Yaser Gholizade Atani

University of Catania (Italy)

Summary

I am a researcher and machine learning engineer with extensive experience in working with diverse types of data, ranging from medical imaging and object detection to language models and textual data analysis. My academic and professional background combines applied mathematics, computer vision, and explainable artificial intelligence (XAI). Over the past years, I have contributed to research and industrial projects across Italy, France, and Iran, focusing on deep learning, anomaly detection, and spatial as well as linguistic data processing. My strong proficiency in Python and MATLAB, together with a solid foundation in mathematical modeling and algorithm design, enables me to develop innovative and effective solutions for complex problems in data science, computer vision, and causal machine learning.

Skills

Programming	C++ (Basic), R, Python, MATLAB
Python Libs	TensorFlow, PyTorch, scikit-learn, NumPy, Pandas
AI & ML	Deep Learning, XAI, Causal ML, Computer Vision, NLP
Mathematical & Analytical	Statistical Analysis, Numerical Analysis, Optimization, Differential Equations
Documentation	LaTeX, Scientific Writing

Education

2021-2024 **Ph.D. in Computer Science**, *University of Catania*, Catania, Italy.
Thesis: Explainable Artificial Intelligence (XAI) in Advancing Data Science

2012-2017 **Ph.D. in Applied Mathematics**, *Azarbaijan Shahid Madani University*, Tabriz, Iran, *GPA – 18.75/20*.
Thesis: Edge Detection Based on B-spline Wavelets.

2009–2012 **M.Sc. in Applied Mathematics**, *University of Tabriz*, Tabriz, Iran, *GPA – 18.56/20*.
Thesis: A Wavelet-MRA-based Adaptive Semi-Lagrangian Method for the Relativistic Vlasov-Maxwell System.

Funded Projects

2017-2019 **Review and implement neural network-based algorithms and deep learning in object detection (in Tehran urban managment)**, Funded by National Elite Foundation,Tehran, Iran

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2016-2017 **Design and evaluation of decision support system to predict spinal deformity in idiopathic scoliosis using image processing techniques**, Image processing laboratory, Azarbaijan Shahid Madani University, Tabriz, Iran

2016-2017 **Comparison of the effect of lumbar segmental stabilization exercises and general exercises on radiologic criterias and clinical findings in patients with grade I spondylolisthesis**, Image processing laboratory, Azarbaijan Shahid Madani University, Tabriz, Iran

Research and Work Experience

2024-2025 **Post-Doctoral Researcher** in Computer Science, University of Catania, Catania, Italy

Project: Real-time processing of positioning data coming from fixed cameras and from mobile GNSS sensors

2023 **Visiting PhD Researcher** at University of Paris (LIPADE), Paris, France

Project: Global Explainability of Deep Learning Algorithms in Data Series Analysis.

2019-2021 **Machine Learning Engineer** at Magfa

Project: Automated Web Crawling of Iranian Websites and Anomaly Detection for Unusual Activities (e.g., illegal gun sales, counterfeit logo usage) using Machine Learning and Deep Learning Algorithms.

2017-2019 **AI Researcher** at Iran National Elites Foundation

Project: Object Detection based on Deep Learning

2015-2016 **Visiting PhD Researcher** at University of Catania (IPLab), Catania, Italy

Project: Breast Shape Parametrization Through Planar Projections (using PCA)

2013-2021 **Part-time lecturer** at Azarbaijan Shahid Madani University, Shahid Beheshti University of Medical Sciences, Islamic Azad University, University of Applied Science and Technology, and University College of Takestan

Publications

2025 *Motion-Based Track-to-Track Association for Early Identifying GNSS-Equipped Road Users in Visual Tracking Systems*, Submitted

2025 *The Role of Explainable Artificial Intelligence in Data Science [Il Ruolo dell'Intelligenza Artificiale Esplicabile nella Scienza dei Dati]*, hdl:20.500.14242/285208

2024 *Pre-pregnancy BMI, Gestational Weight Gain, and Telomere Length in Amniotic Fluid: a Causal Graph Analysis*, Scientific Reports - Nature

2024 *Robust NeRF-based Digital Twins*, IEEE COMSOC MMTC Communications - Frontiers

2023 *Applicazione di modelli causali per la valutazione della relazione tra aumento di peso gestazionale e lunghezza dei telomeri: risultati della coorte mamma e bambino.*, Oral presentation at the National Public Health Conference Extraordinary SItI, Cernobbio, Como, Italy, 12- 14 October 2023.

