

MSUG

2017 Annual Conference

Tuesday October 17





Conference Sponsor Keynote

The Coexistence of a Simulation Model and a Real-Time Planning & Scheduling Tool, on the Desktop and in the Cloud

Renee Thiesing
Senior Applications Engineer



Abstract

Come learn how a simulation model that can be used for facility design or business process optimization can also be used for real-time planning and scheduling. We will discuss how one Simio tool is a dual purpose solution that can be used to address future planning decisions as well as daily, operational decisions. Simio now leverages the cloud computing power of Microsoft Azure to support your most demanding applications. We will show how our Simio Portal Edition can be used for rapid experimentation or to simply share results across your enterprise. Come explore an overview of the new Simio experience and see why we are always "Forward Thinking."

Bio



Renee provides consulting services, technical support and training to Simio's global customer base. Renee has taught Simio to both users who are new to the simulation field and to experts who are ready to create their own custom library objects. She has provided support to simulation projects in the fields of healthcare, logistics, supply chain, manufacturing, oil & gas, food production and aerospace. Renee is also involved with internal product strategy and software testing.

In addition to her modeling and training experience with Simio's simulation and scheduling software, Renee has previous work experience providing consulting and training services on warehouse management software and telecommunications billing software.

Renee received her bachelor's degree in industrial and operations engineering from The University of Michigan and her master's degree in industrial engineering from Auburn University, with a concentration in discrete event simulation. Contact: rthiesing@simio.com



Speakers

Case Study: Order Fulfillment in an E-Commerce Warehouse

Joe Weiss, Ph. D.
Systems Engineer, Raymond Corp.

Abstract

In the material handling industry, equipment manufacturers strive to differentiate their products in the marketplace with features to improve their customers' operational efficiency. Faster travel and lifting speeds, higher acceleration rates, extended operation between battery changes, and optimization features intuitively will improve productivity however it is a challenge to quantify the impact a feature will have in a customer's actual facility. Simulation plays a key role in linking new product features to improvements in performance customers can expect to realize. This presentation goes into detail on a case study where an e-commerce facility is modeled to evaluate the impact a new feature will have on overall order picking rates.

Bio



Joe Weiss is a research engineer at The Raymond Corporation in Greene, NY where he works on warehouse simulation and new product development. He received a B.S. degree in Biological Engineering from Cornell university in 2006 and a Masters in Energy from Cornell in 2007. He worked for Pall Corporation as the lead applications engineer for food and beverage systems in the Western Hemisphere. In 2012 he graduated from Binghamton University with a Ph. D. degree in Industrial and Systems Engineering and went to work for Chobani Greek Yogurt as a senior engineer. In 2013 he joined The Raymond Corporation in his present role. At Raymond, Joe is the liaison for warehouse simulation research projects with Binghamton University where customer facilities are studied and simulated with the goal of process optimization. Joe has simulated facilities of major national and multi-national corporations and has provided recommendations for process improvements. He has presented his simulation work across the country as well as in Sweden and at the Toyota Industries Technology Expo in Takahama, Japan.



Simulation Analyzes Material Handling Requirements for a Major Automotive Supplier

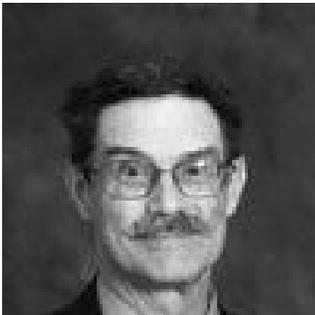
Edward J. Williams, Sr.
Simulation Analyst, PMC

Abstract

Simulation now has a long record of improving operational efficiency and effectiveness in many areas – manufacturing, commercial transportation and logistics, health care, public-sector transport, service industries, and military operations. Historically, simulation’s earliest successes appeared in the manufacturing sector. These successes began with attention to value-added operations (e.g., at machines often entailing high capital investments) and rapidly spread to the non-value-added but very necessary material-handling requirements within factories.

In this presentation, we describe the simulation and consequent analysis of material-handling requirements for a major automotive supplier. Successful material handling operations must satisfy several compelling interests, including safety, timeliness, efficiency, and effective support of the actual manufacturing operations under conditions of tightly constrained financial investment and ongoing financial support. This successful simulation and analysis project helped the client enterprise accommodate needed production increases with reduced headcount and hence minimal or no cost increases, including those entailed by in new equipment and floor space.

