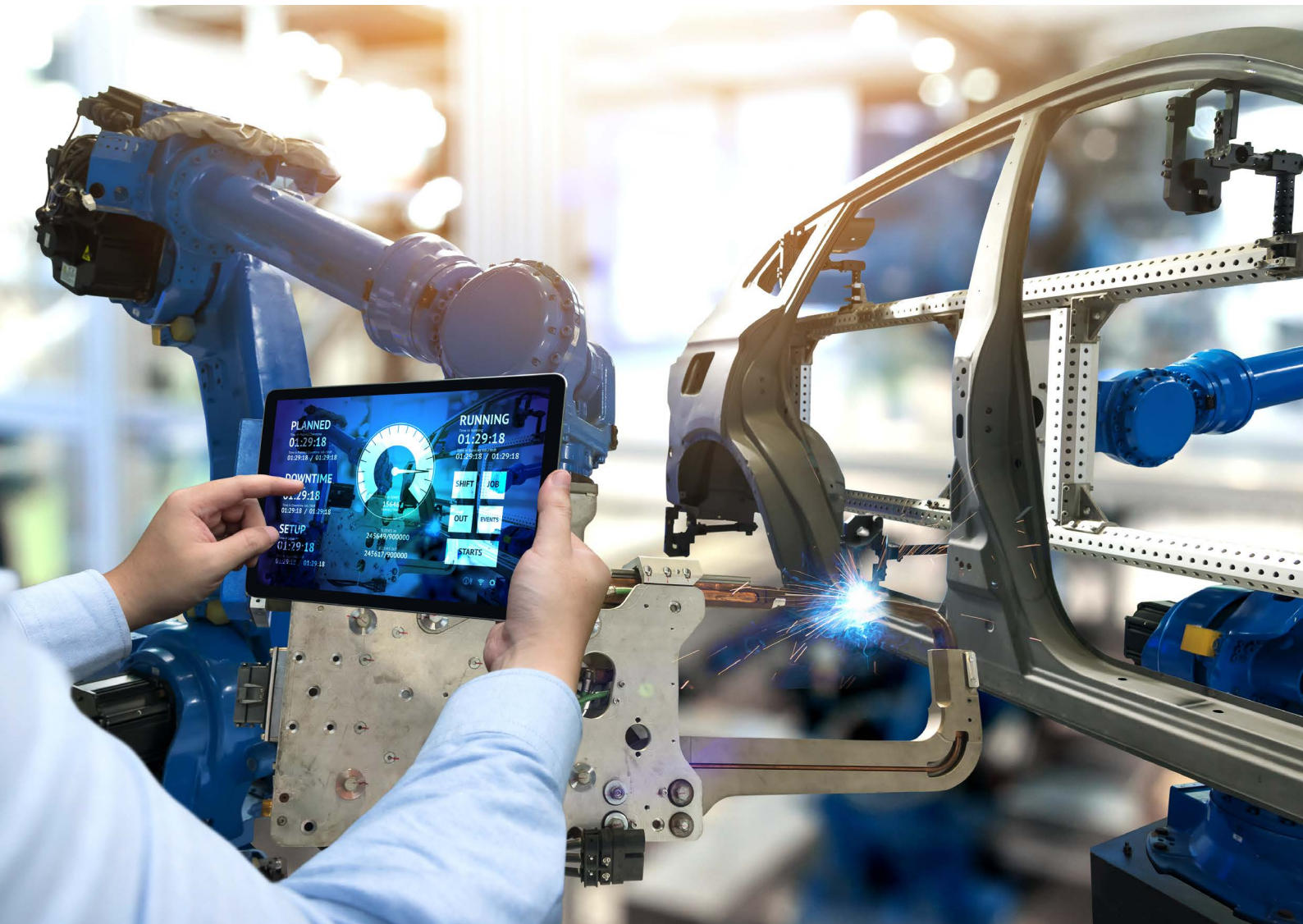# The Next Industrie 4.0 Frontier:
Managing Smart Systems, Disruptive Innovation & Digital Networks

TUM Asia Summer School
29 - 31 August 2018
9.00 AM - 5.00 PM

Organised by:

In Corporation With:

Collaborative Research Center
CRC / SFB 768

TUM Asia

TUM

BEYOND THE HYPE: WHAT IS NEXT FOR INDUSTRIE 4.0?

