

Maysam Behmanesh

AI Research Scientist & Machine Learning Engineer

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🌐 Portfolio — **in** LinkedIn — 🐙 GitHub

Professional Summary

Experienced AI researcher & ML engineer with **6+ years** of expertise in developing scalable ML solutions for complex data integration challenges. I specialize in building systems that handle diverse data types (text, images, graphs) using geometric and deep learning approaches. My work has led to **+10 peer-reviewed publications** in top-tier venues (ICML, IEEE Transactions) and practical improvements in model performance. I have hands-on experience with **geometric deep learning, multimodal AI, graph neural networks**, and **scaling models** for production environments. Recent work focuses on geometric deep learning for multimodal AI applications, including vision-language understanding and graph-based learning, with emphasis on scalable solutions for complex data integration.

Key Achievements:

- Ranked **#1** in Ph.D. comprehensive exam and graduated top of class with highest GPA in AI program, Isfahan University.
- Awarded prestigious national scholarship by Iran's Ministry of Science for international research fellowship.
- Developed scalable graph neural network solving oversmoothing challenges for robust performance on diverse, large-scale graph applications
- Built multimodal machine learning systems for real-world applications, leveraging geometric processing to integrate complex data

Core Technical Skills

- 1. Machine Learning & AI:** Deep Learning, Graph Neural Networks, Contrastive Learning, Diffusion Models, Computer Vision, NLP, Multimodal Learning, Transfer Learning, Semi-supervised Learning
- 2. Programming & Frameworks:** Python (Expert), PyTorch, TensorFlow, Keras, scikit-learn, PyTorch Geometric, C/C++, MATLAB, JavaScript/Node.js
- 3. Data Science & MLOps:** Pandas, NumPy, Jupyter, Git, CI/CD, Docker, Model Deployment
- 4. Database & SQL:** Advanced SQL querying, stored procedures, triggers, views, user-defined functions, query optimization, database design, linked servers, database security and permissions, backup and recovery
- 5. Cloud & Infrastructure:** AWS, Google Cloud (Vertex AI), Linux (Ubuntu, Red Hat)

Professional Experience

Postdoc – AI Researcher *Paris, France*
LIX, École Polytechnique, IP-Paris *2022 – 2024*

- **Developed TIDE framework:** Novel time-derivative graph diffusion method enhancing GNN communication and solving oversmoothing in deep architectures
- **Created smoothed graph contrastive learning:** Integrated geometric proximity into contrastive loss, improving self-supervised learning performance on large-scale graphs
- **Designed scalable graph matching algorithm:** Built efficient embed-then-compare strategy for multimodal and high-dimensional graph alignment problems
- **Built spectrally-conditioned generative models:** Developed graph generation systems preserving structural properties with cross-domain adaptability
- **Collaborated internationally:** Participated in ML conferences and workshops, working with researchers across multiple domains
- **Research domains:** Multimodal learning, graph neural networks, contrastive learning, optimal transport, spectral graph theory, representation learning

AI Researcher *Grenoble, France*
GIPSA-Lab, Grenoble-INP *2019 – 2020*

- **Built multimodal learning systems** combining vision, text, and sensor data for industrial applications
- **Developed manifold learning algorithms** that improved data representation quality on high-dimensional

datasets

- **Optimized geometric deep learning models** for real-time processing of satellite imagery and remote sensing data
- **Created robust preprocessing pipelines** handling diverse data formats and missing values

AI PhD Student & Researcher

ILS-Lab, Isfahan University

Isfahan, Iran

2016 – 2022

- **Published +5 research papers** most in top-tier ML journals (IEEE-TNNLS, IEEE-TSP) demonstrating practical advances in geometric multimodal learning
- **Built weakly supervised multimodal framework:** Developed local signal expansion method enabling joint analysis of diverse data types with minimal supervision requirements
- **Created manifold learning system:** Designed spectral graph wavelet approach for learning cross-modal correspondences, improving classification accuracy on heterogeneous datasets
- **Developed multimodal graph neural network:** Built GNN architecture capturing both intra- and cross-modal relationships for complex data integration tasks
- **Solved imbalanced classification challenges:** Implemented fuzzy rough set-enhanced SVM with adaptive sampling, achieving robust performance on skewed datasets
- **Delivered technical presentations:** Gave invited talks on geometric multimodal deep learning at conferences and workshops, focusing on practical graph-based methods