Bio



EDWARD J. WILLIAMS holds bachelor's and master's degrees in mathematics (Michigan State University, 1967; University of Wisconsin, 1968). From 1969 to 1971, he did statistical programming and analysis of biomedical data at Walter Reed Army Hospital, Washington, D.C. He joined Ford Motor Company in 1972, where he worked until retirement in December 2001 as a computer software analyst supporting statistical and simulation software. After retirement from Ford, he joined PMC, Dearborn, Michigan, as a senior simulation analyst. Also, since 1980, he has taught classes at the University of Michigan, including both undergraduate and graduate

simulation classes using GPSS/H, SLAM II, SIMAN, ProModel, SIMUL8, Arena®, or Simio®. He is a member of the Institute of Industrial and Systems Engineers [IISE], the Society for Computer Simulation International [SCS], and the Michigan Simulation Users Group [MSUG]. He serves on the editorial board of the International Journal of Industrial Engineering – Applications and Practice. During the last several years, he has given invited plenary addresses on simulation and statistics at conferences in Monterrey, México; Istanbul, Turkey; Genova, Italy; Rīga, Latvia; and Jyväskylä, Finland. He served as a co-editor of Proceedings of the International Workshop on Harbour, Maritime and Multimodal Logistics Modelling & Simulation 2003, a conference held in Rīga, Latvia. Likewise, he served the Summer Computer Simulation Conferences of 2004, 2005, and 2006 as Proceedings co-editor. He was the Simulation Applications track coordinator for the 2011 Winter Simulation Conference and the 2014 Institute of Industrial Engineers annual conference, and was a Manufacturing Track coordinator for the 2015 Winter Simulation Conference. His email addresses are williams@umich.edu or

ewilliams@pmcorp.com.



Tomorrow's Simulation: Persistent, Embedded, Vertical, and Distributed

Ian McGregor
Director, Emulate3D

Abstract

The simulation industry has moved a long way from the early days of numerical analyses created by experts with languages barely distinguishable from the underlying machine code. Graphical interfaces have blossomed to render both model creation and use a much more accessible experience for a wider range of users, and many vertical developments have emerged in response to a demand for more application-specific solutions. These trends are likely to continue, and with the growing availability of the cloud and the emergence of Virtual and Augmented Reality from a promising gaming technology into an industrially useful tool, new opportunities for users are becoming apparent.

But what's really useful and what's just hype? Seeing through the initial excitement of easy promises and determining which technologies offer real advantages now is not always easy.

This presentation will focus on how industrial simulation is likely to develop in the coming years as the concept of the Digital Twin takes shape and becomes more widely adopted within the different phases of automation projects, from initial concept development through implementation, exploitation, ongoing development, and training. What commercially-based justification is there for extending simulation into the cloud, or for offering users the option of viewing or building models in Virtual and Augmented Reality environments? How do these headlining technologies offer real advantages to simulation users?

Bio



Ian McGregor is a co-founder of Emulate3D and has been one of the three Director-owners since the company's creation in 2005. Emulate3D develops a range of engineering software designed to assist with off-line virtual commissioning (Emulate3D Controls Testing), data-driven throughput simulation and analysis (Sim3D), and demonstration, prototyping and layout software, (Demo3D and Layout3D). In 2014 Emulate3D was awarded a Queen's Award for Enterprise in the Innovation category, for which Ian was presented to Her Majesty the Queen Elizabeth II. Prior to creating Emulate3D Ian worked extensively with various simulation products worldwide; living and working as an engineer in the US for four years, Japan for one year,

Singapore for eighteen months, and France for ten years. He has a Bachelor of Science degree in Mechanical, Aeronautical, and Production Engineering, a Diplome d'Ingenieur in Applied Computing, a Master of Science degree in Computer Integrated Manufacturing, and is a Chartered Member of the Institute of Mechanical Engineers.



