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AsiaSim 2021

Asia Simulation Conference 2021

General Chair:
Byeong-Yun Chang
Ajou University, Korea

December 8 - 11, 2021
Virtual Conference, Korea

Information

Registration Desk

Send the completed registration form to asiasim.korea@gmail.com and receive the link to enter the venue by email.

Dec. 8, Wednesday 10:00 – 12:00

Self-Guided Venue Tour

Experience the conference venue in advance.

Dec. 8, Wednesday 13:30 – 14:00

Opening Ceremony (Keynote Room)

Welcome Address

Dec. 9th, Thursday 10:00 - 10:30

Keynote Speech (Keynote Room)

Dec. 9th, Thursday 11:10 - 11:50

David Goldsman (Georgia Institute of Technology, USA)

Dec. 9th, Thursday 15:10 - 15:50

Byunghee Kim (VMS Solutions Co. Ltd., Korea)

Dec. 10th, Friday 15:10 - 15:50

Lin Zhang (Beihang University, China)

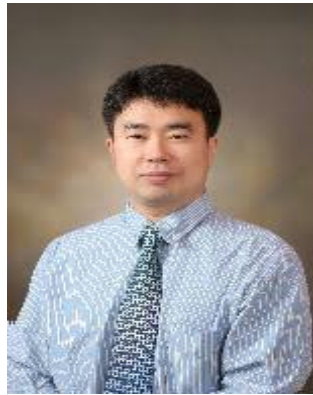
Dec. 10th, Friday 11:10 - 11:50

Satoshi Tanaka (Ritsumeikan University, Japan)

Closing Remarks (Keynote Room)

Dec. 10th, Friday 17:30

AsiaSim 2021 General Chair's Message



Dear KSC's and AsiaSim's friends

Thank you for joining AsiaSim Conference 2021.

On behalf of the AsiaSim2021 Organizing Committee, I sincerely welcome you to participate in the AsiaSim Conference 2021 under adverse conditions due to the Covid-19.

Asia Simulation Conference is an annual conference organized by responsible Asia Sim Federation member society in cooperation with Asia Simulation Federation. Since 2001, Asia Simulation Conference has provided a forum for scientists, academicians, and professionals from around the Asia to present their latest and exciting research findings in various fields of modeling, simulation, and their applications. This year, unfortunately, due to Covid-19, we are holding AsiaSim2021 as a virtual conference.

All papers have been reviewed by the International Program Committee formed by the ASIASIM Council members, and other experts active in the field to ensure high quality and relevance to the conference.

This strict screening process produces the very high-quality papers in the fields of modeling and simulation methodology, virtual reality, aerospace, e-business, general and engineering applications, manufacturing, medical, military, networks, transportation and traffic simulation, and so on.

Because AsiaSim 2021's success is mainly the result of many individual contributions, I would like to thank all authors, their reviewers, and program committee members as well as session chairs. My special thanks go to the

Organizing Committee Chair Jinsoo Park, International Program Committee Chair Changbeom Choi, and all members of the Organizing Committee for their excellent job in a very short period of time. A special thank is also to Professor Lee Kyu Min for allowing "Special Issues of International Journal of Industrial Engineering". Thanks are also to our sponsors for their financial, technical and publication support. I do not want to omit special thanks to keynote speakers, Byunghee Kim, David Goldsman, Lin Zhang, Satoshi Tanaka.

Hope you have a great time at AsiaSim 2021.

Byeong-Yun Chang, Ph.D.,

General Chair, Asia Simulation Conference 2021

President of Korea Society for Simulation

Keynote Address

1. Thursday, December 9, KST 10:40am, Keynote Room

David Goldman, Georgia Institute of Technology, USA



"New Horizons for Simulation: Where Do We Go from Here?"

ABSTRACT: Simulation has evolved over the years into one of the most pre-eminent tools in the research and applications communities. We present a synopsis of the history of simulation and outline some of the numerous ways that it has come to be employed to solve many of the most-important problems we face in today's world. The main content of the talk will center on what may be ahead for the field, in terms of evolving areas of interest and problem-solving functionality. For instance, how can simulation leverage the arrival of massive data gathering and exponentiating computation capabilities to tackle more and more challenging problems? And can simulation peacefully and synergistically coexist with and benefit from developing statistical and machine learning methods? The future is bright for the field of simulation and we are well-positioned to make

tremendous progress going forward.

