



X-act project

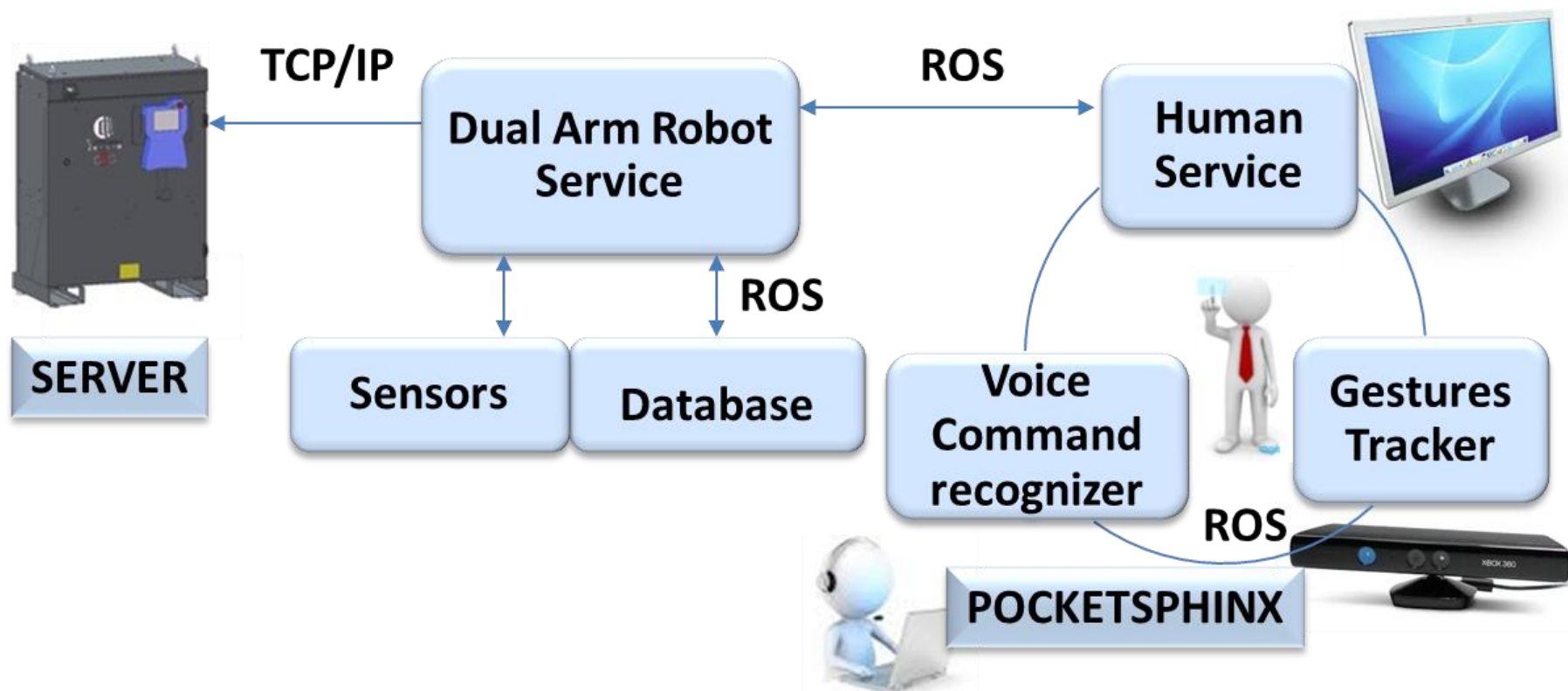
*Dual arm for assembly tasks
ERF 2014, Rovereto*

