



The European Coordination Hub for Open Robotics Development

E++ Review Meeting Period 3

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EUFO building, Luxembourg / February 14



Servicio Andaluz de Salud
CONSEJERÍA DE SALUD



universitat de tecnologia i treball
Institut Charles Delaunay



Universidad
Carlos III de Madrid



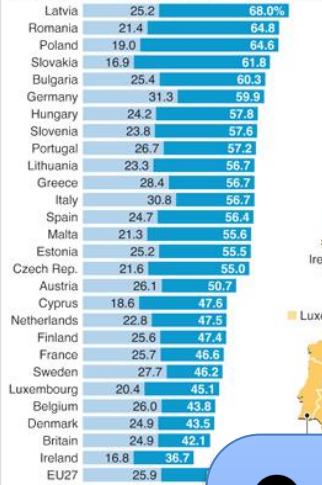
UNIVERSIDAD
DE MÁLAGA

Background / motivation

OLD-AGE DEPENDENCY RATIO

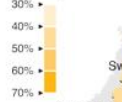
Projected number of persons aged 65 and over, expressed as a percentage of the projected number of persons aged between 15 and 64

BY COUNTRY — Ranked by 2060 data



BY GEOGRAPHY

Ranked by 2060 data



The profile of aging is changing dramatically

loss of independence
MUST NOT BE an
inevitable consequence
of aging



Comprehensive Geriatric Assessment (CGA)

- ✓ Individualized
- ✓ Periodic
- ✓ Patients and relatives

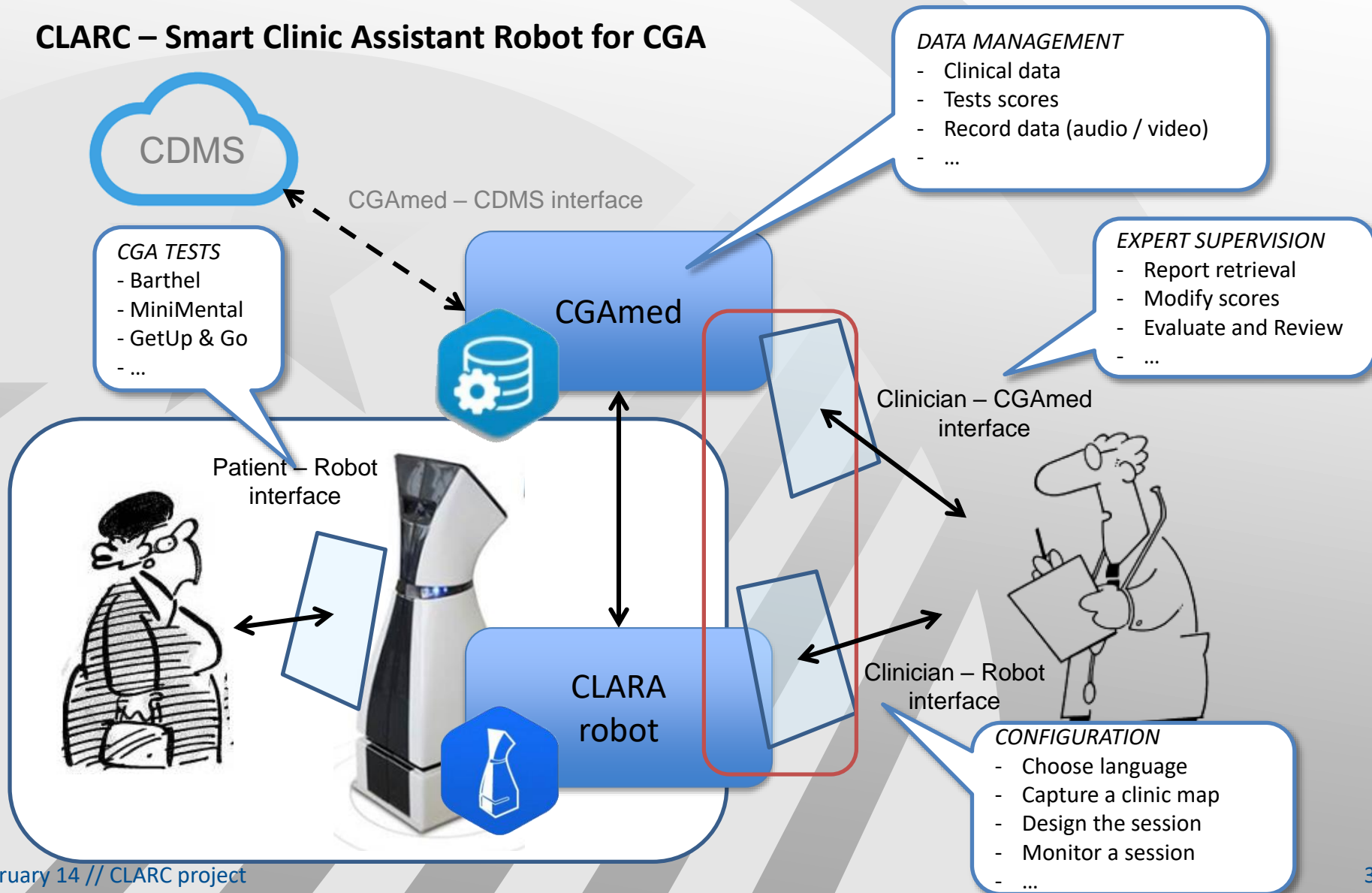
- ✓ Evidence-based interventions
- ✓ Individualized care plans