Since its introduction, Industrie 4.0 (the 4th Industrial Revolution) has been at the top of the agenda across many industry conferences, magazines and reports. The hype has created massive awareness of the topic within many companies and the public. Leveraging on the principles of Industrie 4.0 and its enabling technologies to automate, integrate and optimize manufacturing processes – companies can now achieve shortened cycle times, improved product quality, and implemented efficiency across their operations, while reaping the benefits of manufacturing highly customized products on a global scale.

In an advanced manufacturing environment where modern technologies such as the Internet of Things (IoT), the Industrial Internet of Things (IIoT), automation, cloud computing, Big Data processing, and highly integrated communication capabilities in an advanced manufacturing environment work together – cybersecurity and the social-technical impacts it brings about are aspects that cannot be ignored as well.

This 3-Day Summer School Programme will comprise of a series of lectures, case studies and discussions conducted and facilitated by 3 leading departments in the "Industrie 4.0" domain from the Technical University of Munich (TUM). The Summer School is conducted in collaboration with the Collaborative Research Center CRC / SFB 768 Committee at TUM.

PROGRAMME OVERVIEW

Through this Summer School Programme, participants will be able to strengthen their fundamental knowledge and concepts in Industrie 4.0, gain an in-depth understanding of how to manage smart data, smart systems and its enabling technologies, explore aspects of disruptive innovation and learn how to adopt cybersecurity measures when handling projects.

The Programme will also address a broad spectrum of Industrie 4.0 socio-technical frameworks and explore inter-disciplinary and inter-organisational perspectives. Participants will learn how these concepts can be applied across various industry verticals and how this knowledge can be integrated at their own workplace.

PROGRAMME OBJECTIVE

- Strengthen key knowledge and insights relevant to Industrie 4.0 among senior management of local industries.
- Encourage local industries to take the next step towards digitization and optimization of their manufacturing processes and implement network security measures.
- Motivate professionals to adopt agile project management and risk management approaches for digital networks.
- Equip professionals with Industrie 4.0 socio-technical framework knowledge from both inter-disciplinary and inter-organisational perspectives.

WHO SHOULD ATTEND

- Engineers, Professionals, Managers and Executives (PMEs)
- Middle – Senior Management Decision Makers

PROGRAMME FEES

Individual Sign-Up:
$1,200 (SMEs) / $1,500 (Non-SMEs)

Group Sign-Up (3 and above):
$900 (SMEs) / $1,200 (Non-SMEs)

Single Day Passes are available at $550 (both SMEs and Non-SMEs)

PROGRAMME DETAILS

Date: 29 – 31 August 2018
Time: 9:00AM – 5:00PM
(Lunch & Refreshments are included)

Venue: SIT@SP Building
Level 5, 510 Dover Road
Singapore 139660

SPEAKERS

Prof. Dr. Sabine Maasen

Director of the Munich Center for
Technology in Society (MCTS)
Chair of Friedrich Schiedel Endowed Chair
in the Sociology of Science
Department of TUM School of Governance

Technical University of Munich

Dr. Uli Meyer

Research Group Leader
Munich Center for Technology in Society
(MCTS)

Technical University of Munich

Prof. Dr.-Ing. Birgit Vogel-Heuser

Head of Chair and Director of Institute Munich
Center for Technology in Society (MCTS)
Chair of Automation and Information Systems
Department of Mechanical Engineering

Technical University of Munich

MODULE SYNOPSIS

Industrie 4.0 Socio-Technical Framework I & II: Societal Impacts of Industrie 4.0

Industrie 4.0 is expected to bring disruptive innovation. But what exactly are the implications of that? This module will cover the larger societal implications of this kind of innovation. It will tackle questions like: How will society change? How can a society profit from this and what are the possible risks and dangers? In particular – students will learn what engineers can do to promote the first and prevent the latter.

