

Knowledge Representation for Robotized Automation

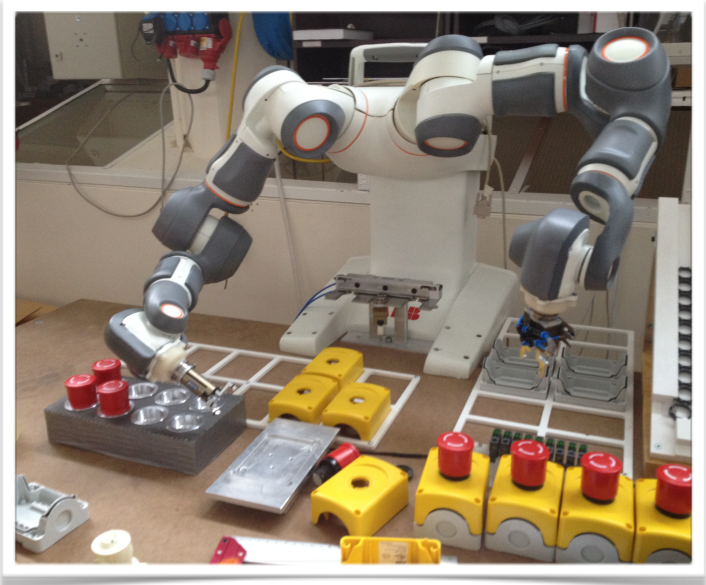
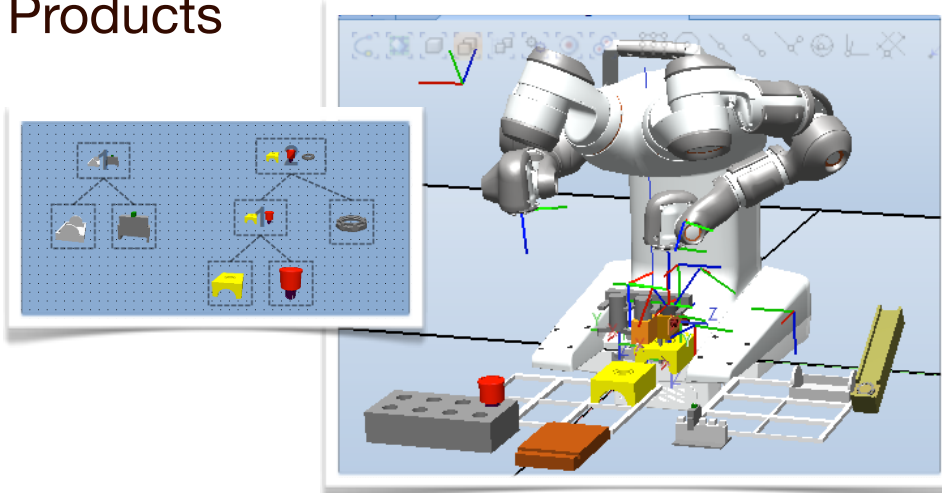
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What does an assistive robot need to know?

European manufacturing typically has small volumes of specialized goods, but it is expensive to have an adapted machine for each product. However, a multipurpose machine, a robot, requires reprogramming for each task. Thus, to be cost efficient, there is a need for an intelligent system that is easy to instruct and that carries out tasks autonomously and robustly.

1. How can the robotized assembly processes be described?

- ▶ Devices, their capabilities and interfaces
- ▶ Tasks to be carried out, their composability
- ▶ Resources e.g time, space, power
- ▶ Products

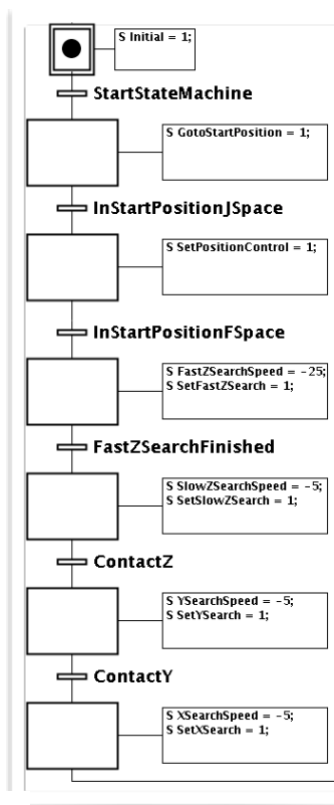


2. Types of planning required

- ▶ AI action planning
- ▶ Trajectory and path planning
- ▶ Assembly-specific planning

3. Kinds of reasoning needed

- ▶ Logical inference
- ▶ Hypothetical reasoning
- ▶ Rule-based reasoning
- ▶ Constraint satisfaction
- ▶ Procedural reasoning including simulation



4. Abstraction levels

- ▶ Assembly graph
- ▶ Constraint graph
- ▶ Scene graph
- ▶ Task graph
- ▶ Finite state machine
- ▶ Data flow models