Healthcare services has problems for providing such as attention to an increasing population → why do not develop a tool for help them?

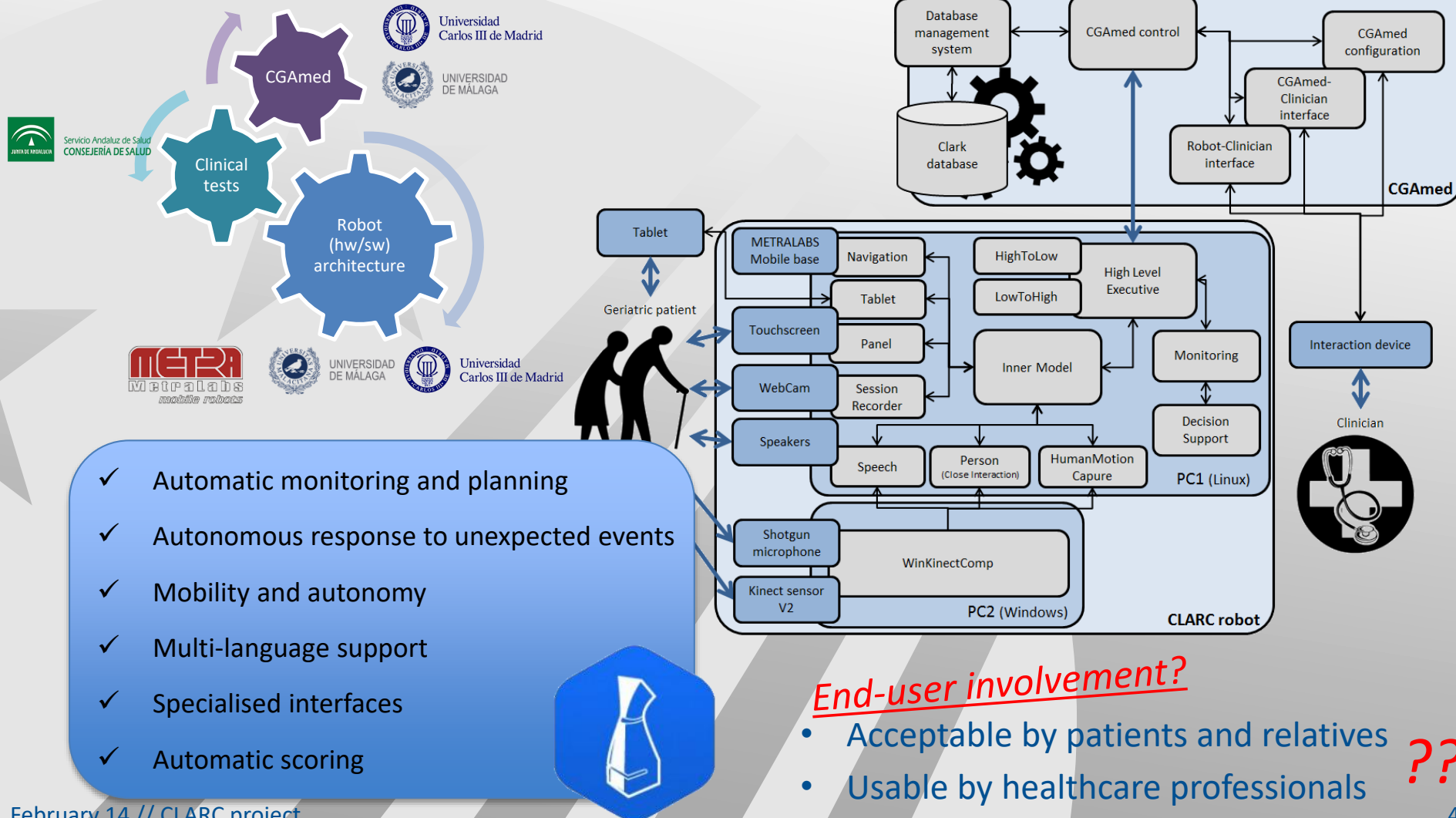
Technical progress

CLARC – Smart Clinic Assistant Robot for CGA



