

Javad Sheikh ML Engineer | CV, Remote Sensing

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SUMMARY

Machine learning engineer with experience building end-to-end computer vision systems for mobile and remote sensing applications. My background includes developing CNN-based segmentation and fusion models for satellite data, optimizing models for edge deployment using TensorFlow Lite, and contributing to production-ready Android SDKs. I have practical experience with Docker, Python-based ML pipelines, and collaborative development in applied research settings. Currently expanding my focus toward model deployment workflows and MLOps tools for scalable machine learning in real-world environments.

EMPLOYMENT HISTORY

- 2022 – Now 📌 **Doctoral Researcher**, Department of Computing, University of Turku, Turku, Finland.
- **Developed** full computer vision pipelines for real-world remote sensing tasks, including segmentation and prediction models for sea ice and mineral deposits using multi-source satellite data (SAR + AMSR2).
 - **Proposed** SEDA, a similarity-enhanced data augmentation method for addressing highly imbalanced datasets.
 - **Co-authored** 7 peer-reviewed publications on sea ice segmentation, vessel prediction, mineral prospectivity, and ML methods for geospatial data.
- 2018 – 2019 📌 **Mobile Application Developer**, Sibbank, Tehran, Iran.
- **Built and deployed** an OCR SDK for Android used by the Agriculture Bank of Iran; integrated real-time credit card scanning into mobile banking apps.
 - **Trained and optimized** CNN models for mobile inference using TensorFlow Lite, focusing on reducing model size and latency for low-end Android devices.
 - **Collaborated** with cross-functional teams to ensure robustness and reliability of the scanning experience across devices and lighting conditions.

EDUCATION

- 2023 – Now 📌 **D.Sc. in Information and Communication Technology**, University of Turku, Turku, Finland.
Thesis title: *Advanced semantic segmentation of remote sensing data for Maritime and Mining applications*
- 2018 – 2021 📌 **M.Sc. in Artificial Intelligence and robotics** Amirkabir University of Technology, Tehran, Iran.
Thesis title: *Anomaly detection on time series using deep neural networks.*
- 2013 – 2018 📌 **B.Sc. in Biomedical Engineering** Amirkabir University of Technology, Tehran, Iran.
Thesis title: *Design and Implementation of mobile room lighting control equipment for patients with paraplegic patients.*

TECHNICAL SKILLS

- 📌 **Programming:** Python, C++, Java, SQL
- 📌 **Deep Learning Frameworks:** PyTorch, TensorFlow
- 📌 **Computer Vision:** OpenCV, MobileNet, custom CNNs, Unet, DenseNet
- 📌 **Model Deployment:** TensorFlow Lite, Android SDKs, Docker

TECHNICAL SKILLS (CONTINUED)

- **Data Handling & Tooling:** Pandas, NumPy, Scikit-learn, Git, GitHub, Azure
- **Other:** VS Code, GitLab, basic LaTeX

SELECTED PUBLICATIONS

- 2025 ■ **Sheikh, J.**, Farahnakian, F., Farahnakian, F., Zelioli, L., Heikkonen, J., *SEDA: Similarity-enhanced data augmentation for imbalanced learning.*, In: Pattern Recognition, Springer, 2025. DOI: 10.1007/978-3-031-78395-1_3
- Proposed a novel augmentation method for improving robustness of visual classifiers under severe class imbalance.
- 2024 ■ Farahnakian, F., **Sheikh, J.**, Zelioli, L., Nidhi, D., Seppä, I., Ilo, R., Nevalainen, P., Heikkonen, J., *Addressing imbalanced data for machine learning based mineral prospectivity mapping.*, Ore Geology Reviews, 2024. DOI: 10.1016/j.oregeorev.2024.106270
- Applied ML to low-sample, noisy geospatial datasets under extreme class imbalance; techniques transferable to constrained computer vision tasks.
- 2023 ■ **Sheikh, J.**, Farahnakian, F., Farahnakian, F., Heikkonen, J., *Ice-water segmentation using deep convolutional neural network-based fusion approach.*, In: 2023 28th International Conference on Automation and Computing (ICAC). DOI: 10.1109/ICAC57885.2023.10275247
- Trained CNN fusion models for multi-source segmentation under low resolution and low contrast conditions.
- **Sheikh, J.**, Farahnakian, F., Farahnakian, F., Heikkonen, J., *Sea Ice Concentration Estimation via Fusion of Sentinel-1 and AMSR2 Based on Encoder-Decoder Architecture.*, In: 2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC). DOI: 10.1109/ITSC57777.2023.10422541
- Built encoder-decoder models to estimate ice concentration using heterogeneous satellite imagery.
- Full publication list on my Google Scholar.

TEACHING EXPERIENCE

- Spring 2024 ■ **Teaching Assistant for Computer Vision and Sensor Fusion**, Department of Computing, University of Turku, Turku, Finland.
- Spring 2025 ■ **Teaching Assistant for Computer Vision and Sensor Fusion**, Department of Computing, University of Turku, Turku, Finland.
- Spring 2015 ■ **Matlab Teaching Assistant**, Department of Biomedical Engineering, Amirkabir University of Technology, Tehran, Iran.

PROJECTS

- 2021 ■ **Retinopathy Detection Android App**
Developed an Android app for detecting diabetic retinopathy by retraining a DenseNet model. Deployed using TensorFlow Lite for real-time inference on entry-level phones under variable lighting conditions.
- 2020 ■ **Automatic Weighing Lysimeter System**
Designed and assembled a sensor-based embedded system for soil moisture monitoring. Built the full hardware-software pipeline, including data acquisition, logging, and wireless transmission.
- **Brain Surgery Bipolar Electrocautery Simulator**
Co-developed a haptic surgical simulator with real-time force feedback. Modeled tool-tissue interactions and implemented embedded control for electrosurgical training.

REFERENCES

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