Reza M. Asiyabi

Based in **Edinburgh, UK** | Right to Work: **Global Talent Visa** (no sponsorship required)

https://reza-asiyabi.github.io/ | Reza.asiyabi@ed.ac.uk & Reza.m.asiyabi@gmail.com | +44 7777 93 3494

Summary

ML/AI Specialist | Complex Neural Architectures | Physics-Aware & Explainable AI
Applied AI research scientist with a PhD and over five years of experience designing deep learning architectures and scalable ML systems. Specialized in developing interpretable, physics-informed, and complex-valued neural networks for high-dimensional and multi-modal data. Proven impact across collaborative research environments including the European Space Agency, Stanford University, and the University of Edinburgh. Now focused on contributing to Interpretable and safe AI, foundational model research, pretraining strategies, and scalable infrastructure for next-generation AI systems.

Core Skills

Programming and Frameworks:

- **Languages:** Python (primary), R, MATLAB – Implementation on Cloud and High Performance Computing (HPC) systems
- **Deep Learning Frameworks:** PyTorch, TensorFlow, Keras, Transformers, TorchGeo, TerraTorch
- **Scientific/ML Libraries:** NumPy, SciPy, OpenCV, Scikit-Learn, Pandas, Matplotlib, Pillow

AI / ML:

- Deep Learning (Transformers, CNNs, Autoencoder)
- Physics-Informed and Interpretable AI
- Neural Architecture Design
- Foundation Models & Embedding Techniques
- Generative Models (e.g., GANs, VAEs)
- Reinforcement Learning
- Complex-Valued Neural Networks
- Multi-Modal Learning & Data Fusion
- Neural Data Compression
- Computer Vision / Image Processing

Domain Expertise:

- **EO Data Processing:** SNAP, Google Earth Engine (GEE), ENVI, PolSARpro, GDAL
- **GIS & Mapping:** QGIS, ArcGIS, PCI Geomatica, AutoCAD, eCognition
- **Domains:** Earth Observation, Synthetic Aperture Radar (SAR), Multispectral, LiDAR, Geospatial Intelligence

Languages: English (C1), Persian (Native), Turkish (Native)

Professional Experiences

Postdoctoral Research Associate (PDRA) – Aug 2024 to Present
The University of Edinburgh – National Center for Earth Observation (NCEO), Edinburgh, UK

- Lead Development of domain-aware AI models for biomass estimation using EO data to improve prediction bias, explainability, physics-awareness, and spurious learning resistance of the model (SECO Project).

Postdoctoral Research Assistant – Jan 2024 to Jul 2024
Stanford University / Stockholm School of Economics, (Remote)

- Remote work with the Center for Food Security and the Environment (FSE) at Stanford University on the development of novel remote sensing methods to detect and track economic activity of local markets in low-income countries (MAI project).

AI Specialist – Jan 2022 to Jan 2023
European Space Agency (ESA) funded project - Adaptive SAR Signal Compression Through Artificial Intelligence (ARTISTE) Project – Based in CEOSpaceTech, UPB, Bucharest, Romania

- Developed AI pipelines for TB-scale data compression for future ESA missions in collaboration with DLR and Airbus.

Visiting Researcher – Oct 2021 to Oct 2022
Zentrum für Sensorsysteme (ZESS), University of Siegen, Siegen, Germany

- Designed and built end-to-end complex-valued deep architectures and implemented for SAR data classification and compression.

PhD Research Assistant – Dec 2020 to Dec 2023
CEOSpaceTech, UNSTPB, Bucharest, Romania

- Developed AI systems for high-dimensional EO data, including semantic segmentation, classification, and neural data compression.

