CORTEX: a new Cognitive Architecture for Social Robots

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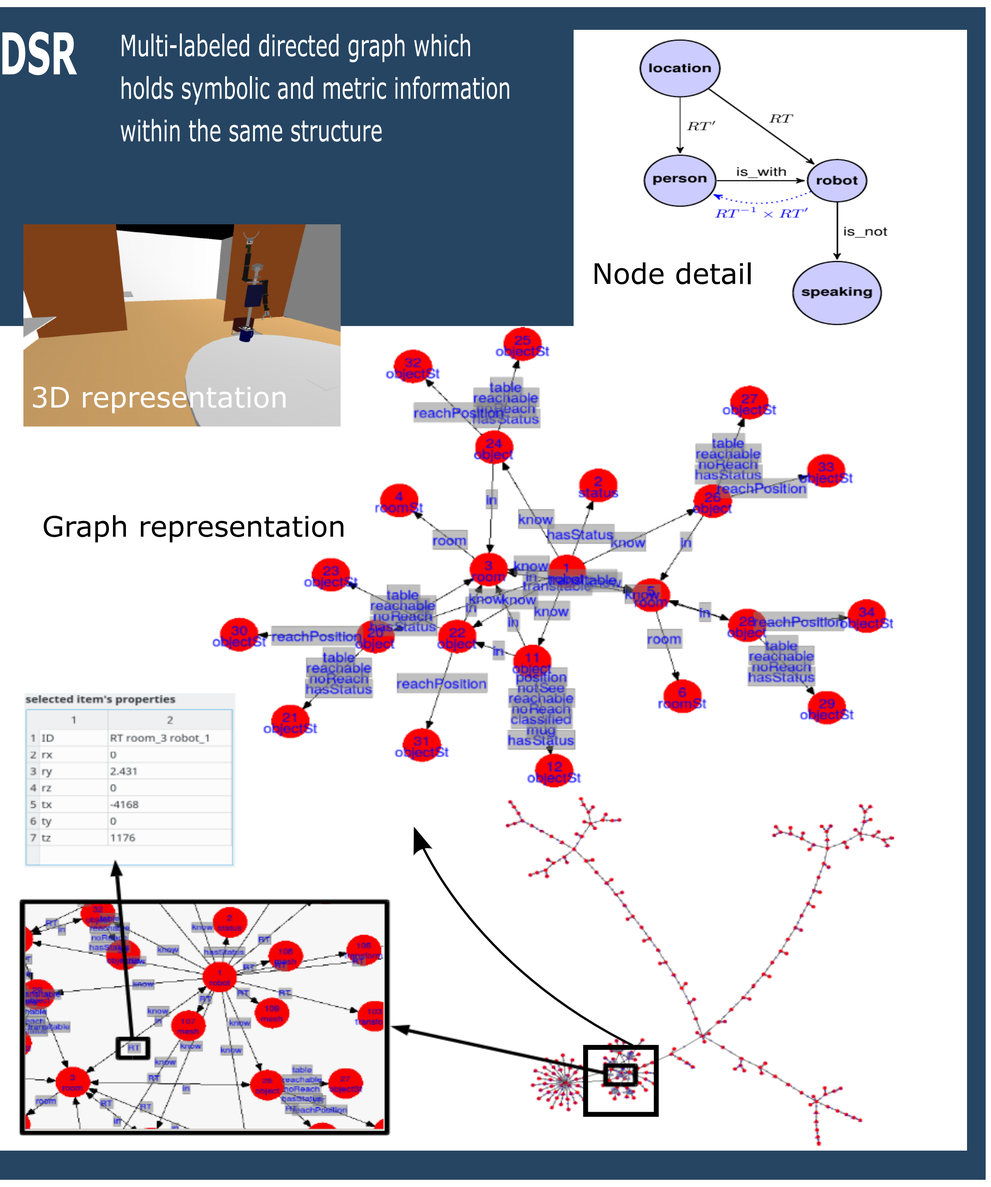
Motivation

The need of a Robotics Cognitive Architecture to:

