RoboCup @Home

RoboCup 2017 Nagoya Japan
27 to 30 JULY COMPETITIONS
31 JULY SYMPOSIUM

TU/e Technische Universiteit Eindhoven University of Technology

Tech United Eindhoven

RoboCup Nagoya 2017

VANDERLANDE

SKM Rapid Modelling BV

AMIGO, SERGIO & HERO

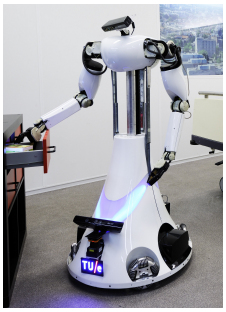


Figure 1: AMIGO

Figure 2: HERO

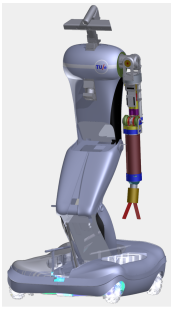
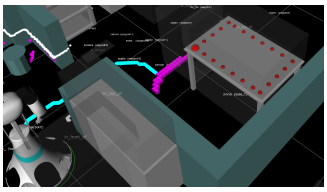
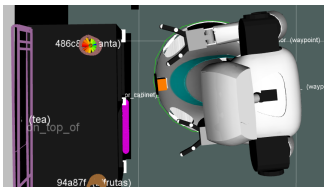


Figure 3: SERGIO

- AMIGO
  - Omni-wheels, 1 DoF torso
- SERGIO
  - Suspended mecanum wheels, 2 DoF torso
- 7-DoF manipulators

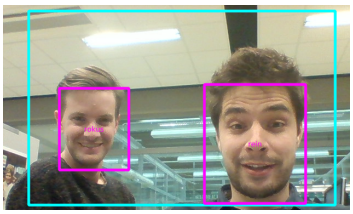
Improved manipulation





- Empty spot designator
  - Incorporates robot & object positions
- Grasping point determination

Image recognition



- Object recognition using Deep Learning
- Face recognition: Openface based on Torch
- Pose recognition: OpenPose
- ROS-packages: ros-kinetic-image-recognition

World modeling

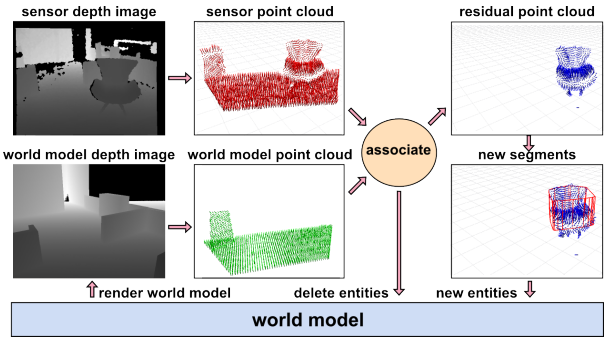
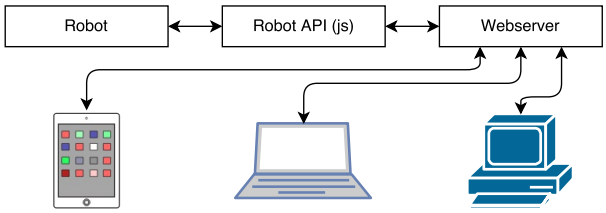


Figure 4: Overview of ED: Environment Descriptor

- A central object-oriented, volumetric world model, used for:
  - Navigation, localization
  - Object tracking
- Objects have 3D shape, pose, type
- Updating by comparing rendered world model with depth image
- Furniture fitting
  - Increases performance of navigation, localisation and object segmentation

WebGUI



- Web-based Graphical User Interface
- Cross-platform
- Action server schedules the robot's tasks based on user input

Natural language interpretation

- Natural Language Interpretation using Feature Context Free Grammar (FCFG)
- Speech recognition grammars are generated from FCFG