SYNTHETIC DATA GENERATION FOR ROBOTICS AND AI SYSTEMS

This competency delivers modular, simulation-based synthetic and real-world dataset generation for robotics and AI research. It enables rapid model development and validation by reducing time-consuming data acquisition through digital twins, task simulation, and automated annotation. The activity supports applied RDI by providing high-fidelity, integration-ready datasets for industrial, agricultural, and medical robotics applications.

ACHIEVEMENTS

- Development of BAT (Blender Annotation Tool) and Label Factory for automated image generation and labelling.
- Creation of a task-simulation and trajectory-generation framework using ISAC SIM.
- Enablement of AI development workflows across agriculture, medical imaging, and industrial inspection.
- Design of lightweight, open-source-compatible pipelines accessible to startups, labs, and corporates.

INFRASTRUCTURE

- BAT for Blender-based synthetic dataset generation.
- Label Factory for automated real-world annotation.
- ISAC SIM-based frameworks for robotic task and motion simulation.
- Integration with ROS2, ISAC SIM, and Blender.
- Local servers and workstations for rendering, post-processing, and dataset versioning.

REFERENCES

- Crop-scenario simulations for AI vision tasks with a local medium-sized mushroom-growing company.
- Defect-detection research support for industrial inspection with a medium-sized poultry processing company.

Initium Venture Labs Zrt.
Email: initium@uni-obuda.hu
Web: www.initium.uni-obuda.hu
www.linkedin.com/company/initium-venture-labs
Tel: +36302128861