Industrie 4.0: An Interdisciplinary Perspective

Adapting a company to Industrie 4.0 is challenging on a technical level. However, it also poses organizational challenges. New professions are included in the company, power relations change, and new skills are required. Work and tasks become even more heterogeneous and interdisciplinary than before. Students will learn how to analyse and manage interdisciplinary and organizational settings. They will be provided with different tools, which allow them to handle organizational aspects of Industrie 4.0.

Industrie 4.0: An Inter-Organisational Perspective

A large part of a company's environment consists of other companies. These inter-organizational relations a company has change significantly once Industrie 4.0 technologies and practices are introduced. In this module, students will learn how to analyse the inter-organizational network among companies, how it may change with

Comparison of Industry 4.0, IoT, Smart Factory, Smart Data, Smart Systems & Disruptive Innovation, Enabling Technologies I & II, Case Studies & Successful Demonstrators: Applying Enabling Technologies, Smart Data Enabled Learning During Operation, Security and Human in the Loop

Engineering concepts of Industrie 4.0, human machine interaction systems and intervention of smart data approaches will be discussed in these modules. These subjects will equip students with the skills to judge and evaluate what an Industrie 4.0 system is, its components, capabilities and the necessity of the underlying models and technologies like agents and data analytics. After the module, students will be able to identify beneficial use cases for their companies and the necessary prerequisites. Students will also learn to model the knowledge of an Industrie 4.0 system as a prerequisite for increased reliability and overall equipment effectiveness.

Dr Manuel Wiesche

Chair of Information Systems
Department of Informatics

Technical University of Munich

Human-centered Innovation & Design Thinking

In today's hypercompetitive markets, companies that fulfill customer needs in the fastest and best way are successful. Therefore, companies need to focus on human-centered innovation. Design Thinking is one framework that helps organizations to develop new ideas that are relevant for their customers. In this module, students will gain an understanding why focusing on customers' needs is crucial and what implications that has for innovation processes. Students will get to know Design Thinking as a framework and will apply different Design Thinking methods in a hands-on way in small teams. For example, students will try out methods for gaining user insights and developing low-resolution prototypes.

Managing Digital Innovation Projects & Agile Project Management

Once an innovative idea for a digital product or service is on the table, organizations need to manage the innovation project to bring the idea to life. Due to the fast-moving environment, digital innovation projects face a high degree of uncertainty such as changing customer needs or the emergence of new technologies. Therefore, digital innovation projects need to be managed in an agile way. In this module, students will gain knowledge about the challenges of digital innovation projects and how these challenges can be addressed by agile project management. Students will get to know the agile principles and the SCRUM framework, which represents one way to implement agile principles.

Fundamentals in IT Security & Risk Management in "Industrie 4.0"

Many companies today consider information or IT security as a central element of their IT strategy. Data breaches as experienced by Sony in 2011, Yahoo in 2013, or Equifax in 2017 illustrate that hackers are a real and serious threat for companies. Therefore, companies need to implement strategies how they can improve IT security. In addition, they need to be able to assess and manage the diverse risks in the context of IT management – from internal data losses or leaks to external cyber-attacks. In the context of "Industrie 4.0", IT security and risk management gains further relevance because production equipment and other critical infrastructure is exposed. In this module, students will gain knowledge about the basics and objectives of information security. They will get familiar with risks within information management and will be able to outline and apply a risk management process. Finally, students will discuss why IT security and risk management is crucial in the context of "Industrie 4.0" and what assumptions need to be reconsidered in the "Industrie 4.0".

Case Studies: Managing Industrie 4.0 & IT Security

In this module, students will work on a case study to apply their knowledge on IT security and risk management. Students will work in small teams on a real-world case and develop strategies how the IT security risks can be mediated. The teams will present their findings in the group and discuss their learnings.