Technical progress

CLARC – Smart Clinic Assistant Robot for CGA



Technical progress

Participatory and user-centred Design Approach

❖ Users

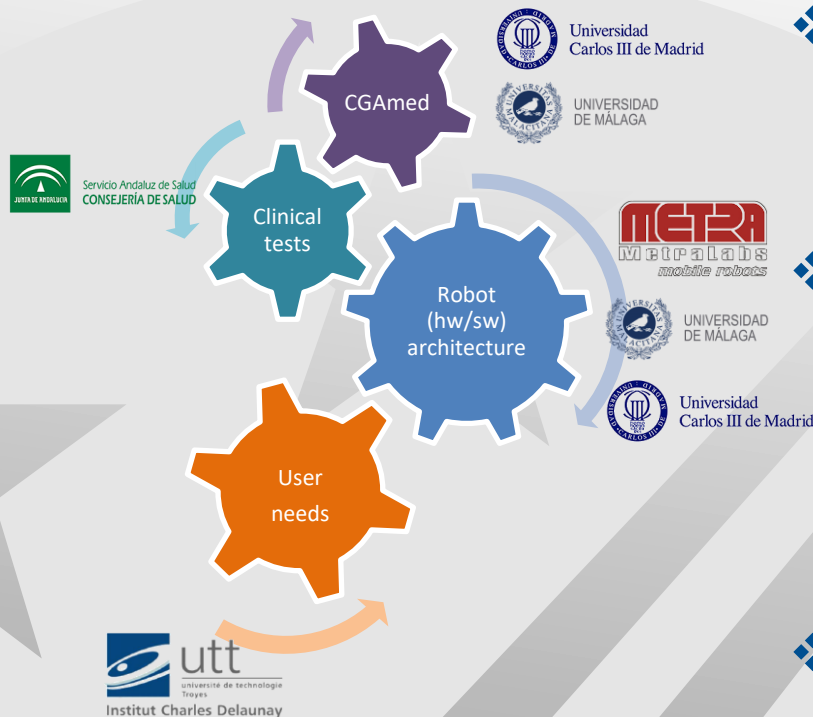
- Seniors (potential patients)
- Health professionals