Vendor Sessions

(in alphabetical order by company name)



Multimethod Simulation & Analytics for the Entire Business Lifecycle

Derek Magilton
Director of Business Development

Abstract

AnyLogic Company produces the standard in multimethod modeling technology which equates to increased efficiency and less risk when tackling complex business challenges. This unmatched flexibility is found in all AnyLogic products allowing users to capture the complexity of virtually any system, at any level of detail, and gain deeper insight into the interdependent processes inside and around an organization.

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Bio



Derek Magilton, Director of Business Development at AnyLogic North America, is a global technical professional, having worked for IBM in Australia and Europe before moving to Chicago to head up Panasonic Factory Solutions Co. of America's technical support and professional services teams. He is now responsible for North American sales at AnyLogic.

At Panasonic, Derek was actively involved in the implementation, support and product planning. This experience combined with over 20 years evangelizing new technologies, position him and AnyLogic perfectly to bring modeling & simulation into the mainstream.



Managing the Level of Animation Graphics

Dan Muller
Global Product Manager

Abstract

In today's simulation environment we often get caught up in the glitz of making simulation model graphics as real as possible. Often we may sacrifice model performance in lieu of model graphics. This presentation will take a look at the challenges of modeling in today's environments through simulation examples. Understanding the modeling objectives and stakeholders is essential in planning how to design the model for the appropriate level of graphics needed to balance performance and visual impact.

Bio



Dan Muller has worked for Applied Materials/Brooks Automation/AutoSimulations since 1992. He is currently the Global Product Manager for the AutoMod Simulation Product. He previously has worked as a Consulting Manager, World-Wide Presales, and as a Senior Simulation Analyst, conducting numerous simulation studies for over ten years in a variety of industries. He currently coordinates the simulation development activities as well as manages the AutoMod world-wide distributor network. Prior to joining Applied Materials, Mr. Muller worked as Senior Simulation Consultant for Systems Modeling Corporation and as Systems Engineer for Litton Integrated Systems. Mr. Muller received a Bachelor of Industrial Engineering from Georgia Tech in 1985 and his Master of Science in Industrial Engineering from The University of Pittsburgh in 1991.



How to Design and Develop AMHS Projects Better and Faster, Communicate Ideas More Effectively and for Less Cost, and Minimize Your CO2 Emissions

Rob Morrow

General Manager of the Americas - Emulate3D

Abstract

Emulate3D broke new ground when it was initially released as the first physics-based industrial modeling system conceived from the start as an emulation system – virtual controls testing for material handling systems – and it continues to develop and innovate in ways that make users' jobs more productive and cost-effective. The emergence of virtual and augmented reality presents opportunities at several levels in the life cycle of the design, production, and use of any automated system, and Emulate3D is again at the forefront of development in this exciting area of technology.

Presenting running models in the virtual environment is just a start; interacting with them through their control systems and training users who may be in a different country are where the true benefits of this fast-developing technology are showing themselves.

This presentation will demonstrate recent advances in Emulate3D Controls Testing and VR/AR that justify the bold assertions in the title, and attendees will have the opportunity to experience it for themselves during the breaks.

Bio



Rob has worked in the automation software industry for over 20 years. Prior to his two years at Emulate3D, he held Account Management, Sales Management and Product Marketing Management positions at Stanley Black & Decker, Applied Materials, Brooks Automation and AutoSimulation/AutoSoft. He enjoys employing the power and flexibility of software solutions in an otherwise hardware-centric material handling industry. He lives in Salt Lake City where he loves anything done in the outdoors.



Advanced Manufacturing & Material Handling Modeling with FlexSim

Bill Nordgren

President/CEO - FlexSim Software Products, Inc.

Abstract

Join us for a demonstration of some of FlexSim's latest features to accurately model complex manufacturing and material handling systems. FlexSim CEO Bill Nordgren will cover our powerful new templates for AGV systems, material consumption and replenishment, and gap optimization in conveyor merges. He'll also showcase our automated pathfinding module, AStar, which was recently updated with collision avoidance, heat maps, and partition control. We'd love to show you why FlexSim is the right choice for manufacturing, materials handling, and warehousing.

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 has authored several papers dealing with simulation project management, queuing theory, and has taught hundreds of classes in the use of simulation software. Bill is a co-author of "Applied Simulation: Modeling and analysis using FlexSim". He is listed in Marquis Who's Who in America 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.



