ARTIFICIAL INTELLIGENCE

PNRR - Enabling complex computer vision tasks on the edge

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Context of the research activity	Investigation of the use of large pre-trained models as a source of knowledge for enabling a truly embodied intelligence on edge devices. Progetto finanziato nell'ambito del PNRR. PNRR M4C2, Investimento 1.3 - Avviso n. 341 del 15/03/2022 - PE0000013 Future Artificial Intelligence Research (FAIR) - CUP E13C22001800001
Objectives	This research aims to investigate the use of large pre-trained models as a source of knowledge for enabling truly embodied intelligence on edge devices. The candidate will work both on large-scale models and tiny architectures and will be asked to develop novel deep neural architectures and optimization techniques to enhance the energetic and computational requirements of existing solutions. Particular relevance will be given to complex computer vision and multi-modal tasks, such as semantic, instance, and panoptic segmentation, and to task and motion planning for robotics.
Skills and competencies for the development of the activity	Candidate must possess a combination of technical skills, knowledge, and research capabilities: - Extensive knowledge of C++, Python, and Pytorch framework, with proof of experience in previous projects (e.g. through Git Hub). - English fluency. - Experience in preparing and revising research plans, understanding and disseminating research works, and writing scientific papers. - Experience with training and fine-tuning of large-scale uni- and multi-modal models, with specific reference to the Segment Anything Model and the CLIP model. - Experience with optimization of neural architectures for edge deployment, specifically for Nvidia Jetson series, Penguin Edge IFC6640 SBC, and Intel

	Movidius. - Experience with OpenMP for message passing in distributed environments. - Experience with the ROS environment, and capability to develop ROS applications for task and motion planning in anthropomorphic manipulators.