RTM Toolbox

Recognition, Tracking and Modelling of Objects

Johann Prankl, Aitor Aldoma,
Alexander Svejda and Markus Vincze

Automation and Control Institute
Vienna University of Technology, Austria

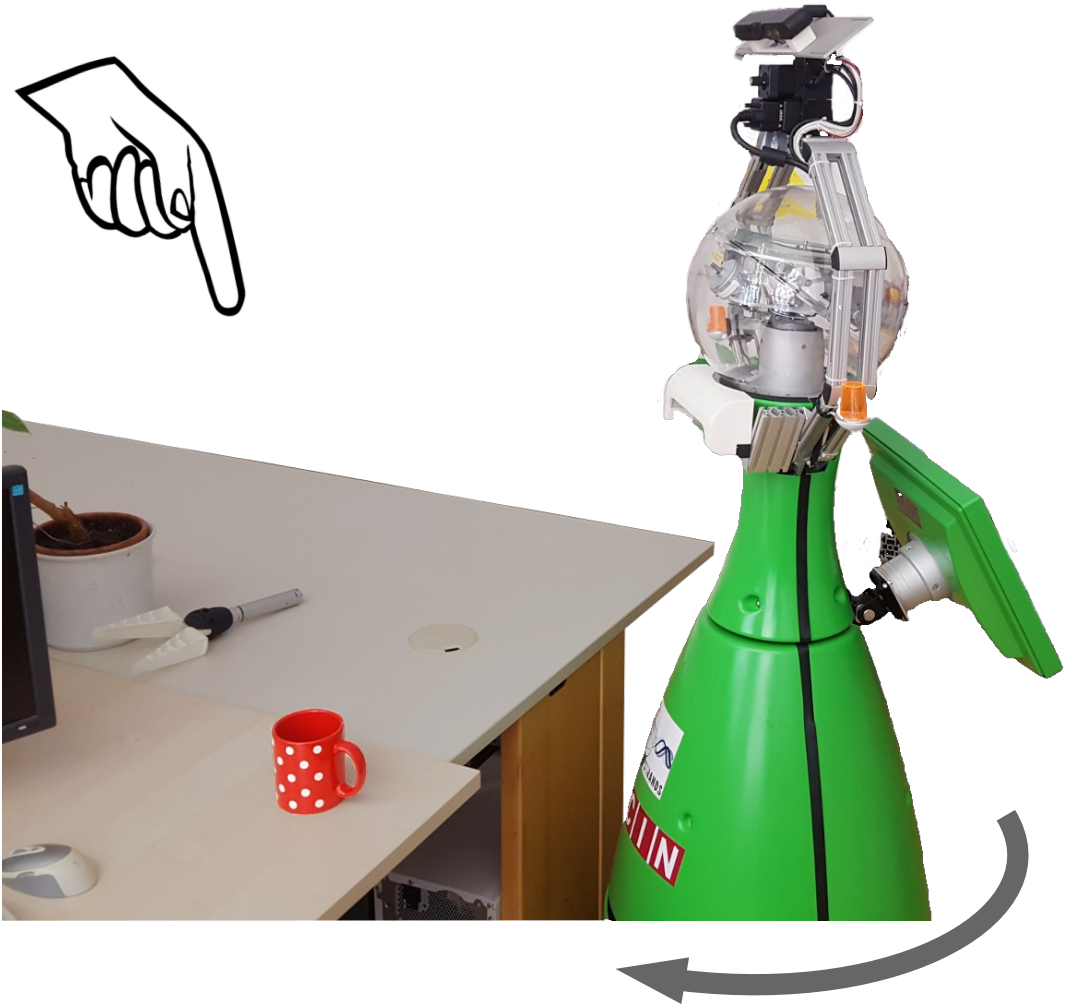
Ljubljana, Slovenia, 22nd March 2016

The idal case of object modelling

Motivation RTM Toolbox

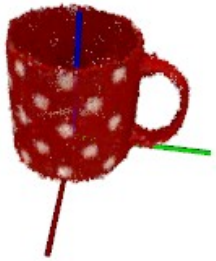
The idal case of object modelling

Motivation RTM Toolbox



Object model for

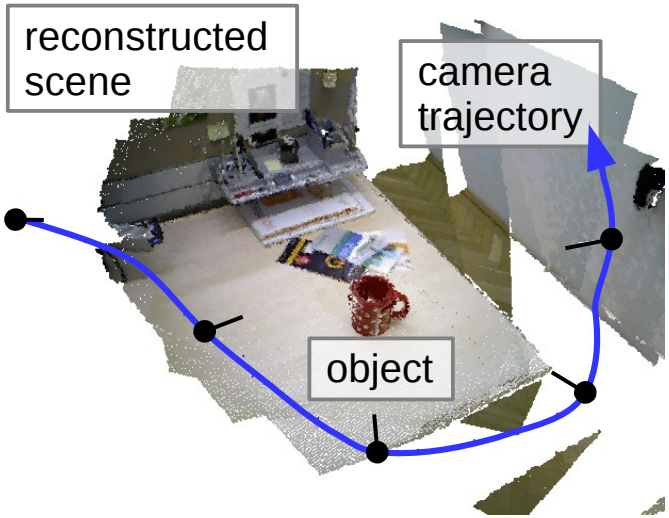
- recognition
- tracking
- visualization



