

European Research Project SPENCER

EU Project, FP7-ICT-9-2.1, Nr. 600877

Project Start: Winter/Spring 2013

Title:

Social situation-aware perception and action for cognitive robots

Summary:

Motivated by the increasing number of robots that share a space with people in domestic or professional domains, SPENCER will break new ground for cognitive systems in populated environments. While there is an increasing focus on making robots more socially aware, related approaches are still limited in their capacity to perceive, model and learn human social behavior and respond with appropriate actions in real-time from mobile platforms. SPENCER will systematically address these problems and advance the fields of perception of individual humans and groups in sensory data, normative human behavior learning and modeling, socially-aware mapping, and socially-aware task, motion and interaction planning under real-world conditions. In particular, by addressing these problems simultaneously in a multi-disciplinary project team, we will exploit synergies which will enable us to design safer, more efficient, and more robust cognitive systems in human environments.

Demonstration Scenario and Applications:

The SPENCER consortium includes KLM, a large European airline as end-user that will deploy a robotic demonstrator for smart flow management of transfer passengers at the Amsterdam Schiphol Airport. The task of the robot will consist in picking up delayed transfer passengers from their arrival gate and bringing them to the priority lane of the Schenger barrier, thus addressing a flow problem for which every day passengers miss their flight. This deployment has a large exploitation potential beyond the lifetime of the project and is an excellent benchmark of the research developed in SPENCER. In addition to this, as the technology innovations developed in SPENCER are fundamental for all cognitive systems in human environments, they apply to general scenarios beyond the aviation industry. We will thus monitor also other potential application domains such as public spaces, train stations, shopping malls, urban areas, or hospitals.

What's special:

In order to deal with this challenging task in an user-friendly and efficient way, robots require new levels of understanding how they can merge into human environments and act in a conform way. To this end, we will develop learning techniques that allow robots to learn a variety of socially normative behaviors. Examples include etiquette rules in pedestrian traffic such as queuing behavior, avoiding groups as a whole, allowing people to overtake that need to rush, adapting driving and interaction behavior in the presence of elderly people and children, or engaging in interaction with groups through identification of likely spokespersons.

Freiburg's Part:

The Social Robotics Lab, Dept. of Computer Science, has initiated the project. Prof. Kai Arras is the coordinator.

Partners:

1. Albert-Ludwigs-Universitaet Freiburg, Germany (Coord.)
2. Technische Universitaet Muenchen, Germany
3. Universiteit Twente, The Netherlands
4. Oerebroe Universitet, Sweden
5. Centre National de la Recherche Scientifique CNRS, France
6. Rheinisch-Westfaelische Technische Hochschule Aachen, Germany
7. BlueBotics Inc., Switzerland
8. KLM Royal Dutch Airlines, The Netherlands

Picture (preliminary, showing the demonstration scenario):

