Smart Manufacturing I (software-centric)

Why is everyone talking about scheduling their fabs?

J. R. Behnke
General Manager Final Phase Systems
Inficon, Austin, TX, United States

Abstract

The Industry 4.0/Smart Manufacturing revolution is underway and already driving changes throughout the Semi industry and world. The establishment of a comprehensive Digital Twin of a factory is key to delivering any I4.0/Smart solution. It is significantly more difficult to create a Digital Twin in Semi than any other industry for several reasons which will be reviewed. Fabs are willing to invest in creating a Digital Twin because it enables new capabilities, many of which were not comprehended even a few years ago.

Among the new I4.0/Smart solutions, full Fab/Factory Scheduling is the leading application as it typically provides the fastest and greatest ROI. We will review the data and factory requirements, deliverables and expected benefits from such a system including case studies. We will conclude with an overview of future Scheduler enhancements including the integration with tool centric solutions like APC,FDC, eOCAP, etc..

Biography
John R Behnke
GM Final Phase Systems
An INFICON Product Line

Austin, TX | email: john.behnke@inficon.com | linkedin.com/in/johnbehnke

Mr. Behnke has 35 years of semiconductor industry experience including: logic and memory manufacturing, technology/product development and fab operational excellence. As the GM of Final Phase Systems an INFICON Product Line, John leads a team that develop and deploy SMART software solutions that enable fabs to improve their manufacturing efficiency. FPS's suite of software solutions are built upon a common Datawarehouse which enables advanced Fab Scheduling and optimized WIP movement as well as other related capabilities. He is also a Co-Chair of the Semi North America Smart Manufacturing Special Interest Group.

Prior to FPS John served as the CEO and President of Novati Technologies, the SVP and GM of the Semiconductor Group of Intermolecular, the CVP for Front End Manufacturing, Process R&D and Technology Transfers at Spansion and the Director of AMD's Fab 25's Engineering and Operations groups where he was a founding member of AMD's Automated Precision Manufacturing (APM) initiative which led the Semiconductor industry's development and use of APC and other advanced factory systems. He also led the successful conversion of Fab 25 from Logic to Flash memory which was enabled through the virtual automation of the fab.

Mr. Behnke earned a B.S. degree in Mechanical Engineering with an Industrial Engineering Minor from Marquette University. Mr. Behnke holds five U.S. patents.

Machine to Machine communication (M2M) and SMT application "SEMI SMT-ELS

F. Ohbuchi
Siemens, Tokio, Japan

Abstract
Introduce fundamental for Machine to Machine(M2M) interface and extension for application.
Development for SMT assemble line application based on A1 standard for M2M.
Enhance benefit of A1 to actual application also prepare legacy possible to running.

Biography
Fumiyasu OHBUCHI. Work in SMT business over 20 years. Currently working at SIEMENS in Japan for technical support.
Participate SEMI PV comity in past working for development A1 protocol. PV comity transfer to AT comity.
Now Co-chair of AT comity.

5G for industrial Applications

K. Loidl
Fraunhofer-Institut für Integrierte Schaltungen IIS,
Nürnberg, Germany

Fraunhofer
IIS

Abstract

Still not available, it will follow

Biography

Karin Loidl has been with Fraunhofer IIS since 2004 and is an experienced, multidisciplinary engineer whose constant goal is to successfully bridge the gap between ideas, research, development, and implementation. Since Release 15, she has been actively involved in the standardization of 5G and, starting in 2017, has acted as the Fraunhofer IIS SA1 delegate within 3GPP.

Karin's focus within 5G lies on features enabling verticals to optimize the use of 5G for their specific applications. Her comprehensive knowledge of wireless communication solutions, current and upcoming, as well as radio-based positioning technologies, is founded on nearly 25 years of experience in creating and implementing such solutions and the necessary technologies. She graduated with a degree in telecommunication engineering from Ulm University and as an industrial engineer in international economic relation from Nuertingen-Geislingen University as well. From 1996, she worked for PHILIPS before joining Fraunhofer IIS. Apart from 3GPP SA1, she is also active in 5G ACIA, NGMN, VDMA and is a member of the Advisory Board of Global5G

