

# MSUG

2019 Annual Conference

Wednesday October 16





# Conference Sponsor Keynote



## ***INTRODUCTION TO SIMULATION WITH FLEXSIM***

### **Speaker**

**President - FlexSim Software Products, Inc.**



#### **Bio**

**Bill Nordgren** is President/CEO of FlexSim Software Products. He was a co-founder of ProModel Corporation in 1988 and was Vice President until 1992. In 1993 Bill founded F&H Simulations, Inc. (now FlexSim Software Products Inc.) and introduced Taylor II, Taylor ED, and FlexSim into the market.

Bill is an adjunct professor in Brigham Young University's College of Engineering and has authored several papers dealing with simulation project management and queuing theory. He is also a co-author of "Applied Simulation: Modeling and analysis using FlexSim". In 2018, Bill was recognized with the Albert Nelson Marquis Lifetime

Achievement Award for his accomplishments in the advancement of simulation technology. Bill received a Bachelor of Science in Manufacturing Engineering Technology, and a Master of Science in CIM (Computer Integrated Manufacturing) from Brigham Young University. In his current position with FSP, Mr. Nordgren uses his expertise in simulation software and process improvement to expand his business into various channels around the world. Additionally, throughout his career, Mr. Nordgren has contributed his expertise to the industry as a developer of polar coordinate mills and as a co-author of the software textbook, "Applied Simulation: Modeling and Analysis Using FlexSim." He also developed the Express It 3D presentation software for Windows operating system.



# Speakers

## 2019 Theme: Creating and Selling the Value of Simulation



### *Using Throughout Accounting to Demonstrate the Value of Simulation*

**Kevin Kohls**  
*President, Kohls Consulting*



#### **Bio**

**Kevin Kohls** has held many improvement positions, from Director of Throughput Analysis and Simulation, Lean Director, Red X Champion, as well as Director of Consulting for several firms. He has won the prestigious INFORM's Franz Edelman award, the Boss Kettering Award for Innovation, and the Chairman's Honors award while working for General Motors. His work is featured as a case study in the 20th anniversary edition of *The Goal* by Eli Goldratt.

His efforts to improve GM production systems, external suppliers, and designing profitable manufacturing systems has accounted for \$2 billion in bottom line results. His work in automated data collection, bottleneck analysis, the Throughput

Improvement Process, and the simulation of new facilities has become "standard work" in GM. The simulation methods he championed at GM reduced the start up time for new manufacturing systems from 18 months to less than 2 months. His client list includes Johnson & Johnson, the Detroit Medical Center, Magna, Dollar/Thrifty Rental Car, Blue Cross Blue Shield of Michigan, Spirit AeroSystems, AmMed Direct, Piedmont Medical Laboratory, ADP, Northern Engraving, and Belvac. His current area of study is Demand Driven MRP and the relationship between the Toyota Production System and the Theory of Constraints.



**WAYNE STATE**  
UNIVERSITY

## ***Mining Process Knowledge and Creating Value Through Simulation and Machine Learning***

**Alper Murat**  
Associate Professor, Wayne State University

### **Abstract**

In this talk, I will give an overview of a lesser known approach, called “Process Mining”, for the discovery of process knowledge and automated simulation model building. While the process mining approaches have been becoming more sophisticated and increasingly accepted in different industries, there are still gaps in their ability to answer the needs for traditional discrete-event based process simulation projects. I will also review some of the machine learning approaches in addressing the shortcomings of process mining.

### **Bio**

**Alper Murat** received his B.S. in Mechanical Engineering and M.S. in Industrial Engineering degrees both from Bogazici University/Turkey in 1998 and 2000. He completed his Ph.D. degree in Management Science/Operations Research from the Desautels Faculty of Management McGill University/Canada in 2006. Murat is the Chief Technology Officer for Agile Systems and is also an Associate Professor in the ISE Department at Wayne State University. His research expertise is in the design and development of predictive analytics and optimization modeling and simulation techniques with applications to the fields of supply chain management, logistics and transportation, product development, quality, reliability and healthcare. He has successfully lead numerous funded research projects with Ford, General Dynamics, HFHS, US DoT, DHS, General Dynamics, and Ford Motor Company and VA VERC on



various applications of descriptive analytics, predictive analytics, operations research and simulation tools and techniques. He is the author of more than 50 technical publications including conference proceedings and numerous peer-reviewed journal articles that appeared in leading academic journals. He has consulted and developed technology solutions for Dominos, Capgemini, Whirlpool, Steelcase, and General Dynamics. He graduated and mentored more than 10 doctoral students and visiting scholars. Dr. Murat and his students' research is recognized through multiple best paper awards from national and international conferences, journals, and professional societies, including the 2007 UPS SOLA Best Dissertation and 2013 INFORMS Transportation Science and Logistics Society's.