IT'S A GAME CHANGER... Eradicate start up delays, using simulation and Virtual Commissioning

Curtis Desaele

Director of Technology - Geometric Solutions

Abstract

In today's world of design and manufacturing, three things – product quality, cost, and time to market – determine one's success over the competition. It's a constant challenge to increase the first while decreasing the other two. Using Process Simulate and Virtual Commissioning, you can improve all three.

What is Process Simulate?

Process Simulate is a discrete event simulation tool. It is primarily used for simulating robotic operations on the plant floor. The physics (rotation angles, speed, limitations) of the actual robot are available for all the major brands of robots. Then robots, tools, parts and storage containers are placed in onto the virtual plant floor. The simulation modeler tells the robot what to do (i.e., spot weld these X number of locations, or spray paint this surface with 20-30% overlap between strokes), and Process Simulate simulates the robot's movement to validate it can meet requirements for timing and function.

Events (event based simulation) are programmed in, letting the software know when action can take place. For example, a robot can pick up a part, only after a different robot is completed with welding the part in that location.

Process Simulate will allow you to program your robots ahead of time, and assure reach robot can meet these typical requirements:

1. Reach all locations, and perform its required tasks.
2. Eliminate crash conditions with the robot, the end of arm effector, or the part is it carrying.
3. Meet cycle time requirements.



What is Virtual Commissioning?

Once the robots have been determined to meet requirements 1,2 and 3 above, then virtually commission the Programmable Logic Controllers (PLC's) and other hardware , Human Machine Interface (HMI) Controllers and Safety Light Screens, to assure they will work with the robots – ALL BEFORE start of production.

This can be done with virtual hardware, or physical hardware. The PLC programs are loaded into the virtual or physical hardware to prove out they work as required.

All of this simulation leads to improved production launches, since the logic has been proved out through simulation. Eradicating start up delays, and improving product quality, cost, and time to market.

A brief overview of the tool will be shown, and multiple case studies will be show and the benefits gained by using Process Simulate and Virtual Commissioning.

Bio



Curtis DeSaele has more than 30 years' experience in manufacturing and product and engineering. Since 1984 he has been in the forefront of Digital Simulation, specifically related to virtual prototyping and dimensional quality. Curtis is recognized internationally as an expert in Digital Simulation using 3D Tolerance Analysis Simulation tools. Having worked for companies like EDS, GM, Siemens, UGS, PLM Software, and various engineering service companies, Curtis understands strategic and tactical business implementation of Digital Simulation tools. At these companies, he gained experience as a software programmer, corporate instructor/mentor, and user of multiple 3D Tolerance Analysis Simulation tools.

For the past 12 years, Curtis has worked as a consultant within multiple industries: defense, aerospace, transportation, heavy industry, medicine, agriculture, energy, and consumer products. He has taught/helped clients with quality problems using Digital Simulation and 3D Tolerance Analysis Simulation tools.

In addition to directly using 3D Tolerance Analysis Simulation tools, Curtis has experience using all the major CAD software, all the major PDMs, many different CAE tools, and multiple Digital Simulation software tools for robotic programming, plant planning, human ergonomics. Curtis enjoys the blending new technology, software, and best-in-class processes into new applications or industries, while driving quality and reducing overall costs.



Techniques and Benefits to Integrating Virtual Assembly and Clustered Precedence with Assembly Line Balancing

Dave Sly
President - Proplanner

Abstract

Many organizations still assign tasks (and the parts they consume) to operators and stations on the assembly line using manual techniques within spreadsheets. Often, these studies create errors regarding assembly precedence which can be expensive to address as production startup nears. Historically Assembly Line Balancing applications focused on automatically generating task and station assignment but this delivered questionable alternatives with limited benefits in design cost and time. Recent advances in readily available 3D product assembly models as well as clustered precedence definition user interfaces has enabled new productivities and justifications for assembly line balancing technology. This presentation will focus on the benefits and interfaces which make this new generation of line balancing software highly productive.

