ADVANCED SIMULATION AND CONTROL OF DYNAMICAL ROBOTIC SYSTEMS

This competency focuses on the modelling, simulation, and control of complex robotic and mechanical systems using physics-based, multi-body dynamics. It supports precise, safe, and optimised motion control across industrial, medical, and field robotics. Virtual testing and model-based design reduce prototyping cost and improve functional safety prior to real-world deployment, directly strengthening applied RDI.

ACHIEVEMENTS

- Establishment of a new, high-fidelity simulation and control capability for complex robotic systems.
- Ongoing development of model-based control pipelines for precision robotics and automation.
- Integration of simulation-driven validation into interdisciplinary robotics research.

INFRASTRUCTURE

- Multi-body dynamics simulation platforms.
- High-performance computing for real-time model evaluation.
- Hardware-in-the-loop interfaces for control validation.
- Robotic arm and mobile platform testbeds.
- Motion capture, force sensing, and actuation integration.

REFERENCES

- MedLaBotX project (2024-1.2.3-HU-RIZONT-00069) in collaboration with National University of Singapore and Stanford University.

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