*Sotiris Makris, Panagiota Tsarouchi
LMS*

Content

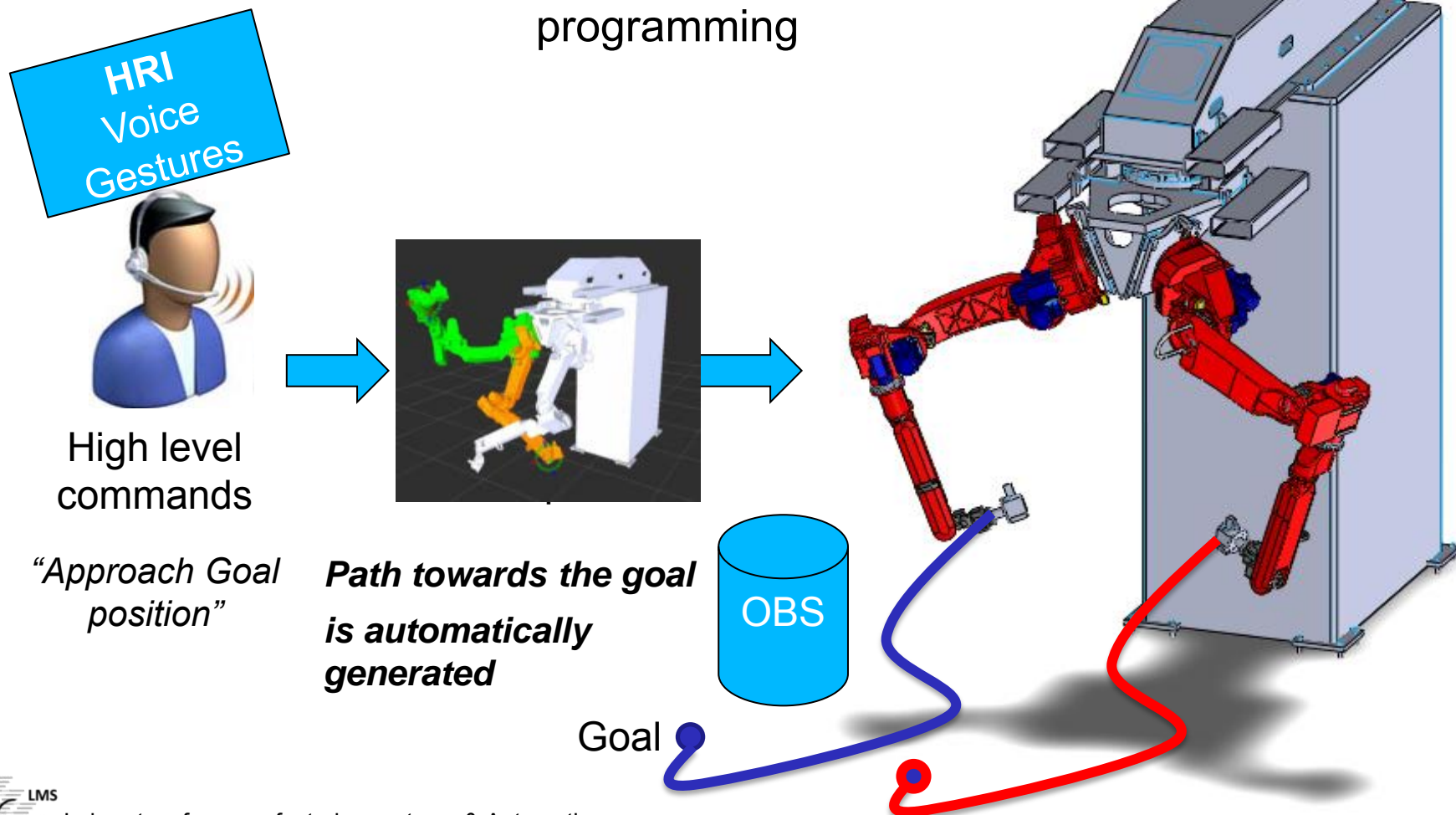
- Service oriented architecture
- Dual arm motion generation
- Human robot cooperation
- Automotive assembly case-application

