



Robotic Assistant for MCI patients at home

H2020-PHC-2014-2015

RIA-643433








RAMCIP

Robotic assistant for MCI patients at home

- **RAMCIP:**
Robotic Assistant for MCI Patients at home
- Research and Innovation Action (RIA)
- Horizon 2020 – PHC-19-2014
 - Advancing active and healthy ageing with ICT: Service robotics within assisted living environments
 - Contract Nr: 643433
 - Start date: 1/1/2015
 - Duration: 3 years
- Consortium: 8 partners from 6 countries

The RAMCIP consortium



	Participant no.	Participant organisation name		Country
<i>Research centre</i>	1 (Coordinator)	Centre For Research and Technology Hellas (CERTH)		Greece
<i>University</i>	2	Technische Universitaet Muenchen (TUM)		Germany
<i>University</i>	3	Scuola Superiore Sant'Anna (SSSA)		Italy
<i>Research centre</i>	4	Foundation For Research and Technology Hellas (FORTH)		Greece
<i>SME</i>	5	ACCREA Engineering (ACCREA)		Poland
<i>University</i>	6	Medical University of Lublin (LUM)		Poland
<i>Non-profit organisation</i>	7	Barcelona Alzheimer Treatment and Research Center (ACE)		Spain
<i>SME</i>	8	Shadow Robot Company (SHADOW)		UK

Research and development of a novel home robotic assistant system for older adults with amnesic mild cognitive impairment (MCI) and at early stages of progressive dementia

- Recently, significant steps have been made in the context of service robotics for assisted living environments to support older people's independence (e.g. HOBBIT, ACCOMPANY FP7 projects), through robots capable to
 - autonomously move
 - providing entertainment and telepresence functions
 - learning and bringing objects
 - detecting falls or facilitating safe locomotion by removing small objects and obstacles from the person's path
- Major challenges still need to be addressed towards **service robots of the future**
 - capable of assisting older persons in a **wide variety** of activities
 - o discreetly and transparently, yet proactively and in tight cooperation with the human
 - acting as effective **promoters of the patient's mental health,**
 - **evolving** along with the user, capable to match her/his needs as they evolve over time

The RAMCIP vision

The RAMCIP vision is of future service robots capable of:

• Providing **safe, proactive and discreet assistance** in a series of significant aspects of the user's daily life

- From food preparation, eating and dressing activities to managing the home and keeping it safe
- the robot should also assist the user to maintain positive affect and also exercise cognitive and physical skills
 - o capacity **embedded in their daily behaviour**; i.e. providing such exercise subtly, by modifying the way they assist

ASSIST IN...	Food preparation	Eating activities	Dressing activities	Safe, Proactive and Discrete Assistance	
	Socialization	Lower-body treatment activities	Taking medication		
	Managing the home and keeping it safe	Maintaining positive affect	Exercising cognitive and physical skills		
HOW TO ASSIST	High-level cognitive functions				
	Home Environment and Human Activity Modelling and Monitoring	Human Robot Communication			Safe Manipulations Object Grasping/ Manipulation/Handover High object Reaching pHRI
		Multimodal	-Touch screen		
Adaptive		-Speech			
	Empathic	-Gestures	-AR		

The RAMCIP project aims to research and develop a novel service robot, capable to **proactively assist** older persons in a wide range of daily activities, being at the same time an **active promoter of the user's physical and mental health**

The RAMCIP robot will comprise three major innovative aspects:

- (a) **cognitive functions** based on **advanced user and home environment modelling** and monitoring, allowing the robot to decide **when** and **how** to assist the user,
- (b) novel adaptive **multimodal human robot communication interfaces**
 - with emphasis on **empathic communication and augmented reality displays**, all dynamically fused and tailored to the user and the environment needs,
- (c) **advanced, dextrous** and **safe** robotic manipulation capabilities
 - applied in service robots for assisted living environments
 - enabling **grasping and manipulation** of a wide variety of home objects, as well as safe physical HRI
 - introducing assistance activities that involve **physical contact**

- **Objective 1.** To develop a service robot that will be capable of robustly understanding **actions, complex activities** and **behaviour of multiple** persons in the user's home
- **Objective 2.** To develop a service robot that will provide **proactive, discreet** and **optimal** assistance to the user
- **Objective 3.** Establishment of advanced **communication channels** between the **user and the robot**
- **Objective 4.** Establishment of advanced **physical interaction** between the **robot and the home environment**
- **Objective 5.** Establishment of assistance activities involving **physical interaction** between the **robot and the user**
- **Objective 6.** To validate RAMCIP project results in real scenarios

- **Mobile base**

- Mobile platform with torque interface to the drives that will make compliant mobile manipulation possible. The mobile platform will be selected from the designs available at **ACCRA**.