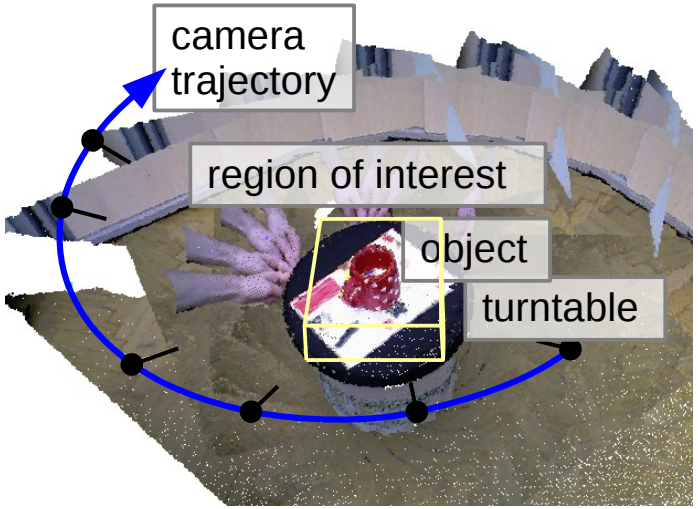
Easy to use modelling with RGBD cameras

Supported Scenarios

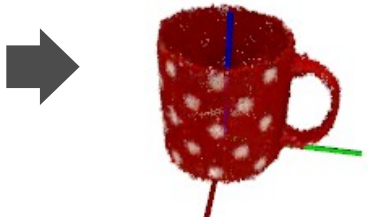
Moving camera, static scene



Static camera, object on turntable

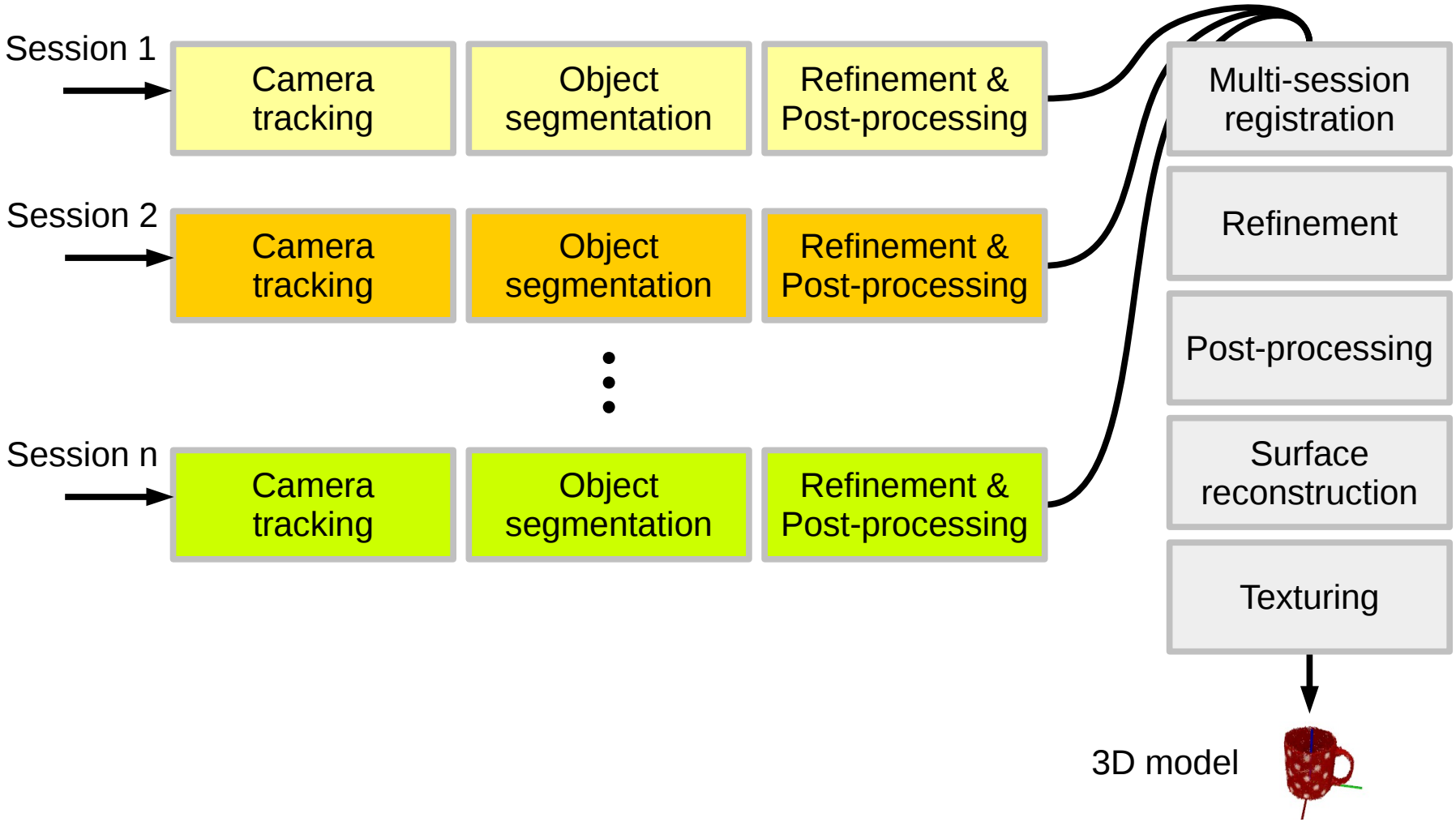


3D model



Support of everyone's need

Overview of the object modelling pipeline



Showcase modelling and tracking

Application: monocular object tracking

FAKULTÄT FÜR ELEKTROTECHNIK UND INFORMATIONSTECHNIK

Faculty of Electrical Engineering and Information Technology