❖ Beginning of Phase 2: User requirements analysis

- User tests (based on working prototype)
- Participatory workshops
- Interviews

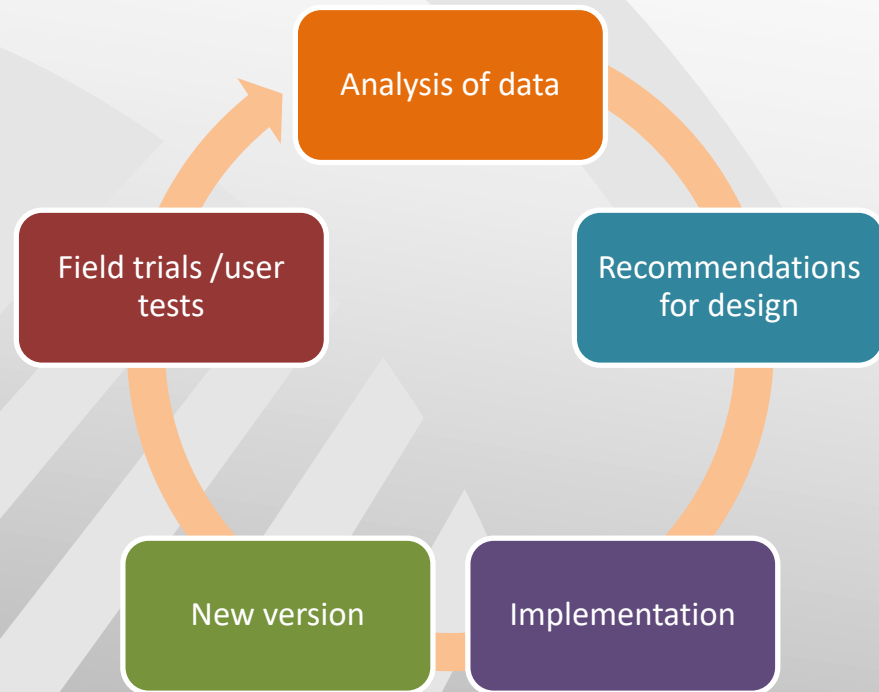
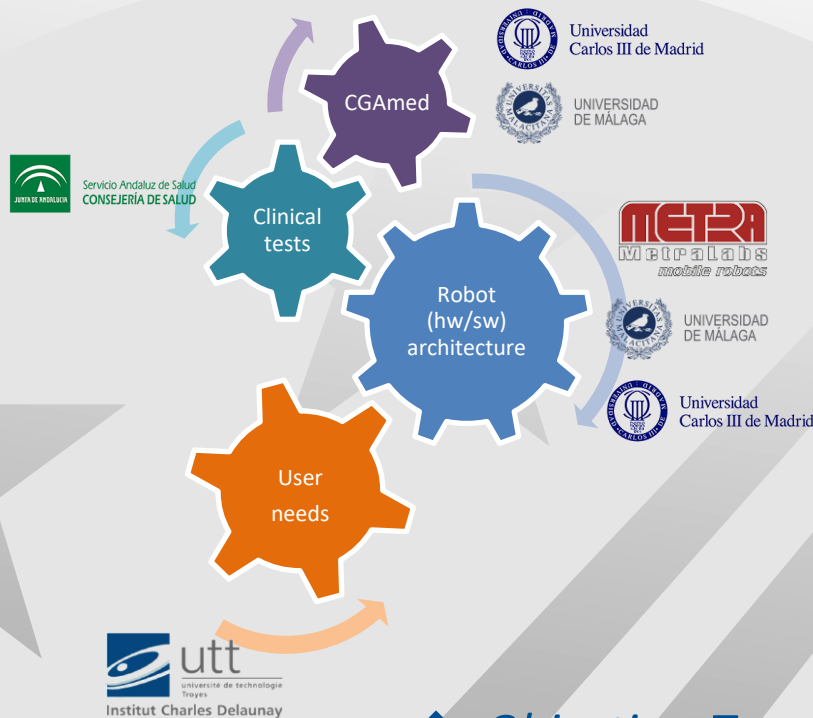
❖ January – Consortium meeting – Data

- 10 user tests – Barthel + Get Up & Go (French)
- 3 user tests – Minimental (English)
 - 13 post-test interviews
- 5 interviews of health professionals (geriatricians, physiotherapist, nurse, retirement home director)



Technical progress

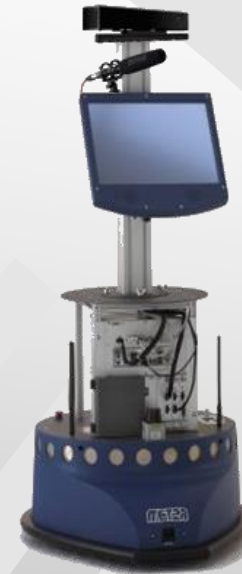
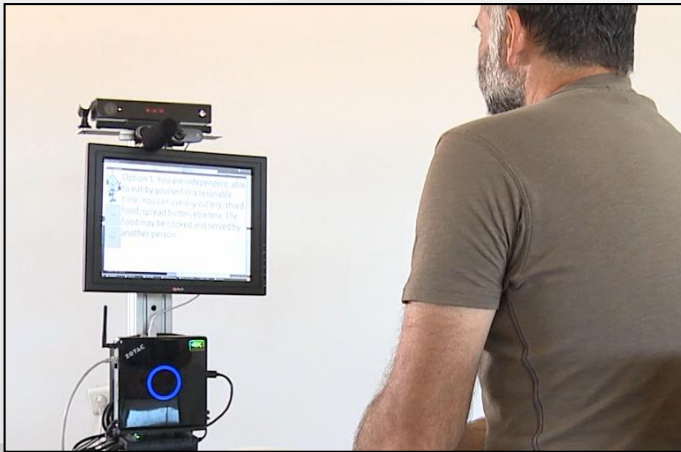
User analysis → Recommendations



- ❖ Objective: Translate to design ideas

- ✓ Users' needs
 - what patients value – interaction with doctor
 - health professionals' practices and habits
- ✓ Analysis of users' activity with the robot (difficulties in interacting)