2. Thursday, December 9, KST 14:40, Keynote Room

Byunghee Kim, VMS Solutions Co. Ltd., Korea



"Digital Twin based Smart Operation Management System for Semiconductor Manufacturing"

ABSTRACT: Despite the global pandemic and resulting economic downturn, the global semiconductor industry remained resilient with revenue growth and is expecting significant growth in 2021 and beyond. Semiconductors such as memory chips are a backbone and a prerequisite for any endeavor in emerging technologies. To increase production efficiency, many semiconductor manufacturers are planning to build multiple factories at a site. For example, SK Hynix plans to build 8 wafer fabs in Yongin, South Korea, and TSMC plans to build 6 wafer fabs in Arizona, USA.

As multiple wafer fabs are operating at a site, more complex and optimized manufacturing operation management

(MOM) are required. MOM needs consideration of not only line management within a fab but also capacity balance between fabs. MOM system usually consists of two-level planning systems (weekly and daily planning) and real-time scheduling systems. Interdependent applications in MOM are running independently and link directly to the real wafer fabs. There has been a continuous demand for off-line simulations to validate new logic enhancements in each system and to analysis performance changes over to evolving manufacturing environments.

As an offline system analysis environment, digital twin (DT) helps visibility, validation, and optimization by means of simulation, optimization, and ML-techniques. The Digital Twin supports iterative and parametric simulations for each application and integrated multi-applications. For example, integrated simulation between upper and lower applications, such as planning systems and fab schedulers, enables analysis of the result from a global perspective.

DT systems can provide decision makers with a virtual simulation environment and provide a variety of alternative results. In addition, DT helps managers operate their wafer fabs smartly and expects to improve production performance.

3. Friday, December 10, KST 10:40am, Keynote Room

Lin Zhang, Beihang University, China



“An integrated modeling and simulation language for M&S based system engineering”

ABSTRACT: The development of complex engineering systems (e.g. manufacturing systems) has to meet the challenges of the collaboration and integration of multi-discipline, multi-agent, multi-phases in the whole lifecycle of the systems. Modeling and Simulation based system engineering (MSBSE), which is an extension of MBSE, plays an important role to shorten the time and lower the cost of the development. Current modeling languages are difficult to describe both the system level features (e.g. requirement, architecture) and physical features of a complex system as well as conducting simulations. The X language is a modeling and simulation language that incorporates SysML, Modelica, DEVS, agents and machine learning, which supports the unified modeling of the whole system and the whole process. It can realize both the multi-domain unified modeling and cross-stage collaborative modeling to build an integrated model supporting MSBSE. The lecture will introduce the basic idea, structure, syntax and semantics of the X language, and the compiler and simulator based on X languages. Several examples are given.

4. Friday, December 10, KST 14:40, Keynote Room

Satoshi Tanaka, Ritsumeikan University, Japan



“Stochastic Noise Reduction for High-Quality Transparent Visualization of 3D Scanned Point Clouds”

ABSTRACT: This talk introduces our recent achievements on high-quality and transparent imaging of the large-scale and complex point clouds acquired by 3D scanning. Our method makes the measurement noise transparent, i.e., invisible in visualization automatically. The method is based on a stochastic algorithm and is suitable for 3D scanned big data. The method enables the high-quality rendering of noisy 3D scanned data that records 3D objects in the real world. The effectiveness and robustness of our method are demonstrated by applying it to various kinds of real 3D scanned data. Theoretical and experimental validations of the method are also discussed.

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AsiaSim 2021 Program

Wednesday, December 8, 2021

Registration

10:00 - 12:00

Send the completed registration form to asiasim.korea@gmail.com and receive the link to enter the venue by email.

The application form can be downloaded from the AsiaSim 2021 website (<http://www.asiasim2021.org>).

