Tech United Eindhoven
RoboCup Montréal 2018

TECH UNITED EINDHOVEN

TU/e Technische Universiteit Eindhoven University of Technology · SIOUX · Cor Wit FONDS · reboocon bionics · maxon motor driven by precision · SANDERS MACHINEBOUW BV · TMC PEOPLE DRIVE TECHNOLOGY · BECKHOFF · VANDERLANDE

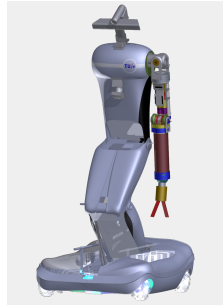## AMIGO & SERGIO

Figure 1: AMIGO

Figure 2: SERGIO

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

EtherCat RosControl

- New EtherCat implementation for RosControl
- Very generic driver interface
- Configuration of control framework from URDF
- Open-Source
- Work in Progress

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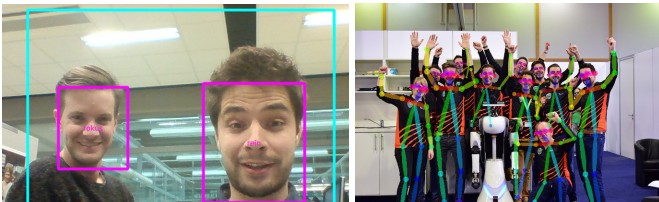
- Object recognition using Deep Learning
- Face recognition: Openface based on Torch
- Pose recognition: OpenPose
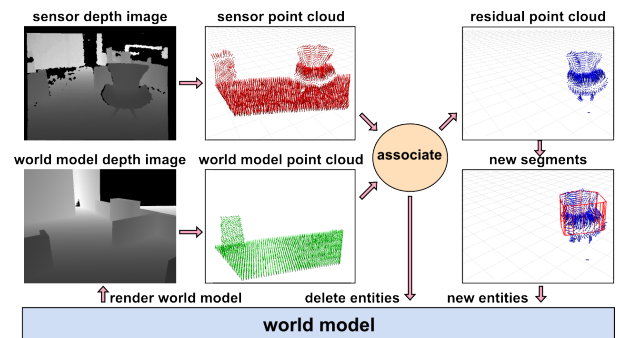- ROS-packages: ros-kinetic-image-recognition

World modeling

Figure 3: 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
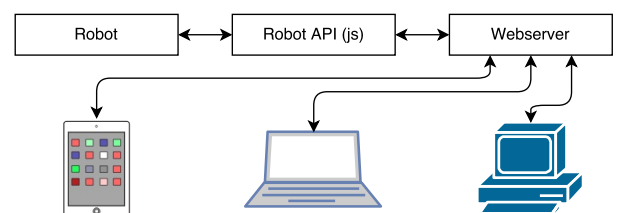
- Web-based GUI, Cross-platform
- Sensor and World Model view

Natural language interpretation

- Natural Language Interpretation using Feature Context Free Grammar (FCFG)
- Speech recognition grammars are generated from FCFG
- Chat interface using Telegram or Slack