Dexterous manipulation using mobile dual arm robots

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Current Industrial Practice & Motivation

Europe is the home to around 2.3 million industrial manufacturing SMEs

Link to THOMAS Main Concept video
“Enabling mobility on products and resources”

Mobile Product Platform (MPP)

Mobile Robot Platform (MRP)

Environment Perception

“Dynamic balancing and redirecting to stations”

“Human-Robot & Robot-Robot collaboration in a safe way”

Product & Process Perception

“Perception & skills to automatically program and execute multiple tasks”

Human awareness
✓ Mobile Robot Platforms (MRP)
✓ Autonomous navigation across the shopfloor in a safe way
✓ Perform a variety of tasks using on-board tooling
✓ Collaborate with humans acting as assistant to them
✓ Collaborate with other mobile resources through share perception
✓ **3D vision** enables **process perception** for manipulation

✓ Process **context awareness** perception

✓ In cell & Cell to Cell navigation

✓ Multi sensors based **enhance safe navigation**

**Environment and process perception**

Autonomous Object detection & Motion generation
Simplified programming and execution

- CAD based **autonomous program generation**
- Collision free **grasp, path & motion planning**
- Offline **robot skills composition**
- Online **skills refinement** based on sensor input
- **Programming by mimesis** for flexible parts dual arm manipulation
✓ **Hybrid Safety**: fusing 2D – 3D sensor data

✓ **Direct H-R interaction**: (voice, gestures, wearables)

✓ **In – direct H-R interaction**: (human intention detection)

✓ **Manipulator** End of Arm Safety

✓ **Human – Robot workspace supervision**
THOMAS 1st Demonstration in AERNNOVA
For more information:

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