Self-Guided Venue Tour

13:30 - 14:00

Preview of the conference venue

[Oral: Pre-recorded video] KST 14:10 ~ 15:50, Dec. 8th

✚ Modeling Methodology (Session Room A)

1. Random Sampling Method with Data Bias

Jihun Jeong Boseung Kwon Seongmin Ryu Bunyod Ibrokhimov, Youngshin Han, Jongsik Lee

2. Modelling of Crowd Dynamics Considering Emergency Signs and Emotions

Jianwei Wang, Gaofeng Zhang, Benzhu Xu, Yusheng Peng, Liping Zheng

3. <IF-THEN-AFTER> Rule Structure for Time Based Expert System

Suk Hoon Shin, Syng Yup Ohn, Sung Do Chi

4. Designing the population synthesis for modelling epidemiology using agent-based simulation

Muhammad Mu'az Imran, Young Kim, Gisun Jung, Tae-Eun Park, Javed Aslam, Aqeela Saleem, Azam Che Idris, Liyanage C. De Silva, Yun Bae Kim

[Oral: Pre-recorded video] KST 16:00 ~ 17:20, Dec. 8th

✚ Cyber and National Security (Session Room B)

1. Backward Elimination based on an ensemble of Concurrent Spare Part demand forecasting spare parts

Jea-Dong Kim, Hongsuk Park

2. Demand Forecasting of Spare Parts via Stacked Generalization: Case Study of K-X Tanks

Jae-Dong Kim, Taehyeong Kim, Young-Seok Kim, Sung Won Han

3. Use of Simulation in Cyber Ranges for Vessel Management Systems

Hae Young Lee, Su Man Nam

Thursday, December 9, 2021

Opening Ceremony

10:00 - 10:30 <Keynote Room>

Welcome Address

Keynote Speech

10:40 - 11:20 < Keynote Room >

New Horizons for Simulation: Where Do We Go from Here?

David Goldman, Georgia Institute of Technology, USA

14:40 - 15:20 <Keynote Room>

Digital Twin based Smart Operation Management System for Semiconductor Manufacturing

Byunghee Kim, VMS Solutions Co. Ltd., Korea

[Oral: Live Stream] KST 13:00 ~ 14:20, Dec. 9th

+ Simulation and Visualization (Session Room D)

Session Chair: Byeong-Yun Chang (Ajou Univeristy, Korea)

1. Application of the Edge Upsampling Network to Soft-Edge Regions in a 3D-Scanned Point Cloud
Weite Li, Kyoko Hasegawa, Liang Li, Akihiro Tsukamoto, Yamaguchi Hiroshi, Fadjar I. Thufail, Brahmantara, Satoshi Tanaka
2. Toward Agent-based In Situ Visualization
Yan WANG, Ren SAKAI, Akira KAGEYAMA
3. A Visual Analytics Method for Time-Series Log Data Using Multiple Dimensionality Reduction
Keijiro Fujita, Naohisa Sakamoto, Takanori Fujiwara, Jorji Nonaka, Toshiyuki Tsukamoto

[Poster: Pre-recorded video] KST 13:00 ~ 14:20, Dec. 9th

✚ Poster Session A(Poster Room A)

1. A study on stochastic epidemic diffusion forecasting model with observation delay and reaction delay
Han Sol Lee, Byeong-Yun Chang
2. Experiments on the battle trend and result of Combat21 model and VBS4
Jonggill Lee, Heenam Lee, Koangsu Lee

[Oral: Live Stream] KST 15:40 ~ 17:20, Dec. 9th

✚ Simulation and Transportation, Logistics (Session Room D)

Session Chair: Hyung Jong Kim (Seoul Women's University, Korea)

1. Comparing the Conversion Effects of Toll Operations for Seoul Tollgate Using Arena
Seung-Min Noh, Seong-Yong Jang
2. A Study on SES-based Information Security Framework for Autonomous Vehicle Controlling Environment
Hyung-Jong KIM, Hwahyeon Park
3. Design of Car Crash Simulator Considering Real-time Coordination of Self-drive Vehicles
Su Man Nam, Chaeyeon Sagong, Jieun Park, Hyewon Park, Minjoo Kim, Yujin Lee, and Hyung-Jong Kim
4. A Spatial-temporal 3D Convolutional Neural Network to Predict the Pedestrian Trajectory
Ruiping Wang, Xiao Song

