7TH CONFERENCE ON
LEARNING FACTORIES
APRIL 4TH – 5TH 2017

TOGETHER WITH
INNOCOM 2017
7TH CONFERENCE ON LEARNING FACTORIES
—EXHIBITORS

LERNFABRIK 4.0 – FESTO

The comprehensive learning system from Festo Didactic on the subject of industry 4.0 offers various mediation levels from individual modules to the complete learning platform in a plant network. The appropriate level depends on the degree of experience and qualification focus of the user. For example, the CP Factory provides access for research and teaching on the technologies and applications of industry 4.0. The platform demonstrates the production of the future in a decentralized, intelligent network.

BOSCH REXROTH

A complete industrial 4.0 system in miniature - this is the training system mMS 4.0. The system is a practical demonstration of a cube assembly from the removal from a magazine via processing with a press to the storage in the high-bay warehouse. Compiled from series components, completely interconnected, programmable and comprehensively secured. The system can be flexibly supplemented by cells, e.g. with a 6-axis articulated robot. The entire system or individual stations are delivered completely assembled, installed and programmed. You can get started right away.

B&R

B&R is the technological leader in automation solutions and the largest private company in this field. At the Learning Factory Conference, the Education Network of B&R shows innovative laboratory systems for education. The laboratory systems have been developed to specifically train skills that are important for the implementation of industry 4.0 solutions.

B&R supports the TU Darmstadt with the integration of Industrie 4.0 solutions with the production control system APROL in Process Data Acquisition, Condition Monitoring and Energy Monitoring.

7TH CONFERENCE ON LEARNING FACTORIES
—AGENDA

Tuesday, April 4th 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>13:00</td>
<td>Welcome coffee and registration at the ETA-learning factory*</td>
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<tr>
<td>13:45</td>
<td>Welcome and opening</td>
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<td>14:30</td>
<td>CIP workshop</td>
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<td>Implementation of a value stream design</td>
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<td>Group 1</td>
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<td>Group 4</td>
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<td>16:00</td>
<td>Coffee Break</td>
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<td>16:30</td>
<td>ETA workshop</td>
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<td>Assessment of energy efficiency potentials in production</td>
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<td>Group 2</td>
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<td>Group 1</td>
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<td>Group 3</td>
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<tr>
<td>18:00</td>
<td>Dinner with live music &amp; showact at the ETA-learning factory</td>
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Wednesday, April 5th 2017

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>08:00</td>
<td>Welcome coffee and registration HMZ*</td>
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<tr>
<td>09:00</td>
<td>Conference opening - Prof. R. Bruder L4</td>
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<tr>
<td>09:15</td>
<td>Introduction - Prof. E. Abele &amp; Prof. J. Metternich</td>
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<tr>
<td>09:45</td>
<td>Keynote Prof. J. Kluge</td>
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<td>10:20</td>
<td>Coffee break</td>
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<td>10:40</td>
<td>Learning factory concepts</td>
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<td>‘Industrie 4.0’ production systems</td>
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<td>Competency development</td>
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<td>13:00</td>
<td>Lunch</td>
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<td>14:00</td>
<td>‘Industrie 4.0’ use cases</td>
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<td>14:40</td>
<td>Integration of digital learning</td>
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<td>15:00</td>
<td>Coffee break</td>
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<tr>
<td>16:00</td>
<td>Conference wrap-up and outlook L4</td>
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* Eugen-Kogon-Straße 4, 64287 Darmstadt
* Universitäts- und Landesbibliothek Darmstadt, Franziska-Braun-Straße 10, 64287 Darmstadt
### Conference opening and keynotes

#### Learning factory concepts

**Room L4|02 201&202**

- **10:20** Coffee break

- **10:40** 1st Keynote - M. Habermeier
  Learning factory concepts at Daimler AG

- **11:00** D. Flum - A systematic approach for designing learning environments for energy efficiency in industrial production

- **11:20** S. Cremer - Assessment of a learning factory morphology for a hybrid production infrastructure

- **11:40** A. Kreß - Utility-based configuration of learning factories using a multidimensional, multiple-choice knapsack problem

- **12:00** J. Buergin - Demonstration of a concept for scalable automation of assembly systems in a learning factory

- **12:20** A. Schlegel - Developing and harnessing the potential of SMEs for eco-efficient flexible production

- **12:40** Prof. I. Veza - Development of assembly systems in lean learning factory at the University of Split

- **13:00** Lunch

### ‘Industrie 4.0’ production systems

**Room L4|02 340**

- **10:20** Coffee break

- **10:40** Keynote - Prof. T. Bauernhansl
  Cyber-physical production systems – Concepts for manufacturing value-adding systems

- **11:00** J. Schuhmacher - An intelligent bin system for decentrally controlled intralogistic systems in context of Industrie 4.0

- **11:20** P. Hold - Planning and evaluation of digital assistance systems

- **11:40** H. Stern - Development of a model for the integration of human factors in cyber-physical production systems

