

MARJAN STOIMCHEV

PhD in AI | Computer Vision & Machine Learning Research Engineer

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SUMMARY

PhD researcher with 7+ years of experience designing scalable deep learning models for remote sensing, medical imaging, and materials science. Expertise in Vision Transformers, Graph Neural Networks, and self-supervised learning. Proven record in multi-GPU PyTorch Lightning pipelines, research leadership, and cross-domain collaboration. Published in IEEE journals and presented at international conferences.

CORE SKILLS

Languages & Frameworks: Python, PyTorch, PyTorch Lightning, TensorFlow, Keras, PyTorch Geometric (PyG), NumPy, OpenCV, torchvision, Scikit-learn, XGBoost, Hugging Face Transformers, Fastai, AutoML, Matplotlib, Seaborn, MONAI, Optuna, MLflow, WandB, ONNX/TensorRT

Machine Learning & Computer Vision: Vision Transformers (ViTs), Diffusion Models, Self- and Semi-Supervised Learning, Representation Learning, Graph Neural Networks (GNNs), Multi-Label and Hierarchical Classification, Explainable AI (XAI)

Engineering & Tools: Docker, Git, MLOps, HPC/Slurm, LaTeX, Linux

WORK EXPERIENCE

PhD Research Scientist, Jozef Stefan Institute

Oct 2021 - Dec 2025

- Designed hierarchical and semi-supervised multi-label classification models for complex image domains.
- Developed graph-based ViT+GNN architectures to model taxonomic dependencies and improve structured prediction.
- Implemented reproducible multi-GPU pipelines using PyTorch Lightning and Hydra.
- Led and supervised MSc interns, ensuring reproducible ML pipelines across remote sensing, medical, and material science projects.
- Published research findings in IEEE journals (TGRS 2024, JSTARS 2025).

Computer Vision Engineer (Part-time), MedAI

Nov 2024 - Present

- Developed self-supervised models (DINOv2/DINOv3, MAE) for multiplex immunofluorescence imaging to support clinical phenotyping workflows.
- Built embedding pipelines for spatial clustering and neighborhood analysis for cell-type discovery.
- Contributed to model integration and deployment in clinical decision-support prototypes.
- Improved cell-type identification accuracy and reduced manual annotation time by ~20 %

SELECTED PROJECTS

Representative research and engineering projects across remote sensing, biomedical imaging, and materials science domains.

Remote Sensing and Environmental AI

- Built semi- and self-supervised ViT models (SSL-MAE, DINOv2) for multi-label land-cover classification.
- Improved mean F1 by 12% on benchmark datasets while reducing labeled data by ~40%.

Microscopy and Materials Science

- Created a vision-based autoencoder framework for drift correction in Scanning Transmission Electron Microscopy (STEM), reducing spatial distortion by 70 % and automating alignment.
- Implemented a zero-shot segmentation pipeline for nanomagnetic particle analysis using the Segment Anything Model (SAM).

Biomedical and Pathology Imaging

- Developed DINOv2/DINOv3/MAE embedding pipeline for whole-slide analysis enabling cell-type clustering and survival analysis, with optimized multi-GPU training and mixed-precision inference for efficiency.
- Implemented SAM-based zero-shot segmentation for nuclei, cutting annotation costs by 90%.

Biometric and Natural Image Analysis

- Developed deep convolutional models for Contactless Palmprint Recognition with local feature embeddings, resulting in a peer-reviewed Sensors publication (2021).
- Trained CNNs for Leaf Recognition and Cassava Leaf Disease Classification, demonstrating robust generalization across diverse image datasets.

SELECTED PUBLICATIONS

Stoimchev, M., Levatic, J., Kocev D. and Dzeroski, S. "SSL-MAE: Adaptive Semisupervised Learning Framework for Multilabel Classification of Remote Sensing Images Using Masked Autoencoders," in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 18, pp. 14882-14896, 2025, doi: 10.1109/JSTARS.2025.3578196

Stoimchev, M., Levatic, J., Kocev D. and Dzeroski, S. "Semi-Supervised Multi-Label Classification of Land Use/Land Cover in Remote Sensing Images With Predictive Clustering Trees and Ensembles," in *IEEE Transactions on Geoscience and Remote Sensing*, vol. 62, pp. 1-16, 2024, Art no. 4706416, doi: 10.1109/TGRS.2024.3426981.

Stoimchev, M., Ivanovska, M., Shtruc, V. Learning to Combine Local and Global Image Information for Contactless Palmprint Recognition. *Sensors* 2022, 22, 73. <https://doi.org/10.3390/s22010073>

EDUCATION

PhD, Information & Communication Technologies, Jozef Stefan Institute **Oct 2021 - Dec 2025**
Research focus: Semi-supervised and hierarchical multi-label learning for remote sensing and biomedical imaging.

MSc, Electrical Engineering, University of Ljubljana **Sep 2018 - Jan 2021**
Recipient of Prešern Award for best independent research work during the master's program.

BSc, Electrical Engineering, Ss. Cyril & Methodius University, Skopje **Sep 2013 - May 2018**
Coursework: Control theory, robotics, signal processing, AI systems.

ADDITIONAL INFORMATION

- **Languages:** English (C2), Macedonian (native), Slovenian (C1), Serbian (C1), German (A1), French (A1)
- **Hobbies:** Basketball, Swimming, Hiking, Painting, Diving, Cycling