Mohammadmahdi Koochali

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AI Engineer and Computer Vision specialist with hands-on experience in deep learning, generative AI, and biomedical image analysis. Skilled in building scalable pipelines in cloud environments (AWS, GCP), turning complex data into real-world solutions — from segmentation and tracking to multimodal analysis and synthetic data generation. Experienced in collaborative software engineering, driven by curiosity, clear communication, and problem-solving.

Work Experience

German Research Center for Artificial Intelligence (DFKI) **September 2021 – Present**
Research Assistant *Saarbruecken, Germany*

- Applied deep learning models for live cell segmentation and tracking in microscopy images.
- Created and refined datasets for microscopy image analysis to improve model performance.
- Developed SAT model for cell segmentation and tracking, featuring BoxSAT with +15.96 MOTA improvement over current state-of-the-art on CTMC using single-box first-frame annotations, and PointSAT achieving 80%+ MOTA with first-frame point annotations for efficient, scalable analysis across diverse datasets and imaging modalities, significantly reducing annotation time and cost.

Sensifai **November 2019 – October 2020**
Data Scientist *Tehran, Iran*

- Developed, trained, and deployed deep learning models (such as YOLO series, EfficientDET, RetinaNet, and CenterNet) for Object Detection, Face Recognition, Fire Detection, and Violence Detection tasks

Education

Saarland University **March 2025**
M.Sc. Bioinformatics *Saarbruecken, Germany*

- **Thesis Title**: Segment and Track Anything for Microscopy (Grade: 1.0/1.0)
- **Area**: Applied Computer Vision (Image Segmentation: Segment Anything, SAM2, YOLO, and Object Tracking: ByteTrack, PIPS, CoTracker, DeepSort, TapNet), Generative Models

Kharazmi University **November 2020**
B.Sc. Computer Science *Tehran, Iran*

- **Thesis Title**: Representing UbiqLog Dataset in three different mediums (Music Generation, Narrative, Animation with Deep RL)
- **Area**: Creative AI, Multimodal Learning, Deep Reinforcement Learning, Representation Learning, Generative Models

Publications

- Box it, Track it: A Weakly Supervised Framework for Cell Tracking, *DAGM GCPR 2025*
- SAT: Segment and Track Anything for Microscopy, *ICCART 2025*
- CellGenie: An End-to-End Pipeline for Synthetic Cellular Data Generation and Segmentation: A Use Case for Cell Segmentation in Microscopic Images, *Conference on Medical Image Understanding and Analysis (MIUA 2024)*
- DeepMuCS: a framework for co-culture microscopic image analysis: from generation to segmentation, *IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI)*
- Point2mask: a weakly supervised approach for cell segmentation using point annotation, *MIUA 2022*

Skills & Interests

- **Technical Skills**:
  - **Programming & Frameworks:** C++, Python (including libraries like PyTorch, TensorFlow, Keras, Scikit-learn, Numpy, Pandas), SQL, Docker, Git, CI/CD
  - **Data Science & Machine Learning:** Object Detection, Object Tracking, Generative Models, Anomaly Detection, Deep Learning, Computer Vision, AB Testing, Large Language Models (LLMs), VLMs
  - **Data Visualization:** Matplotlib, Plotly, Seaborn
  - **Tools & Platforms:** AWS, Elasticsearch, Kubeflow, OData
  - **Mathematics & Statistics:** Statistical Modeling, Predictive Analytics, Probability Theory
- **Soft Skills**: Effective Communicator, Problem Solver & Creative Thinker, Fast Adopter, Leader & Team Player

Language Proficiency

- **English**: Full professional proficiency **German**: Limited working proficiency