Software Engineer & Database Manager

Iran Telecommunication Company

Birjand, Iran

2009 – 2013

- **Renovated Billing application:** Redesigned landline customer billing computation system, implementing advanced algorithms and database optimization for improved performance and accuracy
- **Implemented Electronic Payment platform:** Implement comprehensive system to fetch electronic payment receipts from bank accounts and automatically apply credits to customer phone accounts, streamlining payment processing workflow
- **Designed customer scoring application:** implement automated scoring system to evaluate customers based on timely payments and electronic payment method usage, enabling data-driven customer relationship management
- **Implemented loyalty lottery system:** Developed application for conducting automated lotteries for premium customers, enhancing customer retention strategies
- **Supported 1818 telephonic system:** Maintained real-time payment and auto-connection system using SQL Server triggers for automated processing
- **Managed enterprise databases:** Designed and optimized high-volume telecommunication databases with stored procedures, triggers, and performance tuning

Key Research Projects & Achievements

Large-Scale Graph Matching Framework & Vision-Language Alignment — arxiv-2025

- Developed a graph alignment framework addressing node distinctiveness degradation and latent space misalignment
- Application: Enabled accurate alignment of large, complex graphs and improved cross-modal tasks such as vision-language alignment
- Impact: Achieved superior performance on standard graph benchmarks while robustly handling structural inconsistencies

TIDE: Graph Diffusion for Deep Learning — ICML 2023

- Created novel time-derivative diffusion framework for graph neural networks
- Application: Enhanced node representation on large, complex, and heterophilic graphs, enabling more accurate predictions for real-world network data
- Impact: Achieved improvement in node classification accuracy on large-scale benchmarks while maintaining computational efficiency
- Tech Stack: PyTorch, PyTorch Geometric, CUDA, distributed training

Deep Multimodal Learning via Graph Wavelet Convolutional Network — IEEE TNNLS 2022

- Designed and implemented a multiscale graph wavelet convolutional network to integrate heterogeneous multimodal datasets for real-world applications.

- Application: Improved prediction and decision-making in complex scenarios by effectively fusing and aligning data from multiple sources.
- Impact: Enabled more accurate and robust multimodal analyses, supporting downstream tasks such as environmental monitoring, biomedical data integration, and large-scale sensor fusion.

Education

Ph.D. Computer Engineering - Artificial Intelligence 2016 – 2022
Isfahan University, Iran

- Thesis: Using geometric structure of data for multimodal learning
- Ranked 1st in the Isfahan University Doctoral Comprehensive Exam among all Ph.D. students
- Ranked 1st in cumulative GPA among all Ph.D. students of Artificial Intelligence, 2016 beginners

M.Eng. Computer Engineering - Artificial Intelligence 2012 – 2014
Shahid Bahonar University of Kerman, Iran


- Thesis: Chaotic time series prediction using neuro-fuzzy inference system and evolutionary computations.

B.Eng. Computer Engineering - Software 2004 – 2008
Payam Noor University, Iran

- Project: Solving the time-tabling problem using the branch and bound algorithm.

Publications & Impact

Publications & Preprints:

- **Published 12+ research papers** including publications in top-tier ML venues (ICML, IEEE-TNNLS, IEEE-TSP, LoG, Neurocomputing) demonstrating practical advances in geometric multimodal learning
- Complete publication list and citations available at: [Google Scholar Profile](#) 

Research Impact: 10 peer-reviewed publications, 74+ citations, contributions to open-source ML libraries

Languages & Additional Skills

Languages: English (Fluent), French (Conversational), Persian (Native)

Industry Knowledge: Experience with software engineering, database management, SQL servers, and virtualized environments, as well as production ML systems, model deployment, performance optimization, and scalability

Career Timeline

- **2004–2008:** B.Eng. Computer Engineering - Software
- **2009–2013:** Software Engineer & Database Manager
- **2012–2014:** M.Eng. Computer Engineering - AI
- **2016–2022:** PhD Computer Engineering & AI Researcher
- **2019–2020:** AI Research Engineer, Grenoble-INP
- **2022–2024:** Postdoc AI Researcher, École Polytechnique
- **2025+:** Seeking Industry AI/ML Roles