## ***Multiple Facets of Simulation Modeling***

**Ray Poshadlo, Senior Consultant - Digital Manufacturing at Production Modeling Corporation (PMC)**

### **Abstract**

#### **Workstation, Manufacturing Line, and Plant-to-Plant Simulation for Enterprise Optimization**

Discrete-event simulation tools such as Siemens PLM Software's Plant Simulation help you to create digital twins (models) of your facilities... including automotive plants, hospitals, shipyards, packaging, etc. The models simulate the behavior of the actual facility (planned or existing). Like the way what-if games in a spreadsheet let you optimize your finances, the models let you play what-if games to optimize your facilities. Topics include:

- Modeling workstations, lines, and plants
- Flat vs. Hierarchical modeling
- Identify Bottlenecks
- Break Bottlenecks,
- Run automated Experiments (what-if games)
- Use Hierarchical modeling to easily change the focus of optimizations from standalone mode (one line, one plant, etc.) to Enterprise mode (Plant to Plant, etc.)



### **Bio**

**Ray Poshadlo**, expert in Siemens Tecnomatix Plant Simulation, leads PMC's professional services and training programs using Siemens Digital Manufacturing solutions. Poshadlo joined PMC after 6 years as a Digital Manufacturing Consultant to Siemens PLM. He also spent several years building models in Simul8 and Witness. Prior to that, he was a System Analyst and Network supervisor at Ford's Think-Tank. Ray has provided digital manufacturing professional services to clients in automotive, aerospace, consumer goods, and electronics industries. He holds a B.S. in Electrical/Electronic Engineering from Wayne State University and a M.S. in Computer, Information, and Control Engineering from the University of Michigan - Ann Arbor where he conducted ground-breaking research in 3D Solid Modeling.



## ***Change Point Detection Using Process Knowledge for Automated Parameter Estimation in Simulation Models***

**Suleyman Yildirim**  
PhD Student, Wayne State University

### **Abstract**

In most practical applications of discrete-event simulation modeling projects, accurate estimation of the internal process parameters and distributions (i.e., service times) and control policies (queuing rules, resource sharing and resource capacity allocation) is critical for the success of the project. These parameters, distributions and rules change over time and continued use of the simulation models to create value require regular maintenance and reestimation. While most enterprise information systems provide real-time access to data for automated estimation of most of these parameters, the necessary data for some of these parameters and control policies are either not available or not reliably available. In this talk, we describe a machine learning and process knowledge driven automated change point detection to estimate when these parameters and controls change over time. We discuss applications and illustrate through a stylized example.



### **Bio**

**Suleyman Yildirim** is a PhD Candidate and Teaching Assistant in Industrial and System Engineering at Wayne State University. Prior to joining the PhD program, he obtained Master of Science degree in Industrial and Systems Engineering at Georgia Institute of Technology, and Master of Engineering degree in Healthcare Systems Engineering in ISE at Lehigh University. Unifying focus of his research is the discovery of discrete event systems in healthcare using machine learning and artificial intelligence techniques. Currently, his research covers multiple areas including integration of process knowledge into change point detection in healthcare systems, automated discovery of process knowledge using deep learning, and distributed and decomposed simulation strategies.



# VENDOR PRESENTATIONS

## 2019 Theme: Creating and Selling the Value of Simulation



### *Multi-Method Simulation Modeling for More Complex Business Problems*

**David Kirby**  
Regional Director, The AnyLogic Company

#### **Abstract**

Simulation modeling involves creating a digital and dynamic representation of a system or process and conducting experiments to predict performance under a variety of conditions. Multi-Method modeling takes you beyond Discrete Event modeling by incorporating DE with agent based and system dynamic modeling all under one interface.

This session will show how the modeler can solve more complex problems without the work arounds using AnyLogic multi-method simulation modeling. Sharing models in the cloud and how to train your model using AI will also be covered.