Democratizing AI to accelerate the journey towards smart manufacturing

I. Kobusch
Industry Consultant, IBM Global Electronics
Center of Competence
Ibm Services, Frankfurt, Germany

Abstract

Semiconductor manufacturing has been at the forefront of implementing aspects of smart manufacturing since the early 2000s. Automated material handling and analytics have enabled 300mm fab to reach the highest level of automation among almost all manufacturing industries. Artificial Intelligence (A.I.) holds the promise of driving the next level of smart manufacturing. This talk will cover how to accelerate the application of AI and advanced analytics in semiconductor manufacturing by combining semiconductor domain specific templates and solution patterns utilizing advanced AI & Machine Learning algorithms via hybrid multi cloud delivery model.

Biography

Ingo Kobusch is member of IBM's Global Electronics Center of Competence. He has over 20 years of experience in semiconductor manufacturing and electronics manufacturing and operations. He combines deep industry knowledge with first-hand experience in designing and implementing manufacturing control and optimization systems and processes. Recently, his work has focused on digital transformation, advanced analytics & AI, Industry 4.0 and cognitive manufacturing.

Long way to visibility - IoT as enabler for full transparency along the supply chain

F. Kemmerling
DBschenker, Niederrad, Germany

DB SCHENKER

Abstract
IoT offers promising technical solutions to obtain full and real-time visibility over the supply chain. But the large number of participants in the supply chain, distributed ownership of devices and numerous used technology make it a real challenge to get seamless visibility on a transport. Only few involved can succeed in getting an overview and one of them is the forwarder orchestrating the transport. Key success factor is beside deep process knowledge a flexible IoT platform architecture and a good reach to all parties

Biography
Working more than 10 years in logistics industry with an operational background, focused on digitizing logistics processes. After stations as CIO of Flash Europe, focused on expedited transports and launching a digital startup, he joined DB Schenker 2 years ago, focused on new, customer facing digital initiatives. As Head of IoT he takes care on all IoT projects at DB Schenker and visibility initiatives

Cyber-Physical Human-in-the-Loop Systems for manufacturing: exploring the border between learning and control

G. Russo
Lecturer in Cyber-Physical Systems
University College Dublin, School of Electrical and
Electronic Engineering, Dublin, Ireland

Abstract
Complex manufacturing systems can be modeled as Cyber-Physical Systems (CPSs). Essentially, a CPS is a system controlled via a closed-loop computer-based algorithm and tightly integrated with the communication infrastructure and the behavior of its users. In a manufacturing scenario, it is of particular interest to study CPSs that have humans in their loop. In this context, the talk we will present some recent results related to the design of the control system for such Cyber-Physical, human-in-the-loop, systems. In particular, we will start with introducing our main set-up and context for the research. Then, we will present a set of new results for controlling systems directly from data. From the conceptual viewpoint, the results will allow to learn a control policy from demonstrations and the idea deploy our algorithms in a manufacturing environment, where the plant is not programmed to execute a task but it rather learns how to execute it from *success stories*

Biography
Giovanni Russo is a Lecturer in Cyber-Physical Systems at University College Dublin (UCD). Dr. Russo received his Ph.D. degree from the University of Naples Federico II in 2010. The focus of the work was on the stability of nonlinear dynamical systems with applications to networked control and systems biology. In 2010, Dr. Russo joined Ansaldo STS as a System Engineer and, from 2012 to 2015, he was the Lead System Engineer and Integrator of the Honolulu Rail Transit Project (HRTP) – the first mass transit driverless railway system of the United States. From 2015 to 2018, after having completed the HRTP system-level design, Dr. Russo has been with IBM Research Ireland as a Research Staff Member in Optimization, Control and Decision Science. In September 2018, Dr. Russo joined UCD and current research interests include Cyber-Physical Systems, nonlinear dynamics, stochastic systems and networked control systems. Dr. Russo is currently a member of the Board of Editors of IEEE Transactions on Circuits and Systems I: regular papers and of the IEEE Transactions on Control of Network Systems. Dr. Russo is also a funded investigator of the Science Foundation Ireland Research Centres I-Form (Advanced Manufacturing Irish Research Centre) and LERO (Irish Software Research Centre).