

Tech United Eindhoven

RoboCup German Open 2015



AMIGO & SERGIO

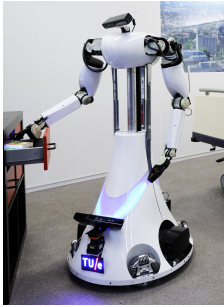


Figure 1: AMIGO

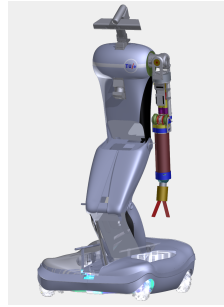


Figure 2: SERGIO

- AMIGO
 - Omni-wheels, 1 DoF torso
- SERGIO
 - Suspended mecanum wheels, 2 DoF torso
- 7-DoF manipulators
- Designs available at Robotic Open Platform

Perception

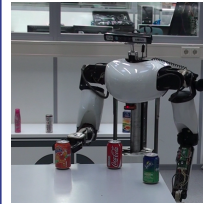


Figure 3: Pick up task

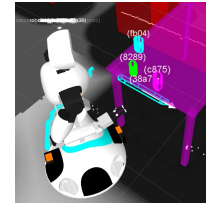


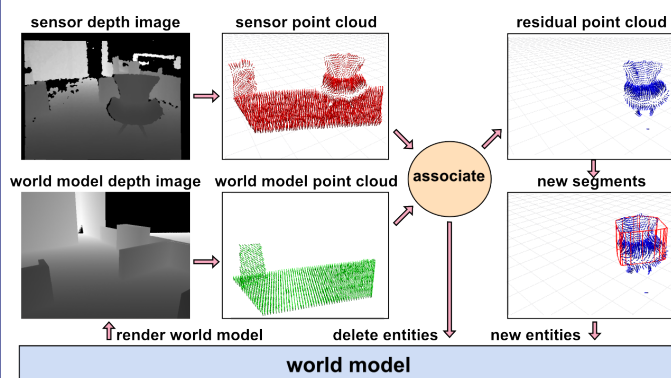
Figure 4: World model



Figure 5: Sensor view

- Combination of weak classifiers:
 - Size
 - SIFT
 - Color histogram
 - Contour
 - Face detection
- Asynchronous recognition and labeling of entities
 - Each entity has one threaded perception worker

World modeling



- A central object-oriented, volumetric world model, used for:
 - Navigation
 - Object tracking
 - Localization
- Objects have 3D shape, pose, type
- Updating by comparing rendered world model with depth image

Navigation

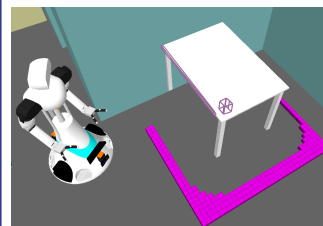


Figure 6: Exploration

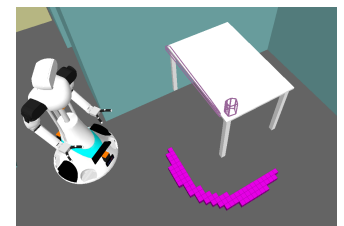


Figure 7: Manipulation

- Navigation map: downprojection of world model entities
- Goals are defined as regions
 - Goal region shape depends on task and shape of the world model entity
- Local planner: DWA with state behavior
 - Different behaviors when aligning with the trajectory or arriving at the goal