#### **Bio**

**David Kirby** Regional Director, The AnyLogic Company, DePaul University

David has been in the B2B software industry for almost 30 years. Most of that time was spent with two major PLM/CAD companies, helping customers through the complexities of Product Lifecycle Management and Plant simulation. With these years of experience he is helping customers from many industries solve complex problems using dynamic simulation software. David has spent most of his adult life living in the Chicago area. Also living on the East coast and Munich, Germany.





**Matt Hobson-Rohrer**  
**Roar Simulation**



**Bio**

**Matthew Hobson-Rohrer** has been in the simulation industry for more than 30 years. He has experience with multiple simulation technologies, and has focussed on simulation applications in material handling and automation. Matt has been a leader in the simulation community as well, chairing the Winter Simulation Conference in 2001, and leading the WSC case studies track in recent years.

Matt enjoys the mountain lifestyle of Utah, mountain biking, hiking, and skiing with his family.





## ***Factory of Future: Delivering value today***

**Michael Robinaugh**

**Senior Director, Sales DELMIA WW Value Solutions Channel**

### **Abstract**

The Industry Renaissance is creating new operational challenges. How do we address those challenges? Is the answer the Factory of the Future that everyone is talking about? If yes, how can one really bring it all together. This presentation will show you how the Factory of the Future is:

- The Virtual World Extending and Improving the Real World
- Enhancing the Virtual World with Real Operational Experiences
- Capturing Knowledge and Know-How
- Empowering Collaboration and Decision Support.

### **Bio**



As Senior Director of DELMIA VS Channel Sales, Michael is responsible for DELMIA brand sales through Dassault Systemes' worldwide network of Business Partners. His global team provides sales and technical support in all aspects of DELMIA's portfolio.

Michael joined Dassault Systemes in 2010 after 26 years with IBM. At IBM he had a wide range of positions including Global Sales Manager for DELMIA products, Americas Marketing Manager for the PLM Sales Division, Global Industrial Equipment Industry Marketing Manager, and

PLM Salesman.

Prior to his work in sales and marketing Michael provided technical support to manufacturing customers as a Project Manager, Systems Engineer and Systems Engineering Manager. This included implementation support for multiple CAD and PDM systems at small to large manufacturing companies.

Michael received his Bachelor of Science degree in engineering from Michigan State University. He has completed extensive technical and management training during his career at IBM and Dassault Systemes.



## ***Increasing Simulation Value through Decision Trade-Offs of Coupled Analyses***

**Daniel Schmidt**  
Senior Application Engineer

### **Abstract**

This presentation hopes to detail a way forward for coupled analysis of decision trade-offs in manufacturing processes and operational simulations. Mathematically, when problems are solved serially, one at a time, the potential optimum is reduced. However, you can solve coupled problems simultaneously to achieve better solutions. Within this presentation, lessons will be drawn from the development of design simulation to predict the future of manufacturing simulation.



### **Bio**

**Daniel** is a Senior Application Engineer for ESTECO North America. He received his bachelor's in aerospace engineering from the University of Michigan. His technical interests include genetic algorithms and systems engineering. He would like to see every optimization applied to just about anything and everything.



**Dave Sly**  
**President - Proplanner**



**Bio**

**Dave Sly**, President and Founder, is a registered professional engineer with a bachelors, masters and PhD degree in Industrial Engineering. Dave understands the issues facing the factory planner. Dave's expertise in software for manufacturing is reflected in his more than 40 papers and over 100 seminar presentations on the subject. Dave, who also holds an MBA, knows first-hand the challenges of growing a business in this space. He started, managed for 15 years, and then sold Cimtechnologies Corporation, which produced and marketed factory planning software now owned by Siemens. More than \$30 million worth of Dave's products were sold to such technology-savvy manufacturers as Ford, GM, Chrysler, and Toyota. In addition, Dave has served as the VP of Factory products for EAI, and the director of the e-factory business unit of EDS. He is also a part-time faculty member within the Department of Industrial and Manufacturing Systems Engineering, as well as the Department of Logistics and Management Information Systems at Iowa State University.



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# SIMUL8

**Tom Stephenson**  
**Head of Customer Success**



**Bio**

**Tom Stephenson** has managed large simulation projects for healthcare organizations worldwide. He has built simulations in clinical operations, disease management, service redesign, health economics, and market access for pharmaceutical companies.