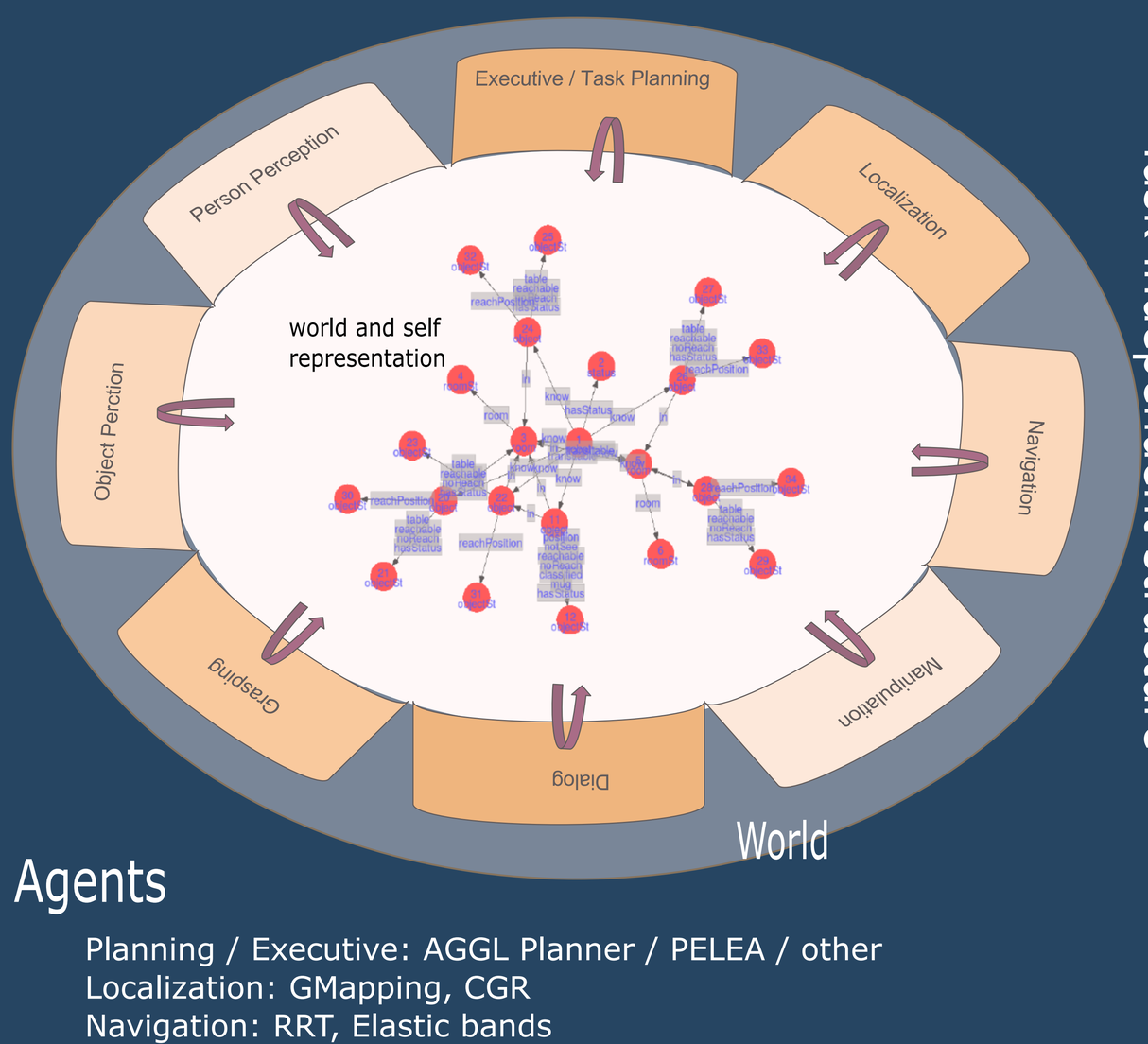
- to drive robots in real world scenarios
- to use a modular software approach
- to allow the inclusion of task-independent aspects
- to facilitate the integration oftask-dependant aspects

DSR

Multi-labeled directed graph which holds symbolic and metric information within the same structure