X-act Service oriented architecture

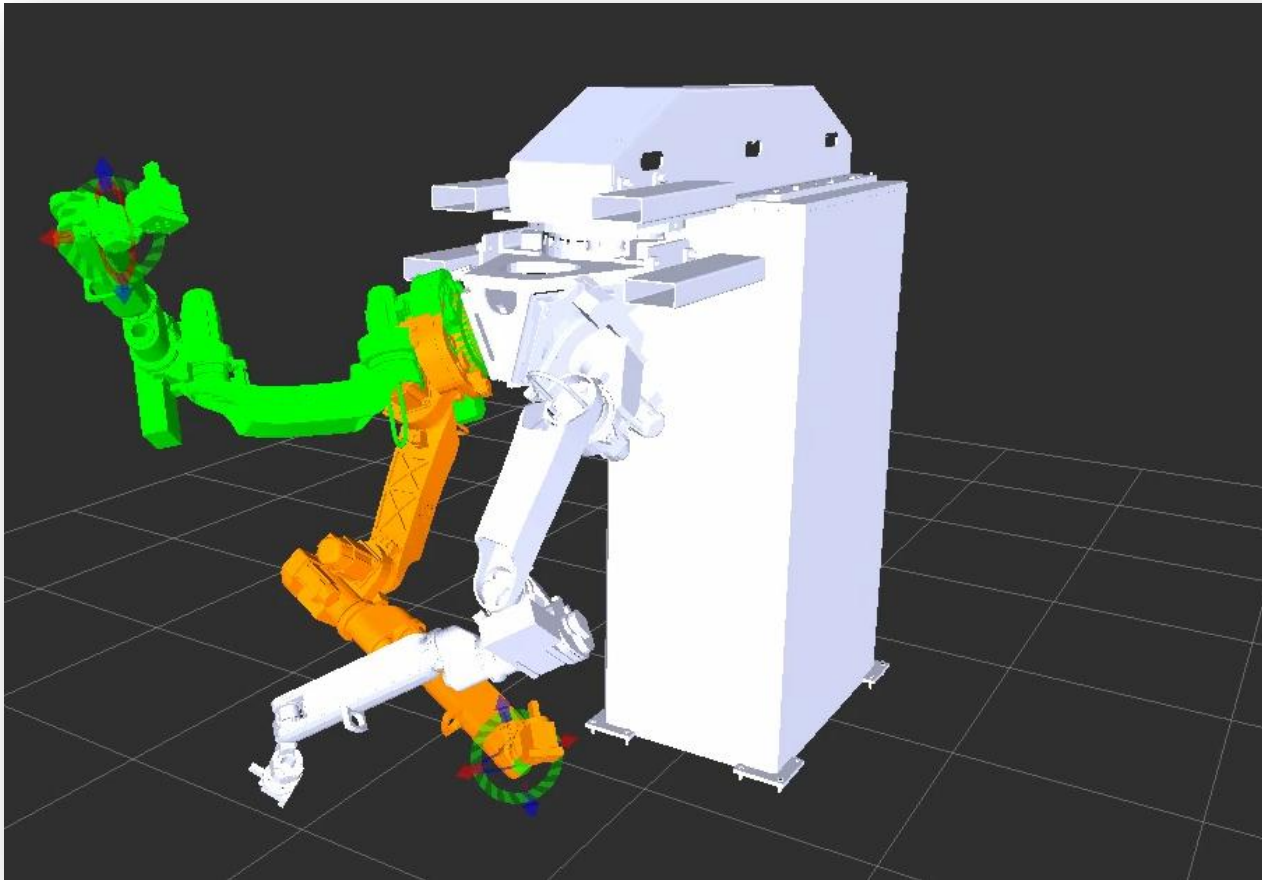


X-act Dual arm motion generation