# TATA TECHNOLOGIES

## ***WHY WOULD YOU CARE ABOUT PLM-INTEGRATED SIMULATION***

**Kevin Power**  
**Business Development Manager**



### **Bio**

**Kevin** has worked as a solution architect, account executive and electrical engineer with Tata Technologies over the last fifteen years. During this time, he was involved with the implementation of various CATIA v5 deployments for customers in the automotive and aerospace industries. He has taught CATIA and PLM topics to a wide range of students and authored many methodologies and best practices for clients. Kevin currently manages the business development team.



# xcelgo

Virtual Automation Technologies

**Bent Aksel Jørgensen**  
**CEO**



**Bio**



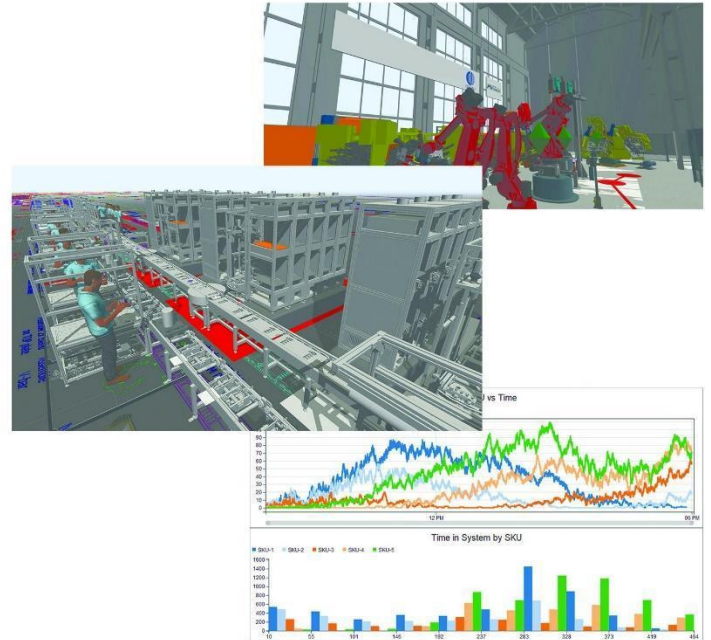
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## 3D simulation modeling software

A modern problem solving tool to help manufacturing, material handling, logistics, and supply chain investigate and improve their systems

- ✓ **Stunning 3D visuals and animation**, essential for communicating and understanding ideas
- ✓ **Personalized support & active development** based on customer feedback
- ✓ **Dashboards with a variety of charts and graphs**, quickly displaying the data you need
- ✓ **Designed specifically for maximum flexibility**, so FlexSim can be customized for any project



[www.flexsim.com](http://www.flexsim.com)



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# Vendors

(in alphabetical order by company name)



Production Modeling Corporation (PMC) has been providing Industrial Engineering (IE) services worldwide for over 30 years. Our services range from New Manufacturing System Program Management to Digital Manufacturing applications as well as providing technical resources to support new and existing Manufacturing Processes. PMC has resources skilled in Discrete Event Simulation as well as a host of other IE and Material Handling Engineering (MHE) work: Time-study, CAD, 3D Scanning, Lean Systems, Material Handling Equipment Design, etc. PMC also provides a host of software and training in simulation, CAD, IE, and MHE areas.

For more information contact:  
**Production Modeling Corporation**

**Melissa Buhalis**  
15726 Michigan Avenue  
Dearborn, MI 48126  
313-441-4460 Ext 1011  
[mbuhalis@pmcorp.com](mailto:mbuhalis@pmcorp.com)  
[www.pmcorp.com](http://www.pmcorp.com)





## SIMUL8 at MSUG

**SIMUL8**  
CORPORATION

Powerful, intuitive simulation software that anyone can use to get results fast. Improve processes, increase efficiency and reduce costs.

### From Cars to Calls - Expanding the Limits of Simulation

*Sander Vermeulen*

With the ability to handle any process at any level of complexity SIMUL8 is not just for your assembly line, it's for any process in your organization that needs improved. Come along to our session and hear how one automotive customer used SIMUL8 to improve support desks in their organization. This presentation will highlight what SIMUL8 can bring to any organization handling customer interactions to improve call flow, staff utilization and profitability and it will get you thinking about what else you could be improving with SIMUL8.

#### Drinks Reception in the Evening

We are hosting a drinks reception in the evening following MSUG. Join us to have a few drinks and network with other simulation users. Drop by our booth for more details.

[www.SIMUL8.com](http://www.SIMUL8.com)



Powerful. Flexible. Fast.



# TATA TECHNOLOGIES

 Engineering a *better world.*