Tech United Eindhoven

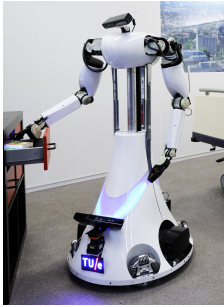## RoboCup 2015, Hefei, China

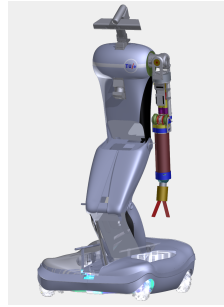## AMIGO & SERGIO

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

World modeling

Figure 3: Overview of ED: Environment Descriptor

- 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
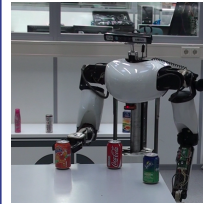
Perception

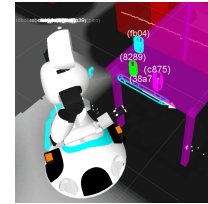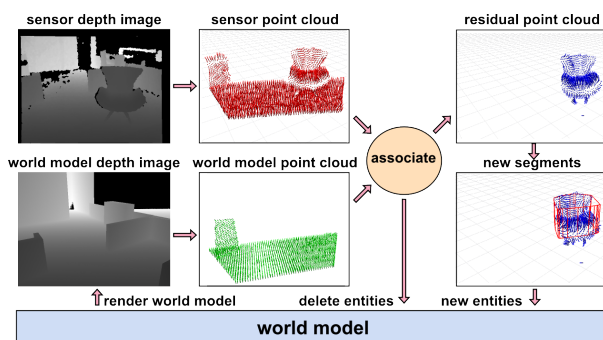Figure 4: Pick up task

Figure 5: World model

Figure 6: Sensor view

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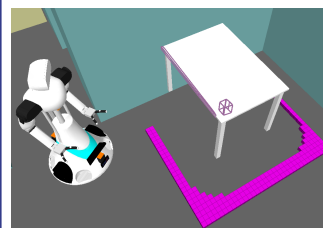 - Each entity has one threaded perception worker
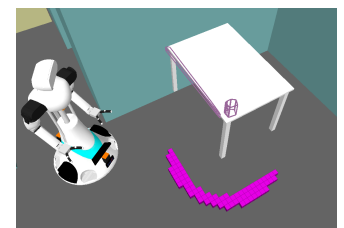
Navigation

Figure 7: Exploration

Figure 8: Manipulation

- Navigation map: top-down projection 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