Free space motion, dual arm-robot programming

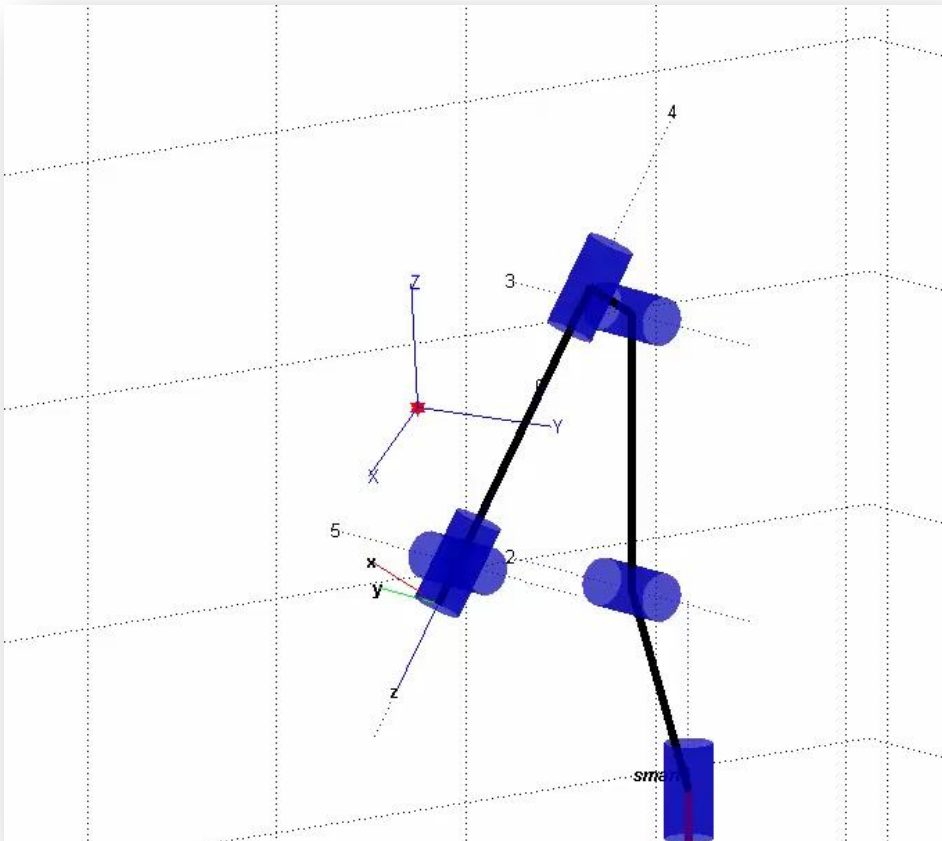


Implementation of COMAU Smart Dual Arm in Moveit!



