Université Grenoble Alpes

Cross Disciplinary Project (CDP) - 2022

Project Acronym	BOOT
Project Title	roBOts for real wOrld interacTion
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Executive summary

(max. 1 page, Calibri 11pt, single-spaced)

Thanks to recent technological advances, robots are increasingly present in our daily lives (automotive industry, service robotics, medical robotics and industrial robotics) and share their environments and tasks with humans. Robotics is considered as an imminent technological and societal revolution: the "France 2030" investment plan has announced an amount of 800 million Euros on robotics.

The current societal and economic challenge, strongly linked to the ethical balance of this new human-robot ecosystem, is to open the real world to robots in a harmonious synergy. It is a very visible and immediate challenge in all fields of robotics: industrial robotics, service robotics, medical robotics and social robotics. It is clear that no robot currently designed can yet satisfactorily meet this challenge, due to the complex, changing and ill-defined nature of the interaction taking place in the applications.

In this project, we adopt a resolutely multidisciplinary approach to robotics based on Grenoble's robotics communities in MSTIC and SSH in a strategy that departs from the current vision of robotics and its limitations. With the opportunity of this common framework of cooperation federating Grenoble's strengths, robotics will benefit from the integrative emergence of the competences of each of the actors, each of whom is highly recognized in their specialty. Thus, a cooperative and visible Grenoble community will be built by federating Grenoble's robotic skills in the engineering sciences of automation, mechatronics, signal processing, image processing, and computer science, and in the human and social sciences of cognition, social psychology, work psychology, neurobiology, automatic language processing, and ergonomics.

The CDP BOOT is structured in 4 axes: construction of complex robots (axis 1), perception (axis 2), decision and control (axis 3) and synergy of natural and robotic systems (axis 4, transversal). Moreover, the project will carry out important experiments and will rely on the numerous robotic platforms of the UGA.

Within the framework of this CDP, the results will be (i) methodological, with the formulation of guidelines for the design and development of robots interacting with the real world, but also (ii) technological, with important developments of our robotic platforms and associated digital technologies, and finally (iii) theoretical, with multidisciplinary synergies. Indeed, new models and paradigms for robotics in physical and social interaction with its environment will be invented in connection with the humanities and social sciences. This CDP will also advance the understanding of humans in their ecosystems, through the exploration and observation of robotic systems in their functions inspired by or demonstrating living human or animal systems.

This CDP has the ambition to position Grenoble as one of the major actors in robotics interacting with the real world, at the national and international level.