based Label Propagation for Density Peaks Clustering
A. Seyedi, A. Lotfi, P. Moradi, and N. N. Qader
Expert Systems with Applications,Volume 115, 2019, pp. 314-328.

2017 | **A Weakly-Supervised Factorization Method with Dynamic Graph Embedding**
A. Seyedi, P. Moradi, and F. Akhlaghian Tab
IEEE Artificial Intelligence and Signal Processing Conference (AISP), 2017, pp. 213-218.

A Clustering-based Matrix Factorization Method to Improve the Accuracy of Recommendation Systems
Z. Shajarian, **A. Seyedi**, and P. Moradi
IEEE Iranian Conference on Electrical Engineering (ICEE), 2017, pp. 2241-2246.

2016 | **An Improved Density Peaks Method for Data Clustering**
A. Lotfi, **A. Seyedi**, and P. Moradi
IEEE International Conference on Computer and Knowledge Engineering (ICCKE), 2016, pp. 263-268.

COMPUTER SKILLS

Operationg Systems	**Microsoft Windows** and **Linux** (ubuntu, centOS, fedora, and RedHat distributions)
Word processing & Presentation	Offce suites, LaTeX, 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

REFERENCES

Nicolas Gillis, *PhD supervisor*
Professor, Department of Mathematics & Operational Research, University of Mons, Belgium
@ 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

Parham Moradi, *Master's thesis supervisor*
Senior Lecturer, Department of Computer Engineering, Victoria University, Australia
@ parham.moradi@rmit.edu.au