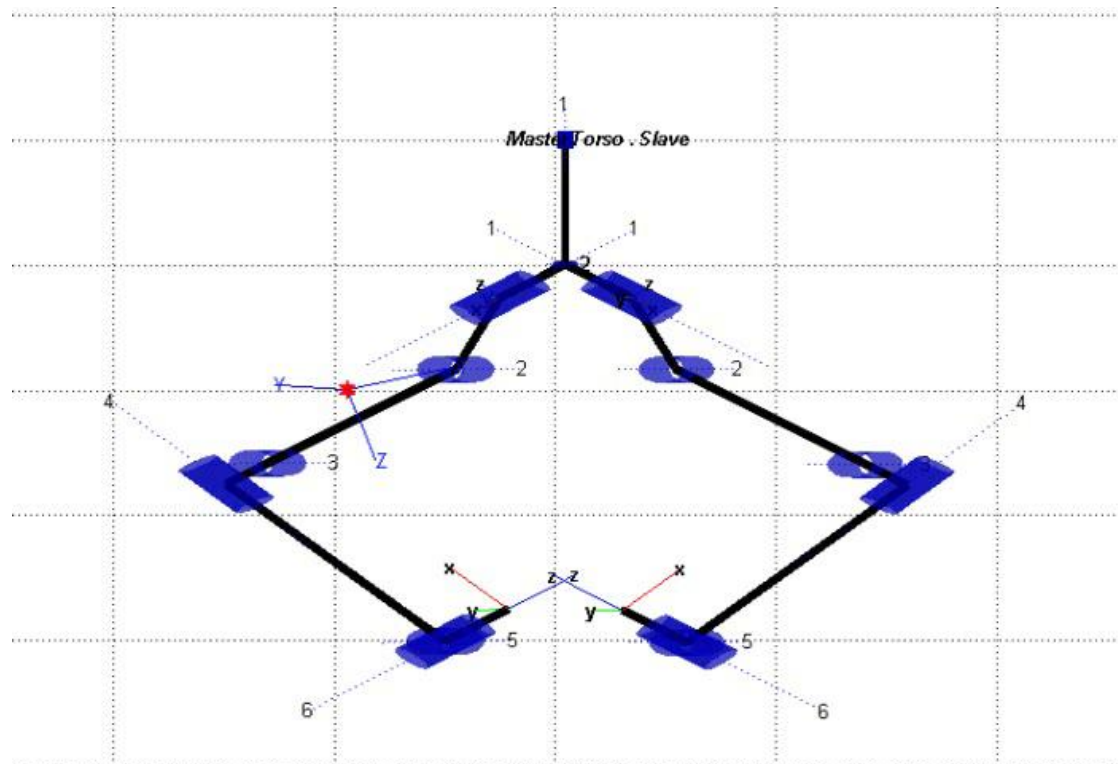
Motion planning search algorithm

Algorithm implementation Matlab-Free space planning

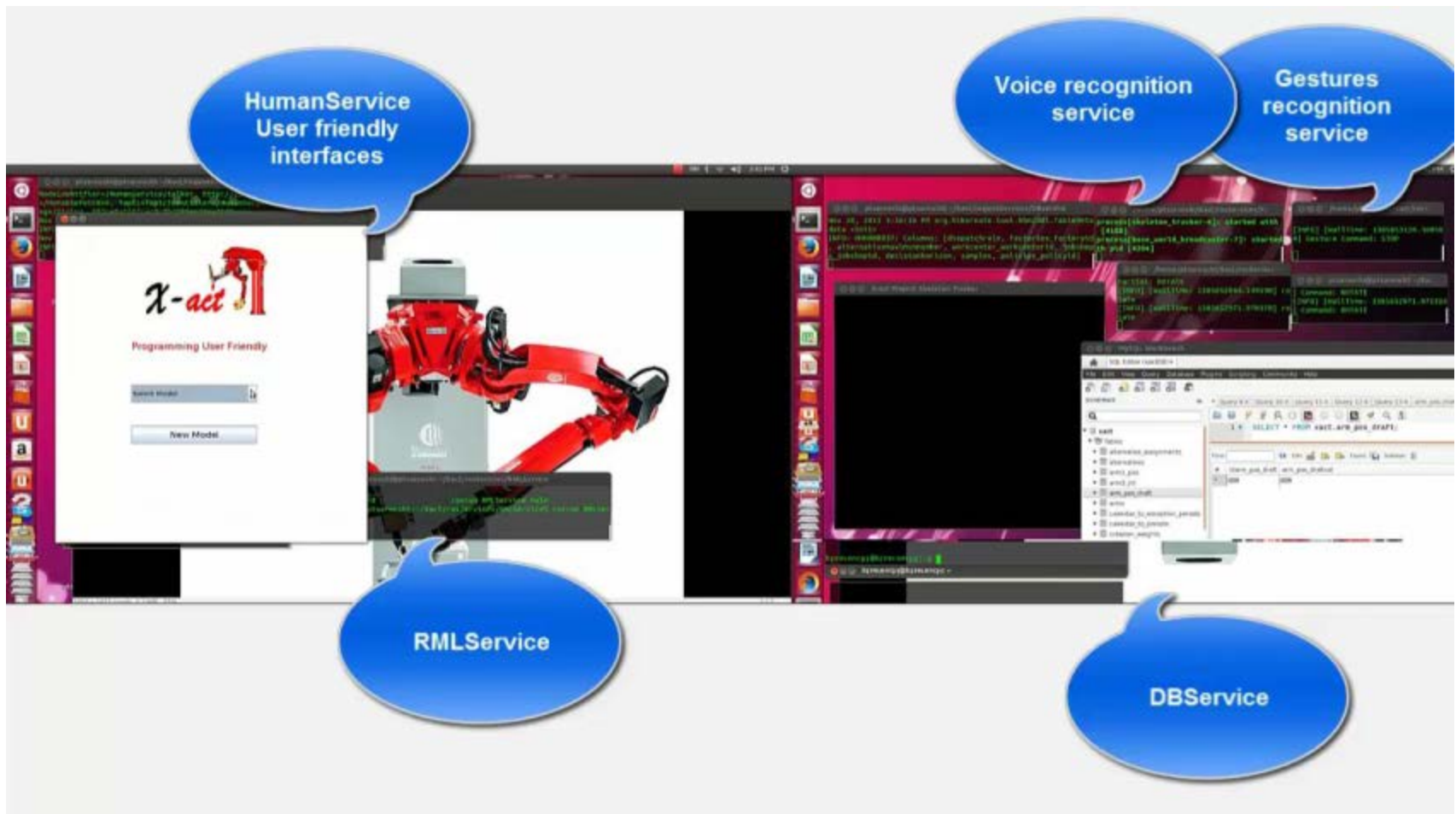


- Matlab Robotics Toolbox
- Smart Six kinematics modelling
- General representation for serial-link manipulators
- Kinematic constraints (Joint limits)
- Trajectory generation for free space
- Distance due to translation and due to rotation criteria

Motion planning search algorithm in Smart Dual arm robot



X-act Dual arm robot commanding-application



