Alireza Norouziazad

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Summary

AI/ML Research Scientist with expertise in deep learning, computer vision, and medical imaging applications. Currently pursuing Ph.D. with 4 filed **patents** and **16+** publications in high-impact journals **(IF: up to 15.1)**. Specialized in developing novel AI architectures for healthcare diagnostics, wearable biosensors, and medical image analysis. Proven ability to translate research into practical solutions with industry experience.

Experience

AI & ML Expert Sep 2025–Present
WearDOXX Toronto, Canada
– Researching, developing, and implementing machine learning and deep learning models for healthcare applications
– Responsible for data preprocessing, model design, optimization, training, evaluation, and deploying AI solutions into production
– Collaborating with cross-functional teams to integrate AI technologies into real-world healthcare products and services

Deep Learning Research Assistant Sep 2024–Present
Mitacs Vancouver, British Columbia (Remote)
– Developing and validating AI-driven medical technologies for clinical applications
– Designing data pipelines, curating multimodal datasets, and implementing deep learning architectures for biomedical signals and imaging
– Conducting end-to-end experimentation from hypothesis formulation to model training, benchmarking, and deployment
– Collaborating with clinicians and engineers to refine system requirements and ensure scientific rigor in research outputs

Deep Learning Associate Researcher May 2024–Sep 2024
Scanbo Vancouver, British Columbia (Remote)
– Contributing to innovative healthcare solutions through advanced AI technologies
– Developing AI models for diagnostic methods enhancement and patient care improvement
– Performing data analysis, model development, and collaborating with multidisciplinary teams on cutting-edge healthcare initiatives

Graduate Research Assistant Jan 2024–Present
York University Toronto, Canada
– Medical Imaging Software: Developed AI-powered software capable of 2D/3D image segmentation, classification, and automated clinical report generation
– Novel Segmentation Models: Designed a modified U-Net based model and a novel loss function for deep medical image segmentation, achieving significantly improved performance across multiple datasets
– 3D Reconstruction: Implemented techniques for reconstructing 3D medical volumes by fusing 2D plane predictions with lightweight models
– Neurodegenerative Disease Detection: Designed a Smart Goggle Device for early detection of Alzheimer's, Parkinson's, and Epilepsy using retinal image processing and gait analysis
– Adversarial Augmentation: Created adversarial augmentation strategies to increase dataset diversity and model robustness in medical imaging tasks

Education

Doctor of Philosophy in Computer Science Jan 2024–Present
York University GPA: A+ Toronto, Canada
Supervisor: Prof. Razieh Salahandish
Thesis: Computational tools and machine learning to simulate and predict drug-target interactions and behavior of complex biological systems

Master of Science in Computer Engineering Sep 2020–Sep 2023
University of Tehran GPA: A+ Tehran, IR
Thesis: Fuzzy Particle Swarm Method-based Algorithm for Optimal Design and Automatic Generation of Artificial Neural Network

Projects

Smart Medical Imaging & Diagnostics Jan 2024–Present
York University
– Development of an AI-powered medical imaging software for 2D/3D image segmentation, classification, and automated clinical report generation
– Reconstruction of 3D medical volumes using novel recombination techniques by slicing volumetric datasets into 2D planes and fusing outputs
– Design and implementation of a novel loss function for deep medical image segmentation, achieving significantly improved model performance
– Development of modified UNET-based model for early detection of tumors in 3D MRI datasets

Wearable Biosensors & Diagnostic Platforms Jan 2024–Present
York University
– Design and development of Smart Goggle Device for early detection of neurodegenerative diseases (Alzheimer's, Parkinson's, Epilepsy)
– Development of electrochemical multiplexed lateral flow rapid testing platforms for detection and quantification of blood parameters
– Creating a wearable biodiagnostic platform for early detection of breast cancer through analysis of inflammatory biomarkers in sweat samples
– Development of optimization algorithms based on PSO for medical dataset analysis

Patents

– Salahandish, R., **Norouzi, A.**, et al. "System and Method for Multimodal Medical Imaging Analysis and Reporting via Slice-Based Segmentation, Recombination, and Domain-Specific Language Models" (US PATENT)
– Salahandish, R., Haghayegh, F., **Norouzi, A.**, et al. "Geometrically Enhanced Lateral Flow Immunoassays for Quantitative Assessment of Biomarkers in Point-of-Need Applications" (WO PATENT)
– Salahandish, R., et al. "All-in-One Integrated Multiplex Lateral Flow Immunoassay Platform for Quantitative, AI-Assisted Point-of-Care Detection" (US PATENT)
– Salahandish, R., et al. "A Wearable Sweat-Based Diagnostic Patch for Real-Time Self-Screening of Cancer Biomarkers" (US PATENT)

