

---

Dagstuhl Seminar 23362

**Decision-Making Techniques for Smart  
Semiconductor Manufacturing**

Opening Session

---

# Agenda

---

- ▷ Workshop Organizers – Introduction (John Fowler)
- ▷ Workshop Participants – Introduction (Hans Ehm)
- ▷ About the Seminar in General (John Fowler)
- ▷ Detailed Workshop Program (Lars Mönch)

## Organizers

---

- ▷ Chen-Fu Chien, Tsinghua Chair Professor, NTHU-TSMC Center for Manufacturing Excellence & STEP Consortium, National Tsing Hua University, Taiwan
- ▷ Hans Ehm, Senior Principal Supply Chain, Head of Supply Chain Innovations, Infineon Technologies AG, Germany
- ▷ John W. Fowler, Motorola Professor of International Business, Arizona State University, USA
- ▷ Lars Mönch, Professor, Chair of Enterprise-Wide Software Systems, University of Hagen, Germany

# Agenda

---

- ▷ Workshop Organizers – Introduction and Acknowledgements (Chen-Fu Chien)
- ▷ Workshop Participants – Introduction (Hans Ehm)
- ▷ About the Seminar in General (Lars Mönch)
- ▷ Detailed Workshop Program (John Fowler)

# Agenda

---

- ▷ Workshop Organizers – Introduction (John Fowler)
- ▷ Workshop Participants – Introduction (Hans Ehm)
- ▷ About the Seminar in General (John Fowler)
- ▷ Detailed Workshop Program (Lars Mönch)

# Why are you here?

---

- ▷ Track record and accomplishment in semiconductor/smart manufacturing-related modeling & analysis R&D and/or practice
- ▷ Desire to see the field advance
- ▷ Opportunity for unique intellectual engagement with peers and colleagues
- ▷ Prospect of new R&D challenges

# What are the goals?

---

- ▷ The major objective of the proposed seminar is related to developing a research agenda for making smart semiconductor manufacturing decisions and the related information systems to empower flexible decisions for smart production. The research agenda will be developed around the following two main topics:
  - ▷ **Topic 1:**
    - Novel decision-making approaches that exploit the huge amount of available data and orchestrate the interrelated decisions
  - ▷ **Topic 2:**
    - Future information systems for decision support and facilitating digital transformation

# What are the goals?

---

- ▷ one of the expected outcomes:
  - a (significant) draft of a concept for a simulation testbed which allows for assessing smart planning and control decisions in the semiconductor industry
  - includes a discussion of the extensibility of existing simulation testbeds
  
- ▷ Identify and realize new opportunities for meaningful collaborations



# What is the process?

---

- ▷ Panels with a broader view
  - Presentations
  - Discussions
- ▷ Panels for more specific questions:
  - Presentations
  - Discussions
- ▷ Breakout sessions
  - Collaboration
  - Report out to group
- ▷ Daily synopsis and discussion

# Ground Rules

---

- ▷ We are exploring this space, not erecting monuments
- ▷ We are peers, and can agree to disagree
- ▷ We want to identify the future research problems, not solve them, or decide how they must be solved
- ▷ We want to achieve consensus, but we will include minority opinions

# Agenda

---

- ▷ Workshop Organizers – Introduction and Acknowledgements (Chen-Fu Chien)
- ▷ Workshop Participants – Introduction (Hans Ehm)
- ▷ About the Seminar in General (John Fowler)
- ▷ Detailed Workshop Program (Lars Mönch)

# Workshop Program

---

## ▷ Monday, September 4

- 08.30 Convene: introductions, administrative matters, process
- 09.15 Smart Manufacturing (John Fowler, Lars Mönch)
- 10.15 Break
- 10.45 Industry Overview (Adar Kalir, Marcel Stehli)
- 12.00 Lunch & Free Time
- 14.00 Industry Overviews (Alexandru Prisacaru, Thomas Ponsignon)
- 15.30 Break
- 16.00 Industry Overview (Hans Ehm, Peter Lendermann)
- 18.00 Dinner

# Workshop Program

---

## ▷ Tuesday, September 5

- 08.30 Convene: Recap previous day, discuss goals for today
- 08.45 Machine Learning (Gian Antonio Susto, Cathal Heavey, Young Jae Jang)
- 10.15 Break
- 10.30 Simulation Modeling (Andrea Matta, Michael Hassoun, Oliver Rose)
- 12.00 Lunch & Free Time
- 14.00 Order-lot Pegging/Borderless Fab/Security (Liji Shen, Raphael Herding, Giulia Pedrielli)
- 15.30 Break
- 16.00 Discussion
- 18.00 Dinner

# Workshop Program

---

## ▷ Wednesday, September 6

- 08.30 Convene: Recap previous day, discuss goals for today
- 08.45 Scheduling (Stephane Dauzere-Peres, Jessica Hautz, Rohan Korde)
- 10.15 Break
- 10.30 Scheduling/Machine Learning (Daniel Schorn, Mahsa Shekari)
- 12.00 Lunch & Free Time
- 14.00 excursion/outing (wine tasting???)