Automotive industry-Dual arm robot application

Dashboard assembly case characteristics:

- Parts with complex geometries
- Heavy and flexible parts, that require both arms for manipulation
- Small parts that require dexterous handling
- Flexible parts that involve human

Cell layout

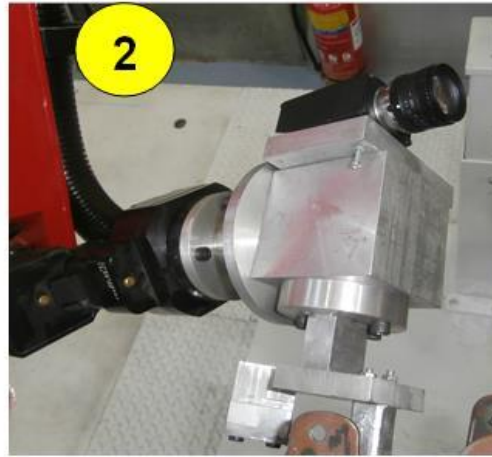


Loading area

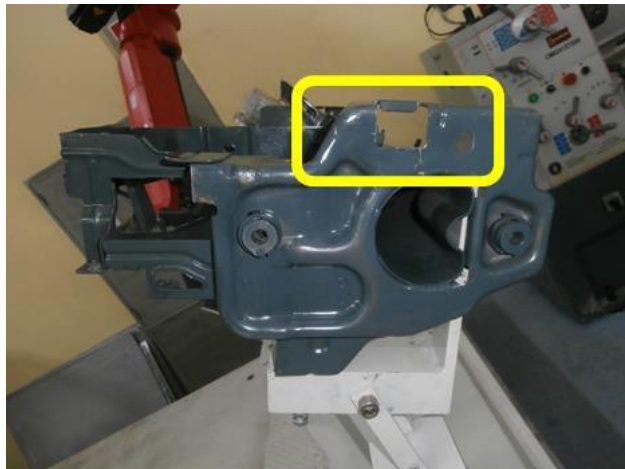


Assembly area

Grasping of traverse with Dual arm robot



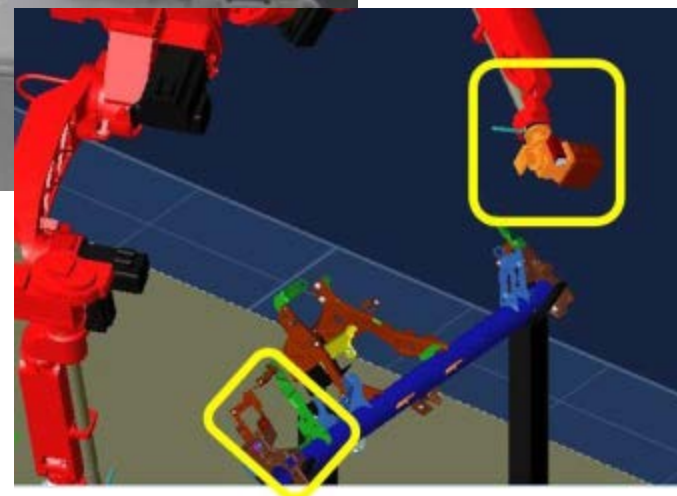
1: Product specific gripper arm1
2: Product specific gripper arm2