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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Simulation, Industry 4.0, and the Digital Enterprise

Noam Ribon

Senior Business Consultant – Siemens PLM Software

Abstract

Industrie 4.0 (or Industry 4.0) is part of many, if not most, industrial conversations. Becoming a Digital Enterprise is considered a necessary path for embarking on that journey towards Industry 4.0. Digitalization is the means (supported by cultural change) for becoming a Digital Enterprise. Simply stated, digitalization is the new way to realize innovation, deliver faster, at a competitive cost, tailored to the individual, all at the ultimate quality. In short, your competitive edge in the market.

The Digital Twin is a central player in Digitalization, enabled by it, and taking full advantage of it. While digital forms of analyzing information are not new, what is rapidly changing is turning to sophisticated computer models that can support a multi-faceted approach. With those characteristics, these models can claim the designation of Digital Twins. In Production, these Digital Twins can serve not only for making decisions prior to committing capital and resources, but also for predicting changes that allow for quick and timely adaptations, maintaining and gaining that competitive edge in the market.

Simulation has been digital for quite some time now, and is regularly used in Production. This makes it a good candidate for the Production Digital Twin. To earn that title though, simulation models must closely resemble their Production Physical Twin. This session will discuss the Production Digital Twin and why Simulation is an integral part of Digitalization, and Industry 4.0.

Bio



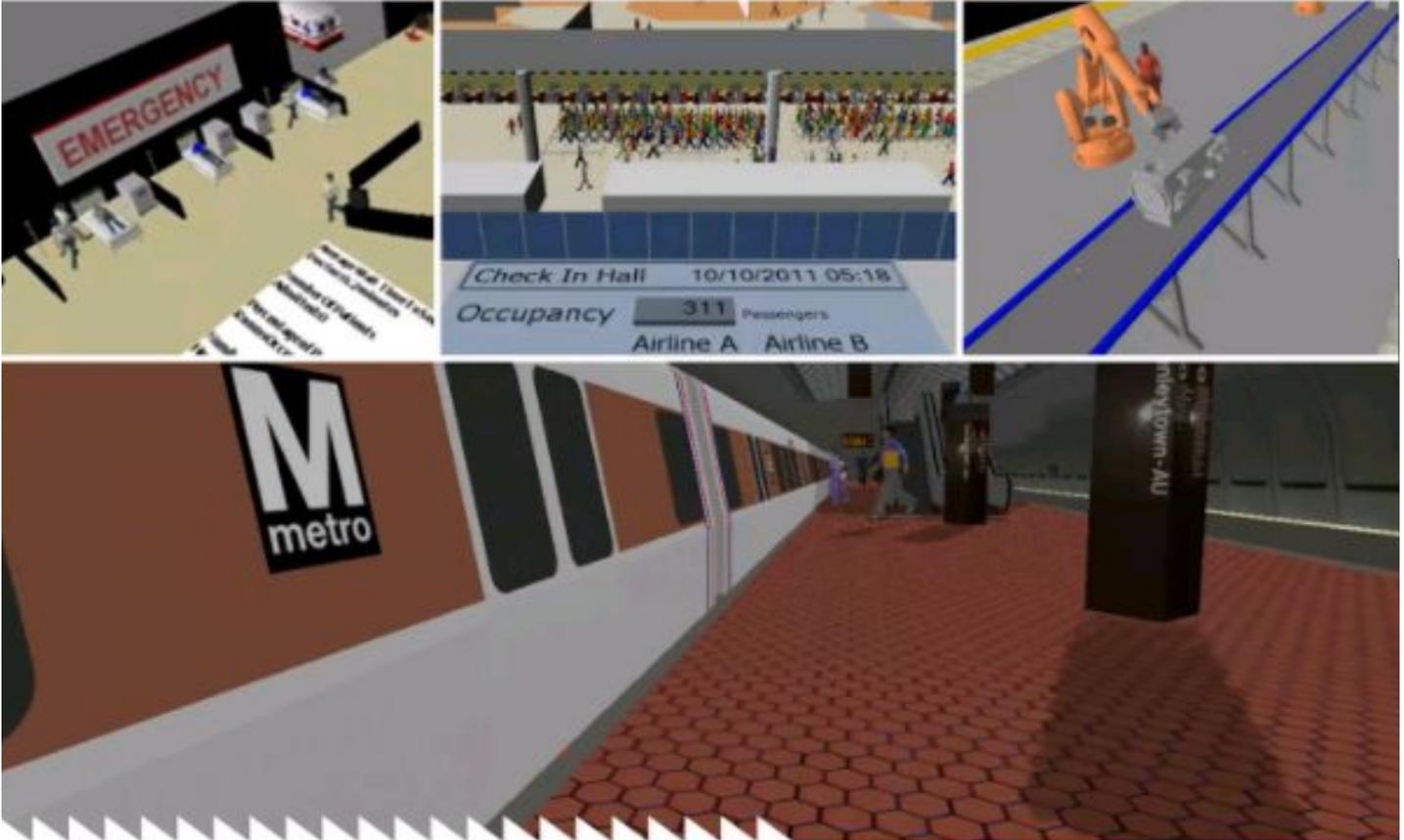
Noam Ribon is a Senior Business Consultant at Siemens PLM Software with a specialization in Digitalization of Manufacturing, program, project and IT management.