Object Modelling with an RGB-D Sensor and Monocular Object Pose Tracking

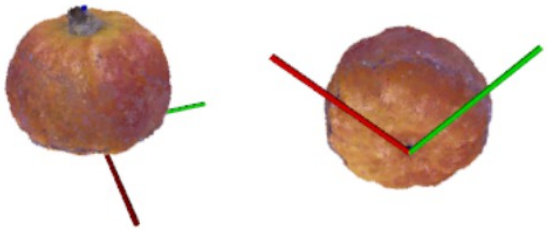
Prankl, Aldoma, Svjeda and Vincze

February 2015

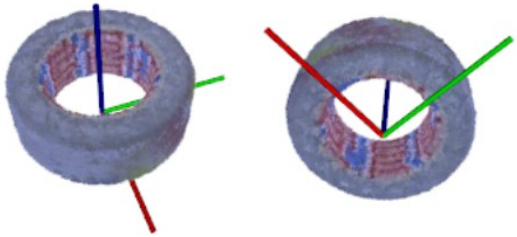
Provide full models

Examples of modells aligned in multiple sessions

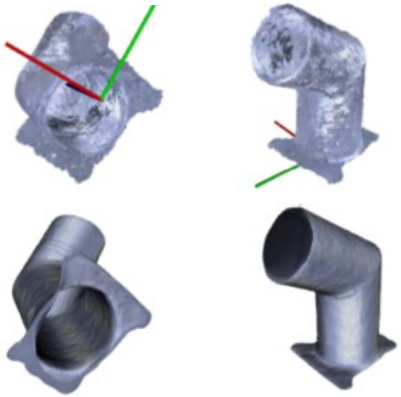
Pumpkin
2 sessions



Tape
2 sessions

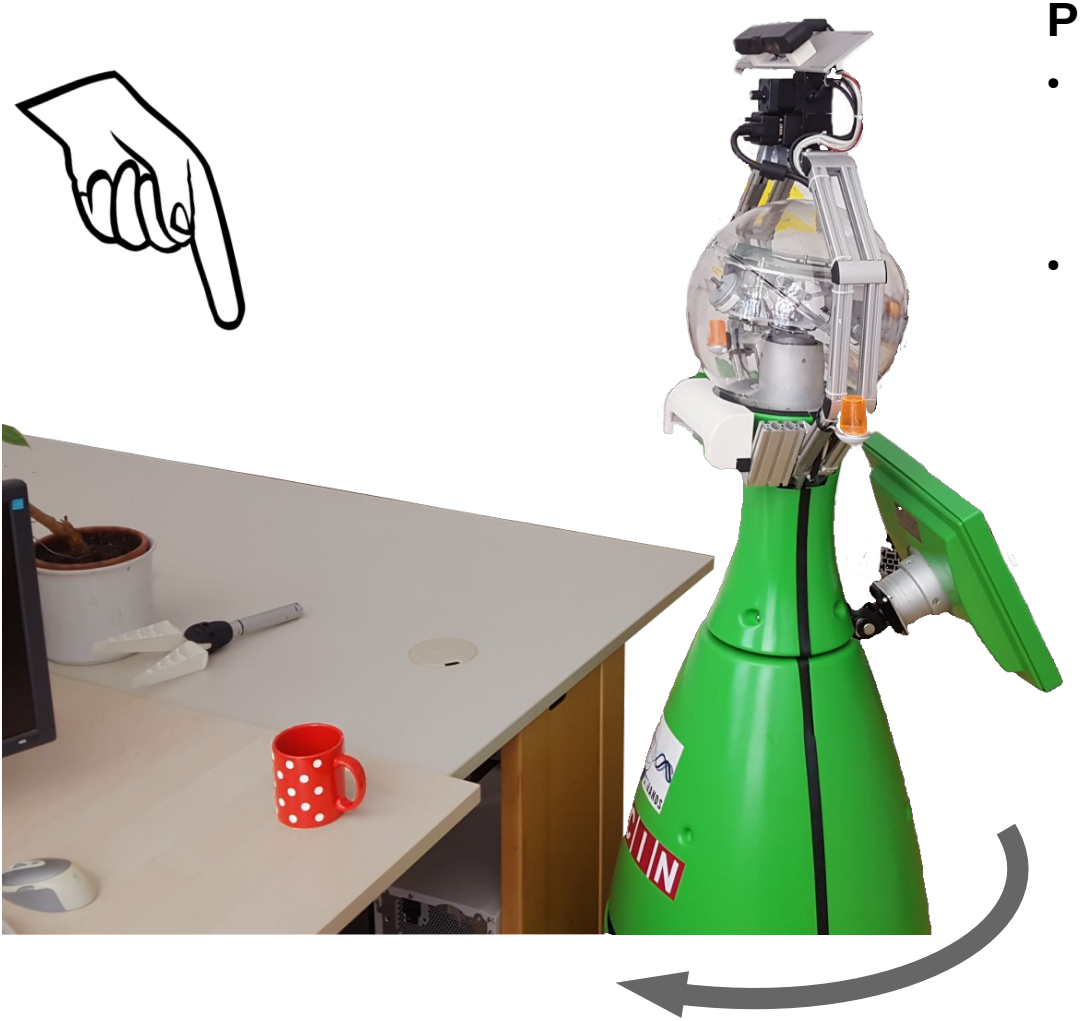


Pipe
3 sessions



Transfer to Industry?

Successful Application in European Projects

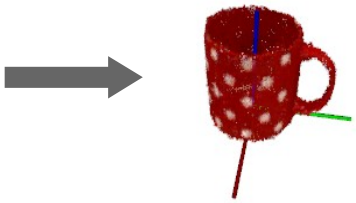


Projects

- **STRANDS (EC FP7)**
  will produce intelligent mobile robots that are able to run for months in dynamic human environments
- **HOBBIT (EC FP7)**
  developed a socially assistive robot that helps seniors and old people at home

Publications

- **IROS 2015, Prankl et al.**
  Overview of the recognition, tracking and modeling toolbox
- **RAL 2016, Fäulhammer et al.**
  Autonomous learning of objects



Transfer to Industry?