Demonstrator/ prototype



Kinect sensor v2

Shotgun microphone

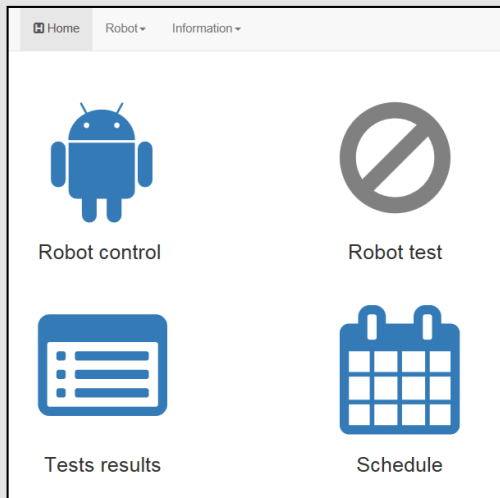
Touchscreen monitor

2 omnidirectional speakers

Barebone i7

Embedded PC with intel-i7 CPU
and Wi-Fi

SCITOS G5 mobile base



❖ First results: hypothesis of use case confirmed

➤ Acceptability of robot – seniors

- ✓ feel at ease doing the test
- ✓ easy interaction

➤ Usefulness for health professionals

- ✓ Geriatrician: greater efficiency in follow-up
- ✓ Nurse: more time for relational

Impact from participation in ECHORD++

XVII Workshop of Physical Agents Book of Proceedings

PROCEEDINGS OF THE WAP2016, JUNE 2016

CLARC: a Robotic Architecture for Comprehensive Geriatric Assessment

Antonio Bandera, Juan Pedro Bandera, Pablo Bustos, Luis V. Calderita, Álvaro Dueñas, Fernando Fernández, Ángel García-Olaya, Francisco Javier García-Polo, José Carlos González, Ana Iglesias, Luis J. García-Olaya, José Carlos Pulido, Christian Reuther, Adrián Romero-Garcés, Cristina Suárez

PROCEEDINGS OF THE WAP2016, JUNE 2016

Percepts symbols or Action symbols? Generalizing how all modules interact within a software architecture for cognitive robotics

R. Marfil, L.J. Manso, J.P. Bandera, A. Romero-Garcés, A. Bandera, P. Bustos, L.V. Calderita, J.C. González, A. García-Olaya, R. Fuentetaja and F. Fernández

Abstract—Robots require a close coupling of perception and action. Cognitive robots go beyond this to require a further coupling generally emphasised as a tightly integrated perception-action system, which is then loosely connected to some limited form of functional system such as a planner. At the other end, from the motor modules as independent functions. This paper proposes to allow both perspectives through a unique representation where the modules are grounded using the same set of symbols. This classic perceptuomotor and automated planning systems, being interact using the same tokens.

Index Terms—cognitive robotics, inner representations, symbol grounding

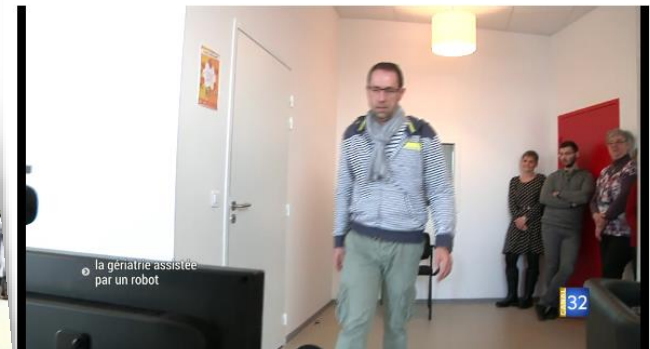
I. INTRODUCTION

ABSTRACT reasoning about phenomena from the outer world is intimately tied with the existence of an internal cognitive, this implies the establishment of a world could mean.

Figure 1 (left) shows a schematic view of RoboCog [4], [3], [11], a software architecture where this premise of maintaining a shared representation is held. The figure depicts how two different agents interact through this representation for unfolding agents, in charge of performing the necessary physical and perceptual actions, use this plan and the shared world model to perform their activities. In this case, the Person agent moves the robot. The Navigation agent takes these data and the use of the state of the world as the best mechanism to communicate software components was pointed out by Flynn and Brooks [6], as a way for reducing the large and close texture. Paradoxically, this was considered more a drawback than an advantage by Hartley [8], as it was a drawback.



LIVING LAB DE L'UTT : LA GÉRIATRIE ASSISTÉE PAR UN ROBOT



Diffusion le 20/01/2017

Un robot qui assisterait les soignants pour une meilleure prise en charge des patients âgés à l'hôpital, c'est l'objet d'une réflexion et d'un développement au Living Lab de l'UTT. Des tests sont déjà menés en France pour développer cette innovation technologique, et le robot est actuellement à l'UTT pour la recherche. Ce vendredi matin, il était notamment question d'un atelier participatif, une immersion pour 16 seniors.

Thank you.

Questions?