



**Vilnius
University**

Artificial Intelligence Methods Lab (AIML)

Artificial Intelligence Methods Lab (AIML) — Vilnius University

- **AIML:** A method-centric AI research lab focused on trustworthy, reproducible AI methods aligned with Europe’s ethical and regulatory direction.
- **Purpose:** build “trust-by-design” AI methods (not just applications) that are robust, transparent, and evaluation-driven.
- **Research pillars:** Explainable AI (XAI), Multimodal AI (e.g., vision–speech), and Agent-based / agentic AI methods.
- **What we do:** research + PhD/postdoc training, integration into university studies, and ecosystem building through EU projects, workshops/summer schools, and national-level outreach.

High-Performance Computing (HPC)

- VU MIF HPC infrastructure
- 0.5 PFLOPS, 50+ TB RAM, 32-GPU partition
- Enables large-scale training, evaluation, and data-intensive EO/ML research



AIML Team

Core researchers

- Valentas Gruzauskas
- Linas Petkevičius

Research Team

- Artiom Hovhannisyan
- Augustė Raišytė
- Boleslovas Dapkūnas
- Evgenij Shapovalov
- Jonas Matuzas

- Justinas Lekavičius
- Kursat Kömürcü
- Linas Bevainis
- Marius Šomka
- Povilas Kvedaras
- Saulė Satkauskienė
- Vytautas Paura
- Vytautas Valaitis
- Vytenis Šliogeris

Projects

➤ **New-Generation Multi-Objective Satellite Image Recognition Algorithms for Climate Monitoring**

LMT, 2023–2026

Rapid detection of environmental change (floods, droughts, surface-water dynamics) from multi-sensor satellite imagery for near-real-time alerts.

➤ **AI-Driven Multimodal Remote Sensing Analysis**

LMT, 2025–2027

Unified AI pipeline that fuses EO imagery and in-situ data, orchestrated by an agentic LLM for automated, explainable environmental assessments at scale.

➤ **Real-Time Mapping of Peat Hydration Using Data Fusion and Deep Learning**

ESA RPA, 2025–2026

SAR–optical fusion to map peatland moisture in (near) real time, reducing fire risk and CO₂ emissions.

➤ **UrbanClimate**

ESA Malta, 2024–2026

Integrated EO and urban sensor data with our super-resolution enhancement to produce neighborhood-scale heat maps and prioritize cooling interventions (greening, cool roofs, shading).

Publications

- Kömürcü, Kürşat, and Linas Petkevičius. "MiniCPM-V LLaMA Model for Image Recognition: A Case Study on Satellite Datasets." *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (2025).
- Komurcu, K., & Petkevicius, L. (2025). Multispectral Image Caption Unification Using Diffusion and Cycle GAN Models. *IEEE Access*, 13, 193708-193718.
- Kömürcü, K., & Petkevičius, L. (2024). Change detection in satellite imagery using transformer models and machine learning techniques: a comprehensive captioning dataset. In *DAMSS: 15th conference on data analysis methods for software systems*, Druskininkai, Lithuania, November 28-30, 2024. (pp. 56-57). Vilniaus universiteto leidykla.
- Grendaitė, D., & Petkevičius, L. (2024). Identification of algal blooms in lakes in the baltic states using sentinel-2 data and artificial neural networks. *IEEE Access*, 12, 27973-27988.
- Lekavičius, J., & Gružasuskas, V. (2024). Data Augmentation with Generative Adversarial Network for Solar Panel Segmentation from Remote Sensing Images. *Energies*, 17(13), 3204.
- Other

Collaboration & Opportunities

- **R&D projects (fundamental + applied):**

trustworthy, reproducible AI methods → real-world impact

- **EU consortia:**

seeking partners for Horizon Europe and other international calls

- **Startups & industry:**

open to co-development, pilots, and tech transfer (incl. joint IP)

- **Talent:**

recruiting PhD candidates, postdocs, research engineers, and visiting researchers



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