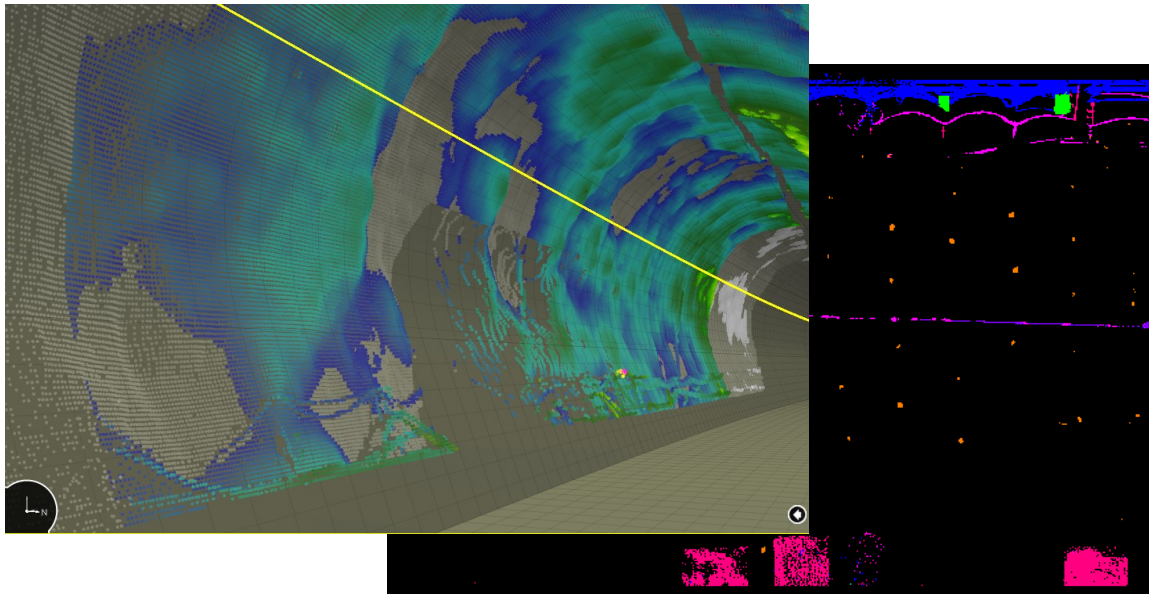
Successful Industrial Application

Semantic segmentation for Robotics:
The Power of 3D Entangled Forests
[RAL 2015, Wolf et al.]

Semantic segmentation for tunnel construction
segment & classify objects in tunnel scans (jetcrete, anchors, lamps, cables...)

Semantic segmentation to compute the soil coverage
segment and classify into soil, living/ dead plants, stones

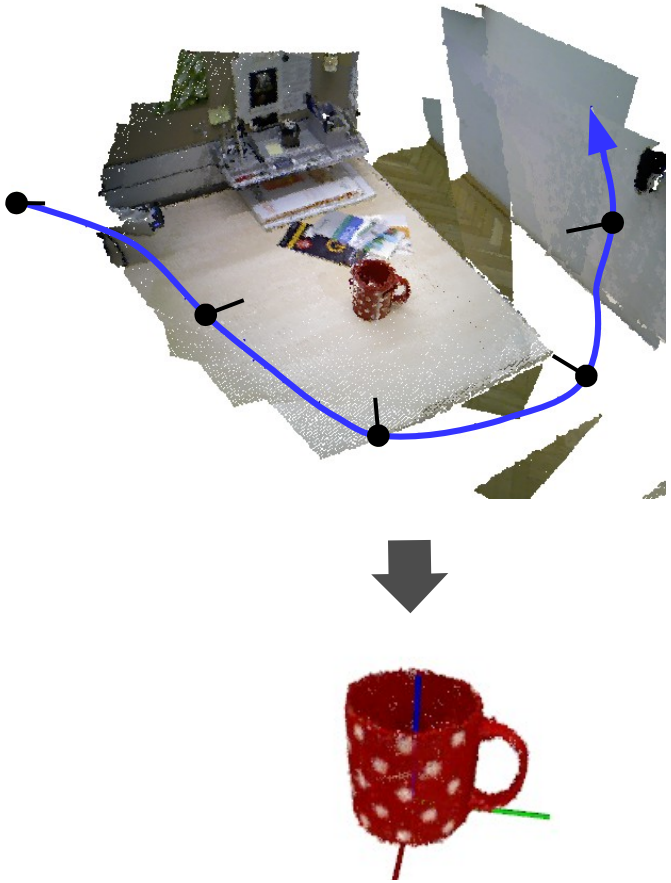
[JR Wieselburg]



Transfer to Industry

Technologies Transferred in Three Years?

- Easy-to-use perception tool, object learning & detection
- Limited to opaque objects, textured and textureless
- Improving resolution/robustness using multiple views



RTM Toolbox

Recognition, Tracking and Modelling of Objects

http://www.acin.tuwien.ac.at/forschung/v4r/software-tools/rtm/