

Gergely Dinya

Research Engineer | Computer Vision and Machine Learning

dinyagergely@gmail.com | github.com/gergelydinya | gergelydinya.com | linkedin.com/in/gergely-dinya/

Professional Summary

Research engineer with Python and C++ experience building end-to-end systems for multi-camera tracking, semantic SLAM and video instance segmentation, with published research papers, open-source software and a released game. Primarily interested in computer vision and robotics.

Technical Skills

Methods: multi-camera synchronisation, camera pose estimation, multi-object tracking, 3D reconstruction, semantic SLAM, video instance segmentation

Programming: Python, C, C++

Computer vision and machine learning: PyTorch, OpenCV, Open3D, NumPy, object detection and segmentation models (YOLO, SAM, SAM2)

Computer graphics and GUI: OpenGL, GLSL, Tkinter, Qt, Streamlit

Others: Git, Linux, LaTeX

Familiar with: ROS

Languages: English (CEFR C2), Hungarian (native)

Work Experience

Technical Research Assistant (Internship) | Max Planck Institute for Biological Intelligence

Küpper Group | Oct 2026 – Nov 2026

- Working on automated trail camera image processing using deep learning for camera soiling and camouflaged animal detection.

Technical Research Assistant (Internship) | Max Planck Institute for Biological Intelligence

Küpper Group | Aug 2025 – Sep 2025

- Developed a set of tools for tracking ruffs (a wading bird) and analysing their behaviour in an indoor aviary, used across the group's research projects, including Spezie et al., *Royal Society Open Science* (2026).
- Developed SAMannot, an open-source SAM2-based video annotation tool that helps reduce user interaction during annotation. Published in *Journal of Open Research Software* (2026).

Technical Research Assistant (Internship) | Max Planck Institute for Biological Intelligence

Rattenborg Group | Mar 2024 – Aug 2024

- Developed an automated multi-camera, multi-animal synchronisation and instance-tracking system for swimming birds in a complex floating aviary environment. Results published in *Ecological Informatics* (2025)

Selected Projects

SceneVGGT | 3D Semantic SLAM | Python. An online end-to-end semantic SLAM system built on a VGGT backbone for indoor scene understanding and assistive navigation, combining 3D reconstruction, semantic mapping and temporally coherent scene representation. Codebase and accompanying paper published.

SAMannot | Video Instance Segmentation | Python. An interactive video annotation tool, utilising Meta's SAM2 to enable efficient segmentation workflows with minimal user interactions. Codebase and accompanying paper published.

Wyred | Game Development | C++. A 2D puzzle game released on Steam, built using the custom Titan framework.

Titan Framework | Game Development | C++. A lightweight game development framework with OpenGL-based rendering. Code available on GitHub.

Education

MSc in Computer Science | Artificial Intelligence Specialisation

Eötvös Loránd University, Faculty of Informatics | Sep 2024 – Feb 2026

Weighted average: 4.96/5 (5 = best); final examination: 4.5/5

BSc in Computer Science

Eötvös Loránd University, Faculty of Informatics | Sep 2021 – Jul 2024

Weighted average: 4.88/5 (5 = best); final examination: 5/5

Selected Publications

- Anna Gelencsér-Horváth*, **Gergely Dinya***, Dorka Boglárka Erős, Péter Halász, Islam Muhammad Muqsit, Kristóf Karacs. *SceneVGGT: VGGT-based online 3D semantic SLAM for indoor scene understanding and navigation*. Accepted for Oral Presentation at ICIP 2026. arXiv:2602.15899.

- **Gergely Dinya**, András Gelencsér, Krisztina Kupán, Clemens Küpper, Kristóf Karacs, Anna Gelencsér-Horváth. *SAMannot: A Memory-Efficient, Local, Open-source Framework for Interactive Video Instance Segmentation based on SAM2*. Journal of Open Research Software, 2026. doi.org/10.5334/jors.680.
- **Gergely Dinya***, Anna Gelencsér-Horváth*, Andrea Ferretti, Niels C. Rattenborg, András Lőrincz. *Multi-Camera Synchronization and Instance Tracking for Avian Behavior Analysis in a Floating Aviary*. Ecological Informatics, 2025. doi.org/10.1016/j.ecoinf.2025.103419.
- **Gergely Dinya**, Péter Halász, András Lőrincz, Kristóf Karacs, Anna Gelencsér-Horváth. *Building temporally coherent 3D maps with VGGT for memory-efficient Semantic SLAM*. Preprint, 2025. arXiv:2511.16282.
- **Gergely Dinya** and Anna Gelencsér-Horváth. *Automatic camera orientation estimation for a partially calibrated camera above a plane with a line at known planar distance*. Preprint, 2025. arXiv:2507.20689.
- Giovanni Spezie, **Gergely Dinya**, Anna Gelencsér-Horváth, Wolfgang Goymann, Leonida Fusani, Clemens Küpper. *Distinct space use patterns are associated with alternative reproductive tactics in the ruff Calidris pugnax*, Accepted to Royal Society Open Science, 2026.

*Equal-contribution first authors.

Grants and Awards

- **Research Grant | EKÖP-25-2-I-ELTE-987 | 2025**. Semantically segmented digital twin generation for indoor environments, with target object localisation from smartphone data streams for near-real-time applications.
- **National Student Research Conference (XXXV. OTDK) | 2025**. Second place, Informatics Section.
- **Scientific Students' Association Conference | ELTE, Faculty of Informatics**. Informatics Section: first place and Shapr3D Best Talk Award (2025); second place (2024); first place and Bolyai János Award (2023).