CONSORTIUM

MANiBOT gathers the multidisciplinary expertise of key players in the research and development of robotic technologies from seven countries.

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University of BRISTOL

MANiBOT

MANiBOT facts

Starting date: 1st November 2023
Duration: 42 months
Coordinator: The Centre for Research and Technology Hellas (CERTH)
Consortium: 13 partners from 7 European countries

FOR MORE INFORMATION

This project has received funding from the European Union's Horizon Europe programme under Grant Agreement No 101120823.

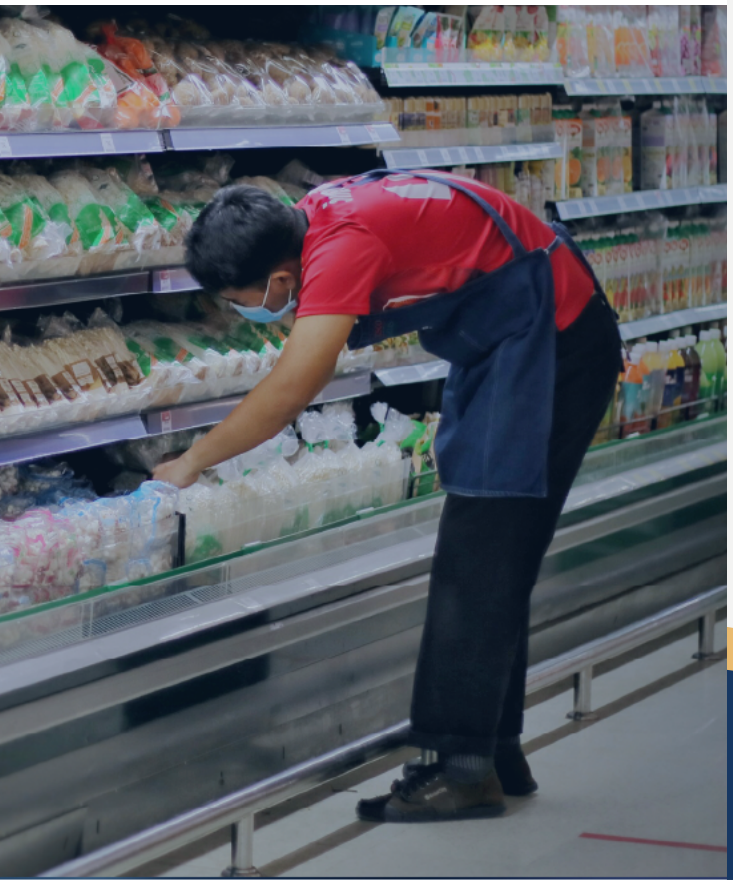
MANiBOT

Advancing the physical intelligence and performance of roBOTs towards human-like bi-manual objects MANipulation

SUMMARY

Pioneering Bimanual Mobile Robots for Challenging Work Environments

MANiBOT aims to empower bi-manual, mobile, service robots with enhanced manipulation capabilities enabling them to handle a wide variety of diverse objects, in a human-like manner and in diverse challenging environments. Project outcomes will be tested across four use cases in retail and transportation sectors, addressing tasks like shelves restocking in supermarkets and baggage handling in airports.



OBJECTIVES

- New environment understanding and object/pose recognition methods, empowered through a fusion of vision, proximity and tactile sensing. This will allow fast and effective manipulation, even of unknown objects, in environments with a human presence.
- A novel suite of manipulation primitives including non-prehensile manipulations. This will allow the transfer of diverse objects from a mobile robot, even within significant spatial constraints.
- Innovative cognitive mechatronics, fusing advanced tactile and proximity sensors with the bi-manual mobile manipulator. Energy efficiency and autonomy will be optimized, including HRI capabilities for trustworthy and efficient operation.
- A new approach for robot cognitive functions, based on multi-level robot cycles that allow learning, composing and swiftly adapting robot behaviours. This will enable complex manipulations to achieve complex goals.

WHY MANIBOT?

Despite advances in robotic perception, understanding and control, collaborative service robots still demonstrate limited physical performance compared to that of humans. This is particularly the case when it comes to safe and efficient robot-environment interaction with diverse object manipulation in human-populated spaces.

Industrial-grade robots demonstrate a high physical performance with fast, dexterous and robust object handling, resembling that of humans or beyond, but only in the context of handling well-known, modelled objects, in controlled environments.

Empowering service robots with advanced physical functionalities, capabilities, and efficiency that allows them to achieve a wide variety of manipulation tasks in real-world environments, in a bi- manual, human-like manner, remains an open challenge and needs major advances on a series of interdisciplinary research topics.

Once achieved, these advances will boost these robots' usage and their impact in new, major sectors of industry and services, from logistics, transport and retail, to agri-food, healthcare, and manufacturing; unlocking their true potential.