Noam has over 30 years of Computer Aided Design (CAD), Product Lifecycle Management (PLM), Digital Manufacturing and Digitalization (Industry 4.0) software experience across various industries.

Noam holds a B.Sc. Mechanical Engineering from the Technion Institute of Technology, Israel and a Master of Business Administration from the University of Phoenix.



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(in alphabetical order by company name)



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For more information please contact:

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EMULATE3D

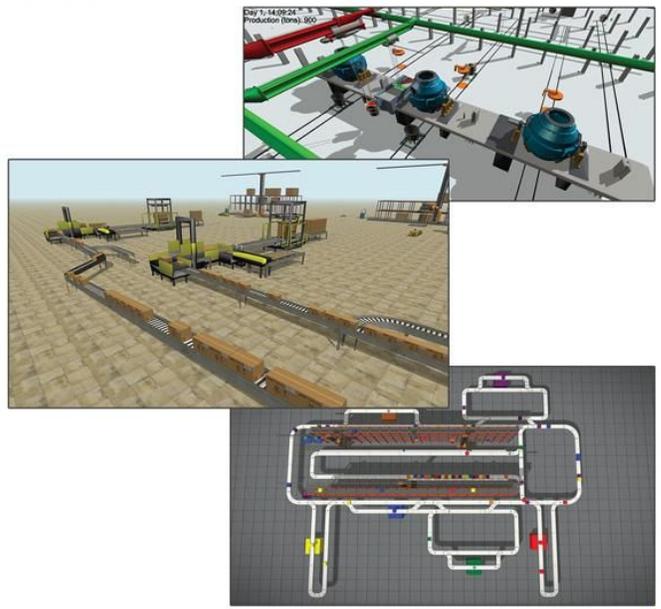
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Forward Vision

For the past 20 years Forward Vision has been a consultant and value added reseller in the discrete event and robotic simulation marketplace. Our team is ready to assist you with everything from simulation training to complete project consulting. You can find us on the web at www.forwardvision.com.

For more information contact:

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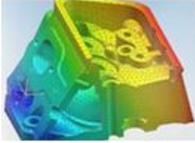
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For more information contact:

Production Modeling

Corporation

Melissa Buhalis

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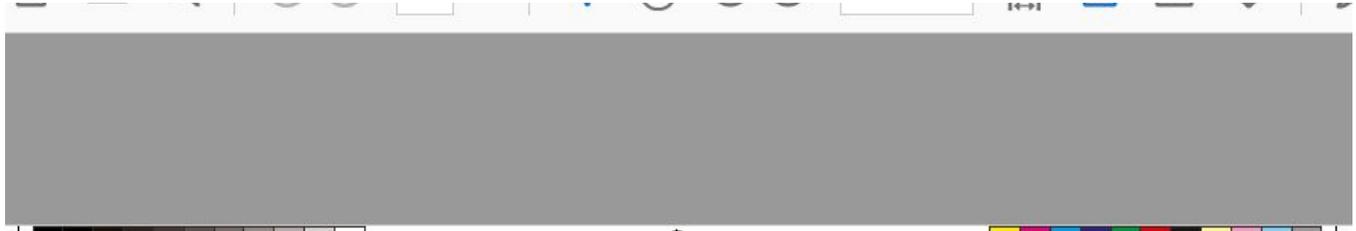
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Sander Vermeulen

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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.

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