

Workshop on Perception- Models for Task Generalization in Agile Manufacturing

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Agenda

14:00 Introduction by the moderators/definition of key questions

14:10 Presentations:

Understanding of Process-Workflow through Identification of Action Constraints in Observed Motions, Prof. Darius Burschka, TU Munich, Germany

Perception for Long-Term Operation Enabling Adaptation To Changing Environments, Dr. Martin Magnusson, University of Orebro, Sweden

Perception-enabled Use Cases in Agile Manufacturing, Dr. Michael Suppa, Roboception GmbH, Germany

Shadow Robot Perception Challenges, Andriy Petlovanyy, Shadow Robot Company, UK

15:00 Interactive session/round table discussion of the key questions with all speakers and the audience

15:20 Conclusion for roadmapping and take home message

15:30 End of workshop

Link to the website: <http://roboception.com/erf2018>

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Sense. Reason. Act.

- Perception and manipulation systems must be tightly coupled
- Flexible production
- Real-time requirements
- Users need intuitive and integratable robotic solutions
- Ready-to-use and easy-to-use functionality



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Agile Manufacturing

Perception is one of the key technologies for flexible production

- In flexible and agile production, robots must be able to reliably detect and locate work pieces and human collaborators.
- In logistics, manual work is still pre-dominant due to the complexity of tasks and the variation of objects.
- Individual engineering of solutions is costly and does not scale

Agile Manufacturing

Requires a fast adaptation of a system to new environments

- Avoid approaches that require an extensive re-training of the system in changing environments
- Combination of learning and model based approaches show great potential
- Separation of the perception part from the general task description
- Low level perception modules or front-layers in the learning approaches.
- Business models for open source software and commercial platforms including data models

Key questions

1. Which AI platforms and perception toolboxes are currently used in industrial automation and logistics?
2. Which are major challenges and potential step changes i.e., what is required from the tools/platforms in order to increase flexibility in production
3. Where do you see the largest gaps in the innovation chain?
4. **How to cover dynamics in the scene?**
5. Which business models in terms of data/software tools/platforms do you see and how do open source tools and commercial tools adapt to these?

Statements

- It is necessary to deal with with dynamics/motion in the scene
- Workflow monitoring system, object centric approach, visual learning system
- New task representations going away from metric representations
- Extension of data bases with action labels – check with autonomous driving community
- Using flow information in mobile applications to support navigation
- Benchmarks and reference implementations
- Data and algorithm testing
- Ground truth? Quality metric in terms of accuracy, cycle time
- Benchmark for grasping and manipulation activity going on
- Neutral way of data generation independent of the sensor

Perception Group

Closing

Workshop Slides:

<http://roboception.com/erf2018>

Interest in Participation in TG Perception:

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