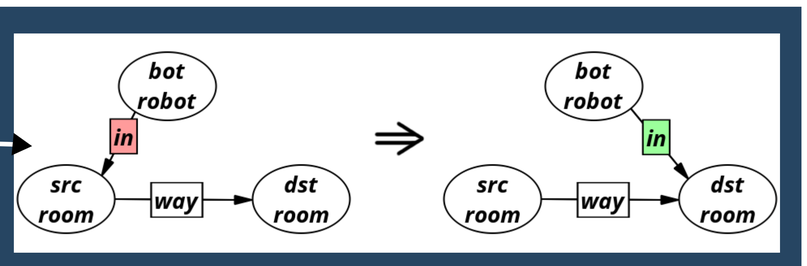
CORTEX



Agents

Planning / Executive: AGGL Planner / PELEA / other
Localization: GMapping, CGR
Navigation: RRT, Elastic bands
Manipulation: IK, discrete rep. of IK
Dialog: ASR, Senna
Grasping: forward simulation
Object perception: VFH, Conv. Networks, pose fitting
Person perception: Kinect SDK, dynamic descriptors

PLANNING RULES



changeRoom is used by the robot to move from a room to one of the adjacent ones.

graspObject describes the context in which a robot can grasp an object how the world model is affected thereby.

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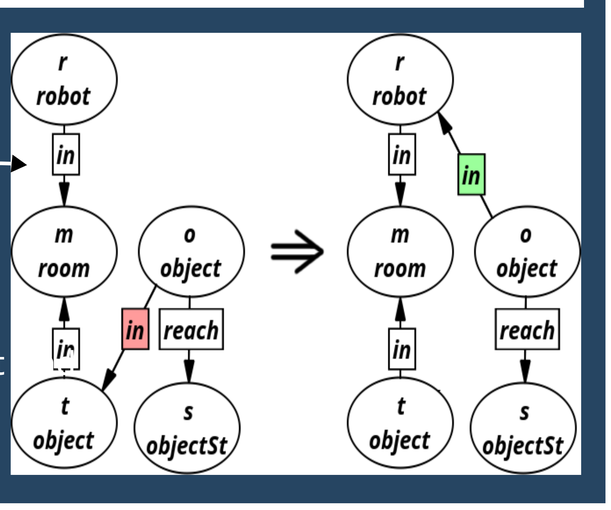
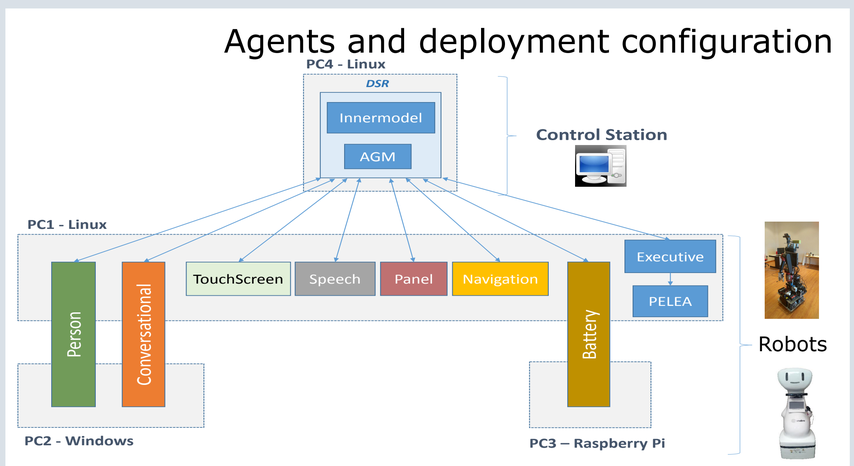


Use Cases



Shelly: social robot that assists people in daily activities

Gualzru: advertisement robot for social events

SHELLY

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[2] **A Perception-aware Architecture for Autonomous Robots.** L.J. Manso, P. Bustos, P. Bachiller, P. Núñez. International Journal of Advanced Robotic Systems (ISSN 1729-8806), InTech, Vol. 12, No. 174, 2015.

[3] **Use and advances in the Active Grammar-based Modeling architecture**. L.J. Manso, L.V. Calderita, P. Bustos, A. Bandera Workshop on Physical Agents WAF 2015, Málaga Spain.

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