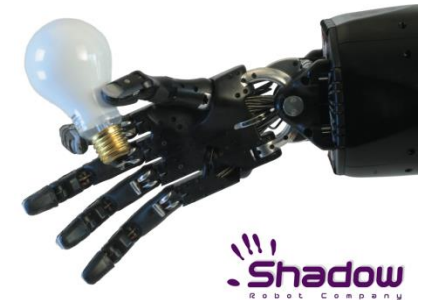


- **Robotic Arm**

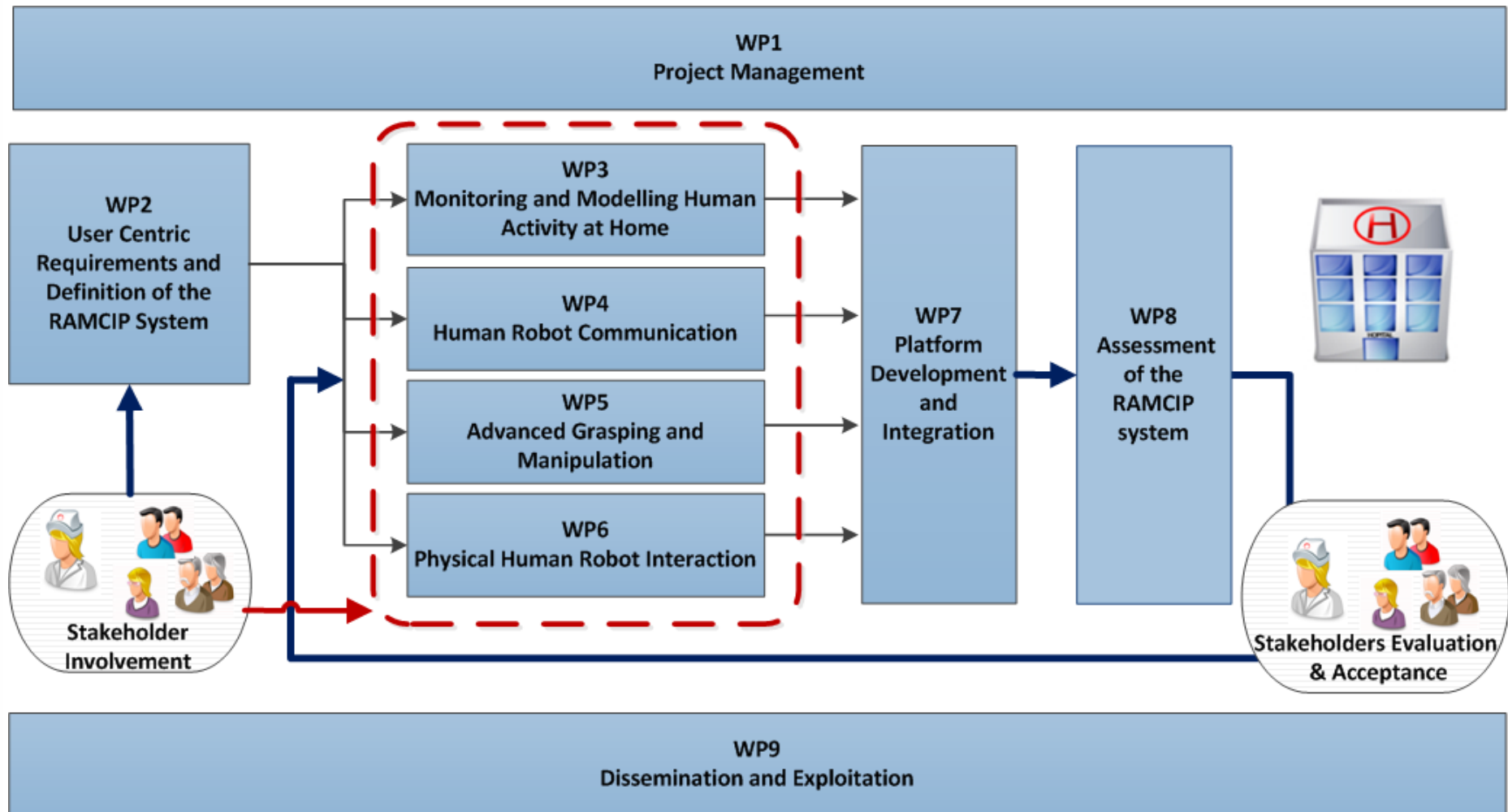
- **ACCRA** will build a robotic arm suitable for application in the household and pHRI for the planned tasks

- **Robotic Hand**

- **SHADOW** will research and develop an improved SHADOW hand that will be optimized for the application scenarios, developed with a roadmap to low cost for production, and will be integrated with the arm of the final RAMCIP robot



RAMCIP Workpackages Pert Diagram



- RAMCIP Website:

www.ramcip-project.eu

- Follow us on twitter:

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Thank you



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