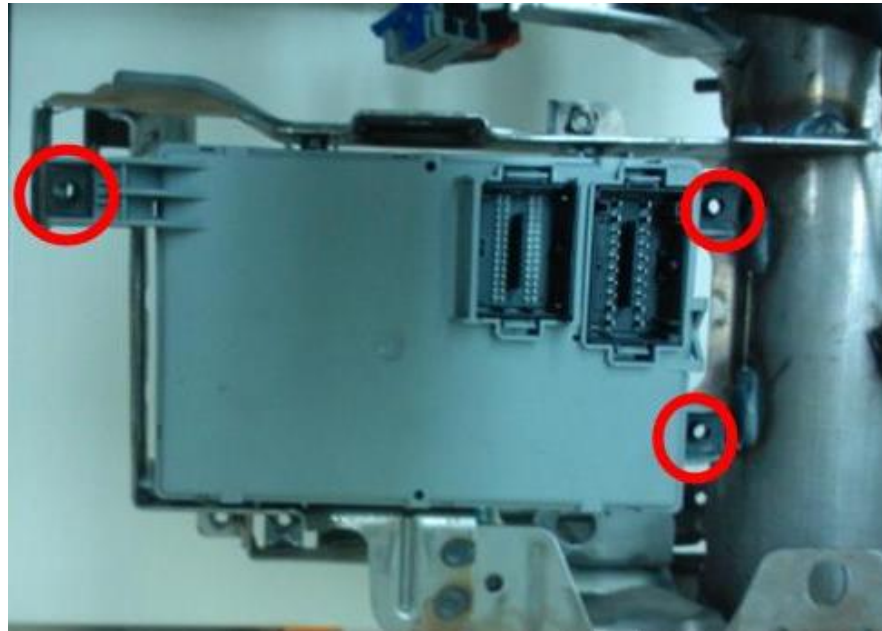
Lift & place traverse



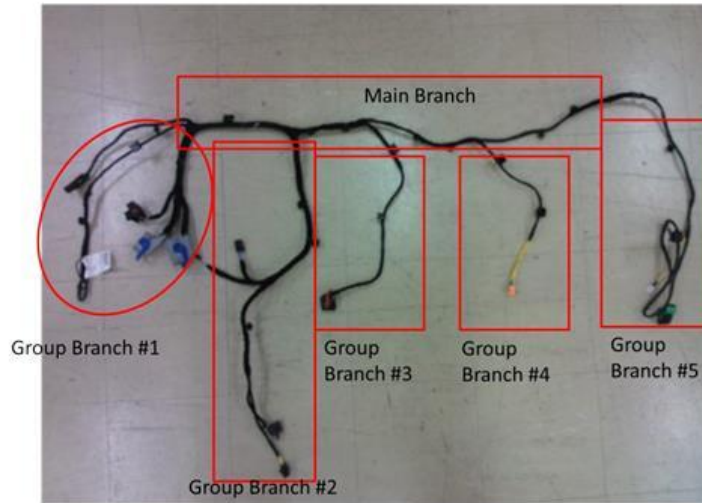
Grasp body computer



Body computer screwing

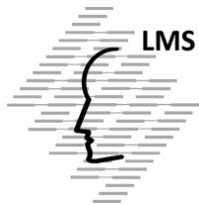


Human Robot collaborative cable installation





Thank you



Laboratory for Manufacturing Systems and Automation
Director: Professor G. Chryssolouris
University of Patras

<http://www.xact-project.eu/>