Publications

– **Norouziazad, A.**, et al. "Robust Colonoscopy Polyp Segmentation Using Dynamic-Nu T-Loss with Multi-Scale and Uncertainty-Aware Adaptation" Frontiers in medicine (2026, IF:3.0)
– **Norouziazad, A.**, et al. "Unified Metaheuristic Channel Selection Framework for Medical Image Segmentation" Journal of Machine Intelligence and Data Science (JMIDS)
– **Norouziazad, A.**, et al. "Adaptive Student's T-Loss with Multi-Scale Uncertainty Modeling for Reliable Polyp Detection" (EECSS 2025)
– **Norouziazad, A.**, et al. "Optimized DeepLabV3+ for Clinical Data Analysis through Advanced Particle Swarm Optimization-Based Channel Selection" Advanced Intelligent Systems (2025, IF:7)
– **Norouziazad, A.**, et al. "Grey Wolf Optimizer Enhances Adaptive Atrous Spatial Pyramid Pooling for Efficient Multi-Scale Feature Selection in Medical Image Segmentation" (AMIA-VR 2025)
– **Norouziazad, A.**, et al. "Breast Cancer Segmentation Using a Modified U-Net with Dynamic Whale Optimization Algorithm (DWOA) Channel Selection" (MVML 2025)
– Haghayegh, F., Haghani, E., **Norouziazad, A.**, et al. "Integrating Advanced Microfluidic Lateral Flow Systems with a Finger-Prick Blood Collection Cartridge to Create an All-in-One Platform for Point-of-Care Diagnostics" Biosensors and Bioelectronics"
– Haghayegh, F., **Norouziazad, A.**, et al. "Revolutionary Point-of-Care Wearable Diagnostics for Early Disease Detection and Biomarker Discovery through Intelligent Technologies" Advanced Science (2024, IF:15.1)
– Maydanchi, M., Ziaei, A., Basiri, Mi., **Norouziazad, A.**, et al. "Comparative Study of Decision Tree, AdaBoost, Random Forest, Naïve Bayes, KNN, and Perceptron for Heart Disease Prediction" (IEEE SoutheastCon 2023)
– Boreiri, Z., **Norouziazad, A.**, Ghodousian, A. "A Convolutional Neuro-Fuzzy Network Using Fuzzy Image Segmentation for Acute Leukemia Classification" (The 27th International Computer Conference, IEEE, 2022)
– Boreiri, Z., **Norouziazad, A.**, Majd, N. "Optimized Quantum Circuits in Quantum Image Processing Using Qiskit" (2022 International Conference on Machine Vision and Image Processing (MVIP), IEEE, 2022)
– Ghodousian, A., **Norouziazad, A.**, Boreiri, Z. "FRE paths for finding the minimal solutions of the linear optimization problems subjected to Einstein-product-FREs" (The 3rd International Conference on Challenges and New Solutions in Industrial Engineering, Management and Accounting, 2022)
– Boreiri, Z., **Norouziazad, A.** "A Novel Consensus Protocol in Blockchain Network based on Proof of Activity Protocol and Game Theory" (The 27th International Conference on Web Research (ICWR), IEEE, 2022)
– Ghodousian, A., **Norouziazad, A.**, Amiri, H. "Log-sum-exp optimization problem subjected to Lukasiewicz fuzzy relational inequalities" (The 1st National Conference on Optimization and New Solution Methods, 2021)
– Ghodousian, A., Amiri, H., **Norouziazad, A.** "On the resolution and Linear programming problems subjected by Aczel-Alsina Fuzzy relational equations" (The 14th International Conference of Iranian Operations Research Society, 2021)
– Ghodousian, A., Amiri, H., **Norouziazad, A.** "A global optimal solution for the weighted power mean programming problem constrained with fuzzy relational equalities" (The 52nd Annual Iranian Mathematics Conference, 2021)

Skills

Python ▪ PyTorch ▪ TensorFlow ▪ Keras ▪ OpenCV ▪ MATLAB ▪ C/C++ ▪ Docker ▪ Git ▪ Medical Imaging ▪ Computer Vision ▪ Deep Learning ▪ Neural Networks ▪ Optimization Algorithms ▪ Image Segmentation ▪ 3D Reconstruction ▪ Wearable Devices ▪ Biomedical Signal Processing ▪ Fuzzy Logic Systems

Honors & Teaching

Honors
– **Ph.D. Fellowship**: Awarded full funding for doctoral studies at York University covering tuition and living expenses (2024–Present)
– **Mitacs Accelerate Internship**: Granted two-year research internship with **$90,000 CAD** funding to develop AI-driven medical technologies for clinical applications (2024–2026)
– Distinguished M.Sc. Student Award for outstanding academic achievements, holding the **Second-rank** position in major (University of Tehran)
– Member of The National Organization for Development of Exceptional Talents (NODET)

Teaching Experience
York University: Artificial Intelligence, Object Oriented Programming, Electrical Circuits, Discrete Mathematics for Engineers, Introduction to Artificial Intelligence
University of Tehran: Operating Systems, Big Data Systems, Data Structures, Nonlinear Optimization, Quantum Computing, Randomized Algorithms, Graph and Network Algorithms