

MARIO: Managing active and healthy Aging with use of caRing servIce rObots

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Abstract

The MARIO project addresses the difficult challenges of loneliness, isolation and dementia in older persons through innovative and multi-faceted inventions delivered by service robots. Mario builds upon the Kompai R&D Robot. This platform features a telecamera, wifi, a series of sensors for indoor navigation and obstacle avoidance, speech recognition with natural voice interaction, daily life applications, a tablet PC, controller and interface technologies that support software easy plug and play development. The project aims to integrate in a single platform a series of capabilities (behavioral skills, gestures and emotion recognition) that represent the state of the art in robotics but that so far have been demonstrated in isolation.

Robot semantics based on Semantic Web practices and technologies: Linked Data principles, RDF, SPARQL, RIF. The Semantic Web used as background knowledge.

Semantic Web-based machine reading/listening in robots. FRED¹, will be extended and improved for dealing with context-based grounding and interpretation of natural language input. FRED is able to extract knowledge from text ("reads") and represents it into RDF graphs. It performs named entity recognition, entity typing, sense disambiguation, taxonomy induction, event recognition, semantic role labeling, relation generation, negation detection, modality recognition, tense identification.

"Entity-centric" knowledge management: each entity and its relations have a public identity that provides a first "grounding" to the knowledge used by robots. Such identity is given by resolvable URIs that use simple Web and Internet protocols to provide useful knowledge as a representative of real world entities.

Mario Ontology Network (MON) will reuse and extend the Ontologies for Robotics and Automation. MON will evolve over time by integrating ontologies emerging from interaction with assisted humans, sensors or with other robots.

Ability to advance robot knowledge by learning new ontology patterns from its experience with users and the robot network in place. New emerging patterns and expressions are fed back to the robot's cognitive system in order to address emotional needs of end users in compliance with the social and behavioral objectives of MARIO.

Robot social skills: a sentiment analysis framework based on deep parsing of natural language and supported by MON will deal with moods and expression recognition providing robots.



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Scan this to find out more about MARIO



1. FRED: <http://wit.istc.cnr.it/stlab-tools/fred>