- **12:00** C. Prinz - Implementation of a learning environment for an Industrie 4.0 assistance system to improve the overall equipment effectiveness

- **12:20** J. Klöber-Koch - Knowledge-based decision making in a cyber-physical production scenario

- **12:40** J. Sauza Bedolla - A novel approach for teaching IT tools within learning factories

- **13:00** Lunch

### ‘Industrie 4.0’ use cases

**Room L4|02 340**

- **14:00** Keynote - Dr. R.Pittschellis
  Learning factories for Industry 4.0 between education and research

- **14:20** F. Ranz - Capability-based task allocation in human-robot collaboration

- **14:40** J. Böllhoff - Development of an optical object detection solution for error prevention in a learning factory

- **15:00** B. Brenner - Digital twin as enabler for an innovative digital shopfloor management system in the ESB logistics learning factory at Reutlingen-University

- **15:20** H. Karre - Industry 4.0 and its depiction in learning factories – The case of the LeanLab at Graz University of Technology

- **15:40** Y. S. Gloy - Textile learning factory 4.0 – Preparing Germany’s textile industry for the digital future

- **16:00** Coffee break

- **16:20** T. Schlegel - Standardized coordinate system for factory and production planning

### Learning factory concepts

**Room L4|02 201&202**

- **14:00** 2nd Keynote - Dr. T. Gartzen
  Producing an electric car in a hybrid learning factory

- **14:20** J. Enke - Introducing a maturity model for learning factories

- **14:40** M. Juraschek - Experiencing closed loop manufacturing in a learning environment

- **15:00** Prof. H. ElMaraghy - Integrated product/system design and planning for new product family in a changeable learning factory

- **15:20** F. Baena Restrepo - Learning factory: The path to Industry 4.0

- **15:40** Prof. S. Simons - Learning in the AutFab – the fully automated Industrie 4.0 learning factory of the University of Applied Sciences Darmstadt

- **16:00** Coffee break

- **16:20** M. Tisch - Potentials and limits of learning factories in research, innovation transfer, education, and training

- **16:40** S. J. Blöchl - Simulation game for lean leadership - shopfloor management combined with accounting for lean

- **17:00** O. Madsen - The AAU smart production lab for teaching and research in emerging digital manufacturing technologies

- **17:20** T. H.-J. Uhlemann - The digital twin: Demonstrating the potential of real time data acquisition in production systems

- **17:40** O. Ogorodnyk - Roller skis assembly line learning factory – development and learning outcomes

### Conference wrap-up and outlook

**18:00**
Integration of digital learning
Room L4|02 338

15:00  Keynote - Dr. Dimitris Mavrikios
A web-based application for classifying teaching and learning factories

15:20  M. Görke - Employee qualification by digital learning games

15:40  B. Thiede - Enhancing learning experience in physical action-orientated learning factories using a virtually extended environment and serious gaming approaches

16:00  Coffee break

16:20  S. Steinbuß - HANDELkompetent - situation-aware learning in retail

16:40  A. Ullrich - Developing industrial IoT competences in the areas of organization, process, and Interaction - A learning factory concept

17:00  Dr. S. Braunreuther - Teaching smart production: Concept of the learning factory for cyber-physical production systems (LVP)

17:20  B. C. Müller - Procedure for experiential learning to conduct material flow simulation projects, enabled by learning factories

Competency development
Room L4|02 301

10:20  Coffee break

10:40  1st Keynote - Prof. J. Metternich & Prof. R. Tenberg
Competency development – a discussion from two perspectives

11:20  Dr. J. Longmuß - Agile learning for vocationally trained expert workers. Expanding workplace-based learning one sprint at a time

11:40  L. Büth - Bridging the qualification gap between academia and industry in India

12:00  E. Groß - Changing requirements of competence building due to an increase of personalized products

12:20  C. Hertle - Innovative approaches for technical, methodological, and socio-communicative competency development in production areas

12:40  L. C. Müller-Frohmeyer - Introducing competency models as a tool for holistic competency development in learning factories: Challenges, example and future application

13:00  Lunch

14:40  2nd Keynote - Prof. G. Lanza - Concept development for verification of the didactic competence promotion for the learning factory on global production

15:00  Prof. S. Kinkel - Critical competencies for the innovativeness of value creation champions: Identifying challenges and work-integrated solutions

15:20  J. Hambach - Evaluation of coaching success for the continuous improvement process - How to distinguish a good leader in CIP?

15:40  J. Wullbrandt - Lean stress sensitization in learning factories

16:00  Coffee break

16:20  Prof. K. Schützer - Learning environment to support the product development process

16:40  M. Reuter - Learning factories’ trainings as an enabler of proactive workers’ participation regarding Industrie 4.0

17:00  B. Mayer - Modular smart production lab

17:20  N. Kreggenfeld - Teaching methods-time measurement (MTM) for workplace design in learning factories

17:40  J. Decius - The competence management tool (CMT) – A new instrument to manage competences in small and medium-sized manufacturing enterprises