Description of Funded Research Projects
1st Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers

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Research Project Title:

Towards Socio-Cognitive Logic-based Agents

Principal Investigator:
Theodore Patkos

Popular Title:

Implementation of Artificial Intelligence methodologies for human-robot interaction and reasoning, taking advantage of visual and verbal stimuli

Scientific Field:
Mathematics and Information Sciences

Host Institution:
Foundation for Research and Technology, Hellas (FORTH) - Institute of Computer Science

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Research Project Summary

The field of robotics is lately experiencing a paradigm shift from heavy-duty robots operating in manufacturing, well-specified areas without tight collaboration with the human worker, to robots that operate close to humans, not only in industrial spaces, but all the more towards public environments, and even inside our homes. The recently emerged field of Social Robotics is attracting a lot of attention by both academia and industry, but also by experts beyond the world of robotics, who understand that this field will directly impact the quality of life of various categories of sensitive population, such as the elderly, people with physical or certain types of mild cognitive disabilities, and children, among others.

The research and societal challenges faced in this direction are of course many and admittedly expand beyond traditional robotics. From the AI research standpoint, the symbiosis of humans with robotic agents in less controlled environments introduces the need to design autonomous entities that can exhibit commonsense behavior, intuitive interaction through a plurality of communication means, planning of actions in partially observable and potentially unknown environments, and learning, in order to steadily obtain the experience to cope with unforeseen situations.

SoCoLA aims to develop a novel AI-enabled infrastructure for creating intelligent robotic agents, enhanced with cognitive and social skills, relying on formal and verifiable computational means. The development of social robotic agents capable of engaging in spoken interactions introduces new challenges not faced by traditional – non-robotic– dialogue systems. The innovative aspect of the SoCoLA project emerges from the combination of methodologies from mature research fields, appropriately adapted to the demands of the emerging Social Robotics domain. In particular, the consortium of the project brings together expertise from the fields of Computational Argumentation, Semantic Web, Logic-based common-sense inferencing, Machine Learning, and Inductive Programming (Learning).

Project Impact on Society

Research in the field of Social Robotics is expected to contribute primarily to the well-being of citizens belonging to various sensitive groups. Service robots, endowed with skills that constitute them fully operational near humans in the premises of their personal space, are going to have significantly broader capabilities and impact, supporting everyday human activities without requiring special conditions, such as training, special infrastructure etc. Despite the fact that attaining this goal is still many steps away, having to face many real challenges, an apparent prerequisite is the ability of the robot to communicate with humans in ways that are as intuitive and natural as possible, both in terms of interaction means and in terms of content being exchanged.

The SoCoLA project will investigate aspects of Artificial Intelligence that we believe can enhance autonomous robotic entities with social and cognitive skills.

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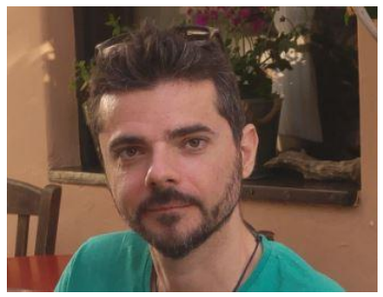
To me, H.F.R.I. funding would mean...



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A Computer Science postdoctoral researcher in Greece may currently be asked to carry out a wide variety of activities, from conducting basic and applied research in the context of national and European projects, to the preparation and coordination of research proposals, the coordination of ongoing projects, the (co)supervision of students of any degree, often even to the preparation of the necessary substrate for the exploitation of research results, e.g., through startups.
In this spectrum of duties, it becomes difficult to appropriately allocate resources in research that is tailored to his/her personal interests and which he/she considers prominent, not to mention putting together, financially supporting and coordinating a research team, under a common research agenda. The funding provided by H.F.R.I. in my case, is going to cover this need exactly. Through a well-balanced team of students and researchers, we aim to achieve progress in many ways, attracting the interest of new researchers along the way.

The Principal Investigator,

Theodore Patkos

Funding

Amount: **171,000 €**

Duration: **36 months**

Foundation: **H.F.R.I.**

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