Engineer of Construction Department - 2012 to 2018
Caspian Mode (2017-2018) **/ Behsouzazar** (2012-2017) **Companies**, Tehran, Iran

Education

PhD of Electronics, Telecommunications and Information Technology - Dec 2020 to Dec 2023
National University of Science and Technology POLITEHNICA Bucharest (UPB), Romania

- Early-Stage Researcher in the frame of EU Marie Skłodowska-Curie ITN project MENELAOS-NT in the field of "Deep learning for SAR data in presence of adversarial samples"
- Research Center for Spatial Information (CEOSpaceTech), Faculty of Electronics, Telecommunications and Information Technology

Master of Science (MSc) of Remote Sensing Engineering – Sep 2016 to Sep 2018
K.N. Toosi University of Technology, Tehran, Iran

- Remote Sensing Research Center, Geomatics – Remote Sensing Engineering faculty
- Thesis Title: Bag of Visual words Model enhancement for PolSAR Images Classification

Bachelor of Science (BSc) of Geodesy and Geomatics – Sep 2012 to Sep 2016
K.N. Toosi University of Technology, Tehran, Iran

- Faculty of Geodesy and Geomatics Engineering

Research Projects and Grants

- **Adaptive SAR Signal Compression Through Artificial Intelligence (ARTISTE)**, European Space Agency (ESA/ESTEC) project (Contract Nr. ESA AO/1- 11419/22/NL/GLC/my), Role: AI specialist and proposal writing, Project goal: Provide AI-based solutions for SAR raw data compression for future ESA missions in collaboration with DLR and Airbus teams, 2022-2023.
- **MENELAOS-NT – Multimodal Environmental Exploration Systems - Novel Technologies,** European Training Network (ETN) H2020-MSCA-ITN project (Grant No. 860370), Role: Early-Stage Researcher (ESR 15), Project goal: Application of Novel Technologies for multimodal – multi sensor data fusion, delivered by different sensors, scales, resolutions and reliability, 2019-2024.
- Participation in the proposal preparation for multiple ESA Invitation to Tender (ITT).

Fellowships, Awards, and Certificates

- **MSCA Doctoral Scholarship** from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 860370, MENELAOS-NT Project (2020-2023)
- Ranked in the highest 1% of the participants for the national university entrance exam of B.Sc. and M.Sc. degrees and got awarded the **national B.Sc. ad M.Sc. university fellowships** at K.N. Toosi University of Technology (2012 and 2016)
- Certificate of the **IEEE GRSS High-Performance and Disruptive Computing in Remote Sensing (HDCRS) 2023** summer school
- **Reviewer** of several peer-revied journal and conference articles, including IEEE TGRS, J-STARS, GRSL, IGARSS, etc.

Selected Publications (420+ citations on Google Scholar)

Selected Working Papers

- **R. M. Asiyabi,** et al. " Towards Scientific AI: Domain-Aware Deep Learning with Interpretable Intermediate Features for Biomass Mapping from Earth Observation Data".
- **R. M. Asiyabi,** et al. "Generative AI for Earth Observation, a Prospect".

Selected Published Datasets

- **R. M. Asiyabi,** et al., April 8, 2023, "S1SLC_CVDL: A Complex-Valued Annotated Single Look Complex Sentinel-1 SAR dataset for Complex-Valued Deep Networks", IEEE DataPort, doi: https://dx.doi.org/10.21227/nm4g-yd98.

Selected Journal and Conference Papers

- **R. M. Asiyabi**, et al., "Complex-Valued Autoencoder-Based Neural Data Compression for SAR Raw Data," IEEE J-STSP - Journal of Selected Topics in Signal Processing, vol. 19, no. 3, pp. 572-582, (2025).
- **R. M. Asiyabi,** et al., "Complex-Valued End-to-End Deep Network with Coherency Preservation for Complex-Valued SAR Data Reconstruction and Classification," IEEE TGRS - Transactions on Geoscience and Remote Sensing, vol. 61, pp. 1-17, (2023), Art no. 5206417.
- **R. M. Asiyabi,** et al., "Complex-Valued Autoencoders with Coherence Preservation for SAR," *EUSAR 2022; 14th European Conference on Synthetic Aperture Radar*, Leipzig, Germany, pp. 1-6, (2022).

Selected Presentations:

- Presentation at the AI sessions at the ESA Living Planet Symposium 2022 & 2025, ESA Phi-lab 2021, IEEE IGARSS 2021 & 2022 & 2023 & 2024, EUSAR 2022 & 2024, CBMI 2023, and many more.