

ANITA MADANI

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SKILLS

Coding

- Python (50k+ lines)
- C (10k)
- C++ (10k)
- Bash (5k)
- Java (5k)
- MATLAB (3k)
- Verilog (1k)

Expertise

- Computer Vision
- 3D Reconstruction
- Visual Localization
- Change Detection
- Remote Sensing
- Deep Learning
- Diffusion/Generative Models
- LLMs
- Multi-Modal Learning
- Algorithms & DS
- Optimization
- Linear Algebra
- Probability
- Signal & Image Processing

Tools

- PyTorch
- TensorFlow
- Keras
- scikit-learn
- Hugging Face
- ONNX
- OpenCV
- COLMAP
- torchvision
- TensorBoard
- MLflow
- Git
- Docker
- SLURM
- Conda/Mamba
- CMake
- Linux
- AWS
- SQL

PROFESSIONAL EXPERIENCE

Research Assistant

Johns Hopkins University, AIEM & VIU

📅 2024 – Present 📍 Baltimore, MD

- Algorithms for **image registration**, **visual localization**, and **3D reconstruction**, improving correspondence estimation under challenging real-world conditions.
- Remote sensing and change detection** with multimodal data, addressing temporal shifts, seasonal variations, and structural change using modern representation learning approaches.
- Broad research expertise spanning **model architecture design**, efficient adaptation methods, and advanced feature representations for large-scale scene understanding.
- Experience with **diffusion models**, **generative modeling**, and **large language models (LLMs)** for vision and multimodal applications.
- Collaborating with multiple universities on the WRIVA project, preparing models for real-world deployment in operational settings.

Intern

Asr E Gooyesh Pardaz

📅 Summer 2022

- Built a 50k-utterance Persian speech dataset; trained DL models (TensorFlow/PyTorch) for gender/age attributes, reduced error rate by 32%.

HONORS & AWARDS

- Graduate Fellowship** — Whiting School of Engineering, Johns Hopkins University
- Qualified for national Math and Informatics Olympiad** (2016)
- Valedictorian** — Farzanegan 1 School (NODET, Middle & High School)

EDUCATION

Ph.D., Electrical & Computer Engineering

Johns Hopkins University

📅 2023 – 05/2027 (expected) 📍 United States

MSE, Electrical & Computer Engineering

Johns Hopkins University

📅 2023 - 2025 📍 United States

GPA: 3.92

PUBLICATIONS & SUBMISSIONS

- Madani, S. et al.** *DiffRegCD: Integrated Scene Alignment and Change Detection Using Diffusion Features*. WACV 2026.
- Madani, S. et al.** *Morphing Through Time: Diffusion-Based Bridging of Temporal Gaps for Robust Alignment in Change Detection*. WACV 2026.

SELECTED PROJECTS & RESEARCH

WRIVA

Johns Hopkins University / IARPA

📅 2024 – Present

- Research on **image registration**, **visual localization**, and contributions to **3D reconstruction** for large-scale, real-world datasets.
- Developed algorithms robust to viewpoint shifts, doppelgänger scenes, and diverse camera models using multi-modal data (ground, UAV, satellite).
- Built scalable workflows with **Airflow**, **AWS**, and **Docker**, enabling automated evaluation, multi-institution benchmarking, and deployment.

Search Engine Optimization via Semantic Graphs

📅 2021 – 2022

- Built a Persian semantic graph with **2M+ documents**, applying GNNs (GCN, GAT) for improved text representations.
- Boosted retrieval with spectral clustering and PageRank, cutting query latency by **23%** and raising MRR by **17%**.

Financial Deep Learning with Swarm Learning

📅 2021

- Implemented **swarm learning** for decentralized regression on financial time-series (LSTM, TCN).
- Achieved a **7% RMSE reduction** while preserving data privacy across institutions.