

April 6-8, 2011 European Robotics forum

Dear colleagues

Here is a report on the workshop "Assistance robots for the elderly" that has been held during the European Robotics Forum in Vasteras, Sweden last week.

The organizers

Birgit Graf, Fraunhofer IPA, Germany
Jean-Pierre Merlet, INRIA, France
Claus Risager, DTI, Denmark

Workshop on Assistance robots for the elderly
European Robotics Forum 2011

The workshop was held during the last day of the European Robotics Forum and although this was the last workshop of the Forum it was quite well attended with about 40 participants. Ten presentations of 10 minutes, which are available at the workshop web site

[http://www.care-o-bot.de/english/euRobotics2011 WS Elderly.php](http://www.care-o-bot.de/english/euRobotics2011_WS_Elderly.php),

have been given with the objective of focusing on real interdisciplinary approaches while not focusing on the technical details:

1. Birgit Graf (Fraunhofer IPA) has presented the Care-O-bot assistance robot and several projects in which this robot has been involved. Real tests have been performed within the Wimi-Care project for offering water to elderly and possibly monitoring water consumption while the CASERO agv has been used to support care workers with transportation tasks. The robots have been well perceived both by the care takers and the elderly
2. Renxi Qiu (Cardiff University) has presented the SRS european project whose target is to propose semiautonomous robotic solutions in domestic environments to support elderly people. An extensive identification of the needs has been obtained by initially monitoring the activities of 17 elderly people and then by checking the validity of the identified needs on 63 patients
3. Filippo Cavallo (Scuola Superiore Sant'Anna, Pisa) has presented the ECHORD project ASTROMOBILE. A first result of this project is that although various sources for identifying the needs are available (literature review, experiments) it is still necessary to work close to end-users. The living lab DOMOCASA has been designed for such purpose and experiments for locating the end-user and the robot using RSSI signals has been performed while acceptance test will be performed
4. Jean-Pierre Merlet (INRIA) has presented the activities of his team in assistance. An experimental flat is used to test innovative devices such as walking aids, lifting crane for transfer, rehabilitation station with a focus on low cost communicating devices. The activities of this team is part of the larger scale initiative PAL that involves 10 INRIA teams
5. Anders Billeso Beck (DTI) has presented the CareLab facility, an open platform for testing assistance devices. Various systems such as the emotional PARO robot, a horizontal shower system and the telepresence robot GIRAFF are currently under test

6. Federico Pecora (Orebro University) has presented the SOFTEC (Swedish Open Facility for Technology in Elderly Care) platform. It has been observed that technology development occurs in cycles (technology, evaluation) that are coupled through prototypes and that a platform should be made available for these cycles. Then the centerpiece of SOFTEC, the Angen project has been presented: a deployment lab has been first built at Orebro University in the first round and in a second round 8 apartments will be instrumented with a RFID floor in a senior residence facility

7. Jos´ Vicente Marti (University Jaume I) has presented a person-following shopping cart assistance robot for carrying out daily goods. The end-user is wearing a collar with ultrasound and RF emitters and the robot uses TDoA to locate the end-user. The device has been tested with an elder man in a small grocery with a high degree of acceptance

8. Torsten Heyer (University of Bremen) has presented the FRIEND robot, a sophisticated automated wheelchair with a 7-dof arm, intelligent tray, stereo camera system and several input devices. Its developments has been based on a market survey of existing systems and user analysis. An interdisciplinary consortium mixing industry, IAT and end-users has been established. The system has been tested for preparation of a meal and service counter in a library. A purpose of FRIEND is to allow disabled person to return to professional life. Tests with possible end-users and therapists in a rehabilitation center in Bremen have shown a positive feedback

9. Christian Krauter (Frankfurt University of Applied Sciences) has presented the use of the PARO and PLEO robots with people suffering from dementia. These robots have been used in a retirement house and video record of human/robot interaction have been made. Analysis of these records have shown that emotional robots seem to promote social interaction and communication, to regulate emotions and to affect emotions in a positive way. Further research with the telepresence robot GIRAFF in nursing and care homes will be performed

10. Roger Bemelmans (Zuyd University) has presented the use of the PARO robot for Psychogeriatric care. A literature review has shown that PARO has potential, it is available with CE mark, but there is insufficient evidence of its benefits. For embedding PARO in a care context it is necessary to determine the target population, the How to (when, where, who, what), the added value (why) and an instruction protocol. Tests have been performed with 4 large organizations and 31 professionals. Two initial meetings has allowed to specify goals and procedures: unstructured interaction with PARO were performed, individual views on goals and result of group discussion were collected. During a final meeting there were group discussions to determine the type of outcomes and assessment tools. Three possible intervention were identified: Therapeutic purposes (psychological functioning, psychosocial well-being and social behavior), Facilitate daily care activities (focusing attention to reduce anxiety or stress), Support of social (family) visits (shared focus point) and it was observed the care givers are enthusiastic

In summary the presentations have shown that european laboratories are

very active in this field. The talks have shown that two main types of assistance are under investigation: assisting daily life activities (in residential care facilities, at home or at work) or emotional robots for therapeutic purposes. However the domain is certainly broader and work duplication should be avoided. This may be obtained by a reinforced collaboration, sharing resources (both for hardware and software), opening research facilities to other teams (especially as regulation laws regarding experimentation are quite different in the European countries). This is especially true as several european test beds are currently been developed (although their objectives may be different). It seems that there is a general agreement that assistance devices must also be smart objects being able to communicate with each other and with the environment. This raises several issues that time has not allowed to address such as safety, data confidentiality, network protocol and procedures, software certification to name a few.