2023 *Feature Relevance in Classification of 3D Stone from Ancient Wall Structures*, International Workshop on Pattern Recognition for Cultural Heritage (PatReCH), Udine, Italy

2023 *Project "Wall facing Automatic Image Identification Laboratory" – W.A.L.(L)*, EUROGRAPHICS Workshop on Graphics and Cultural Heritage (2023)

2017 *The existence and numerical solution for a k-dimensional system of multi-term fractional integro-differential equations*, Nonlinear Analysis: Modelling and Control.

2016 *Breast Shape Parametrization through Planar Projections*, Advanced Concepts for Intelligent Vision Systems, Springer.

2016 *Theoretical study of tetrahedrane derivatives*, Journal of Physical and Theoretical Chemistry of Islamic Azad University of Iran.

2016 An Edge Detection Scheme with Legendre Multiwavelets, 46rd Annual Iranian Mathematics Conference, Yazd, Iran, (In English), *Speaker: Yaser Gholizade Atani.*

2015 *Edge Detection with Hessian Matrix Property Based on Wavelet Transform*. Journal of Sciences, Islamic Republic of Iran.

2014 *The Legendre Wavelet Method for Solving Singular Integro-differential*, Computational Methods for Differential Equations.

2014 Edge Detection Based on Wavelet and Gradient Vector Information, Caucasian Mathematics Conference I, Tbilisi, Georgia.

2014 Density Estimation Based on Biorthogonal Wavelets, The 5th Mathematical Conference of PNU of Benis, Iran.

2013 *Studying the Behavior of Solutions of a Second-Order Rational Difference Equation and a Rational System*, International Journal of Mathematical Modeling & Computations.

2012 Investigation of Solving a Series of Fractional Dynamic Systems, 43rd Annual Iranian Mathematics Conference, Tabriz, Iran (In Persian).

2012 Orthogonal Vector-Valued Wavelets with Dilation Factor 2, 43rd Annual Iranian Mathematics Conference, Tabriz, Iran (In Persian).

2012 Changes resulting from a congruent elastic parallel elastic shell under constant force, The 1st National Conference on Mathematics and its Application in Engineering Sciences, Joibar, Iran (In Persian).

2011 *Multiple Periodic Solutions for a Class of Non-Autonomous and Convex Hamiltonian Systems*, International Journal of Mathematical Modeling & Computations.

2011 Finite Dynamical Systems on Z_p Field, 42nd Annual Iranian Mathematics Conference, Rafsanjan, Iran, (In Persian).

Workshops and Summer Schools

2024 IEEE SPS/EURASIP Summer School on Signal Processing, Capri (Naple), Italy

2023 IEEE SPS/EURASIP Summer School on Metaverse Technologies, Cagliari, Italy

2023 AR, VR and Haptics as novel tools for e-Learning (8 hours), University of Siena, Siena, Italy

2022 International Computer Vision Summer School (ICVSS 2022), (30 hours), Sicily, Italy

2013 Image Watermarking and Steganalysis Systems (17 hours), Research Center of Intelligent Signal Processing, Tehran, Iran

Book Translation

2019 Introduction to Numerical Methods and Matlab Programming for Engineers (To Persian), Qazvin Islamic Azad University, Qazvin, Iran.

Academic Teaching

- Statistics and Probability
- Advanced Statistical Analysis
- Differential Equations
- Calculus I and II
- Numerical Analysis
- Engineering Mathematics

- Disceret Mathematics
- Operation Research
- MATLAB Programming

Languages

Persian	Mothertongue
English	Good
Italian	A1

Research Interests

- Explainable AI and Interpretation Machine Learning
- Neural Network and Deep Learning
- Computer Vision, Pattern Recognition and Object Detection
- Data Series Analysis
- Medical Data Analysis
- Causal Machine Learning