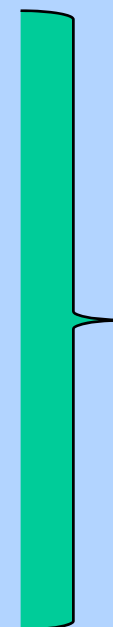
# Workshop Program

---

## ▷ Thursday, February 7

- 08.30 Convene: Recap previous day, discuss goals for today
- 08.45 Breakout I: What are the state-of-the-art and future needs for ML-based decision support? (for different (smart) planning and control tasks)

Young Jae Jang	Cathal	Thomas
Hans	Lars	John
Jessica	Stephan	Masha
<u>Henrik</u>	Rohan	Dominik
Peter	William	Liji
Marcel	Giulia	Andrea
Oliver	Alexandru	Daniel
		Michael



**Young Jae Jang, Cathal & Thomas supported by Henrik to prepare 10' results for 16:00 today**

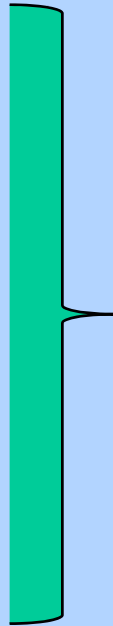
# Workshop Program

---

## ▷ Thursday, February 7

- 10.15 Break
- 10.30 Breakout II: What are the state-of-the-art and future needs for simulation-based decision support? (for different (smart) planning and control tasks)

Andrea	Michael	Oliver
Lars	Hans	John
Jessica	Stephan	Peter
Thomas	Rohan	Cathal
Marcel	<u>William</u>	Daniel
Dominik	Giulia	Henrik
Alexandru	Masha	Liji
Young Jae Jang		



**Andrea,  
Michael &  
Oliver  
supported by  
William to  
prepare 10'  
results for  
16:15 today**



# Workshop Program

---

## ▷ Thursday, February 7

- 14.00 Breakout III: Analysis of a) Sustainability Issues b) Information Systems Involved c) Prepare common session with Multi-objective Optimization seminar.

<b>Sustainability Issues</b>	<b>Information systems &amp; Ontologies</b>	<b>Multi-Objective Optimization Exchange</b>
<b>Lars</b>	<b>Hans</b>	<b>John</b>
Stephane, Michael, William, Daniel	Hendrik, Peter, Jessica, Marcel, Andrea	Dominik, Thomas Masha, Giulia, Cathal

- 15.30 Break
- 16.00 Breakout reports and discussion
- 17.00 Exchange with Multiobjective Team
- 18.00 Dinner

# Workshop Program

---

## ▷ Friday, September 8

- 08.30 Convene: Recap previous day, discuss goals for today
- 08.45 Panel: Core Elements of a Simulation Testbed which allows for assessing smart planning and control decisions in the semiconductor industry. Moderated by John

<b>Cathal</b>	<b>Peter</b>	<b>Guilia</b>	<b>Andrea</b>
---------------	--------------	---------------	---------------

- 10.15 Break
- 10.30 Wrap Up Session
- 12.00 Adjourn & Lunch

# Special Issue

---

- ▷ Flexible Services and Manufacturing Journal  
“Decision-Making Techniques for Smart Semiconductor Manufacturing”

Guest editors: Lars Mönch, Chen-Fu Chien, Hans Ehm, John W. Fowler

## **Important Dates (tentative):**

- Submission deadline: February 1st, 2024
- Completion of first-round reviews: May 1st, 2024
- Revised papers due: August 1st, 2024
- Target of the second (last) round of reviews: October, 1st, 2024
- Target for sending the accepted manuscripts to the publisher: February 1st, 2025

# Summary

---

- ▷ The organizers have provided the ingredients
- ▷ You are the master chefs who will create the masterpiece
- ▷ Let's get started, and let's have some fun