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Cognitive Services for Elderly People: The ROBADM project

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INTRODUCTION

The world's population is growing older, thereby introducing a wide array of challenges. It is estimated that in 2040 there will be three times more people over age 85 than they are today. Many are expected to need physical and cognitive assistance, due to physical and/or cognitive changes related to ageing.

Cognitive impairment is one of the major health problems facing elderly people in the new millennium. This does not only refer to dementia, but also to lesser degrees of cognitive deficit that are associated with a decreased quality of life and, in many cases, progress to dementia.

Growing ageing population has given rise to the development of device-based (helper-robots) home services. This market just starts to become structured in last past years from emergency assistance to healthcare and now from assistance to dependant people. As a result, various definitions have been proposed for this new field of robotics: service robotics, assistive robotics, social robotics and combination of them.

Service robots should operate semi- or fully autonomously to perform services useful to the well-being of humans. Assistive robots are designed for reducing the disability of patients and among them we can find intelligent wheelchairs, manipulation aids, walkers... Most of the assistive robots are dealing with physical disabilities. The design of social robots is clearly focused on the improvement of communication skills for various applications including entertainment, education and healthcare.

Regarding healthcare, Socially Assistive Robots is defined as the intersection of assistive robotics and

social robotics. The assistance is mainly provided by social interaction.

The ROBADM project is devoted to the design of a robot-based solution for assistive daily living aids: management of shopping lists, meetings, medicines. The specificity of our project is to develop a specific robot for providing verbal and non-verbal helps, encouragements and coaching during cognitive stimulation exercises.

The robot is dedicated to MCI patients (Mild Cognitive Impairment, i.e. the presence of cognitive impairment that is not severe enough to meet the criteria of dementia).

MOTIVATIONS TO PARTICIPATE AND IDEAS ON THE WORKSHOP TOPIC

The ROBADM project is dealing with various issues related to the workshop. More precisely, we are currently dealing with the following issues:

- The relationship between a robot and an elderly patient
- Ethical issues
- Designing emotional and emphatic robot
- Developing verbal and non-verbal communication tools taking into account the characteristics of elderly people
- Providing efficient and robust robotics based solutions

These issues are investigated with a multi-disciplinary approach allowing to produce and to evaluate relevant solutions.

WHAT THEY CAN CONTRIBUTE AND/OR WOULD LIKE TO LEARN OR 'TAKE HOME' FROM THE WORKSHOP,

The ROBADM consortium will give an overview on the current activities. We will focus on Human-Robot interaction part:

- Social context for designing social robots: feedback from focus groups
- First technological solutions for an expressive robot
- Verbal and non-verbal communication for elderly people

We also would like to learn more on on-going studies concerning the specificities of robots for elderly persons, and from empirical studies conducted in this area.

CONSORTIUM

The ROBADM project is composed by:

- Geriatric medical service (Broca Hospital, Paris) led Professor Anne Sophie Rigaud. This team is composed of psychologists, medical doctors (specialized in neurology and geriatrics) and social scientists.
- Valoria laboratory (Université Bretagne Sud, Vannes, France). This group is led by Professor Dominique Duhaut and is specialized

in the design of expressive robots for deficient users (children and elderly people)

- Artificial Perception and Handicap group (Université Pierre et Marie Curie, Paris) led by Mohamed Chetouani and it is dealing with signal processing, pattern recognition and social signals for interaction analysis. The group is composed by researchers on engineering science as well as researchers on social science (psychologists specialized in human centered interaction)
- Robosoft (Bidart, France) is SME specialized in the design of mobile robots and it has a special focus on assistive devices for elderly people.

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