Friday, December 10, 2021

Keynote Speech

10:40 - 11:20 < Keynote Room >

An integrated modeling and simulation language for M&S based system engineering

Lin Zhang, Beihang University, China

14:40 - 15:20 <Keynote Room>

Stochastic Noise Reduction for High-Quality Transparent Visualization of 3D Scanned Point Clouds

Satoshi Tanaka, Ritsumeikan University, Japan

[Oral: Pre-recorded video] KST 09:00 ~ 10:20, Dec. 10th

✚ Simulation Application (Session Room A)

1. Multi-Objective Pathfinding for Autonomous Robot in Agriculture

Umar Zangina, Aminu Yahaya Zimit, Mohd Saiful Azimi Mahmud, Salinda Buyamin, Mohamad Shukri Zainal Abidin

2. Buy online and pick up in store placement using Fuzzy-AHP

Choon-ki Min, Eun-ju Cha, Byeong-yun Chang

3. HARQ Retransmissions in Shared Spectrum Channel Access Networks

Eunkyung Kim

[Oral: Live Stream] KST 13:00 ~ 14:20, Dec. 10th

✚ Simulation & Analysis (Session Room D)

Session Chair: Sunju Lee(Agency for Defense Development)

1. A Method of Calculating Weapon Effectiveness Index using Munition Trajectory and Vulnerability Data

Sunju Lee, Ye Lim Rhie, Sangjin Lee, Hyun-Shik Oh

2. A study on Standard Loss Analysis Model using big data

Seungho Lee, Jaeh Kim, Changkyu Lim, Yongpil Kim

3. Agent-based modeling of urban recovery: constructing an umbrella of recovery plans via virtual city twin and iterative algorithm approach
Lubashevskiy Vasily

[Poster: Pre-recorded video] KST 13:00 ~ 14:20, Dec. 10th

✚ Poster Session B(Poster Room B)

1. Custom Kubernetes Scheduler for Computation Offloading on Cloud Collaborated Edge Computing Servers: Use Case of Tollgate Selecting Monte-Carlo Simulation
Junhee Lee, Jaeho Jeon, SungJoo Kang
2. Hybrid spare parts demand forecasting using deep learning: A case study
Yeonoh Jeong, Jae-Dong Kim, Jin-Young Choi

[Oral: Live Stream] KST 15:40 ~ 17:20, Dec. 10th

✚ Simulation Theory and AI (Session Room D)

Session Chair: Changbeom Choi(Hanbat National University, Korea)

1. Formal Requirement Specification Method for Quality Assurance of Discrete Event Simulation Software
Sooyoung Jang, Changbeom Choi
2. Random Forest for Genetic Algorithm Optimization: Making it Quick and Interpretable
Shunichi Tada, Taro Kanno
3. Beneficial advertising coordination in the mobile channel added O2O era
Yang Bai
4. The Simulation-based Scheduling System Focusing on Back-end Stages in Semiconductor Foundry
Jaehun Sim, Wonju Ro, Dong Ok Kim, Dug Hee Moon

[Korean Session: Live Stream] KST 13:00 ~ 14:20, Dec. 10th

🚩 Korean Session (Korean Session Room)

Session Chair: Hyung Jong Kim (Seoul Women's University, Korea)

1. AUTOSAR Model simulation Method for Verification of Runnable Entity Execution Flow

Park Jun Hyuk, Lee Jung Tae

2. Development of Operational Algorithm and Mission Control Simulation for a Submarine Free-running Model

Jooho Lee, Seonhong Kim, Jinhyeong Ahn, Jihwan Shin

3. Submarine Maneuvering Characteristics Study Based on Sensitivity Analysis

Jinhyeong Ahn, Jihwan Shin, Seonhong Kim, Jooho Lee

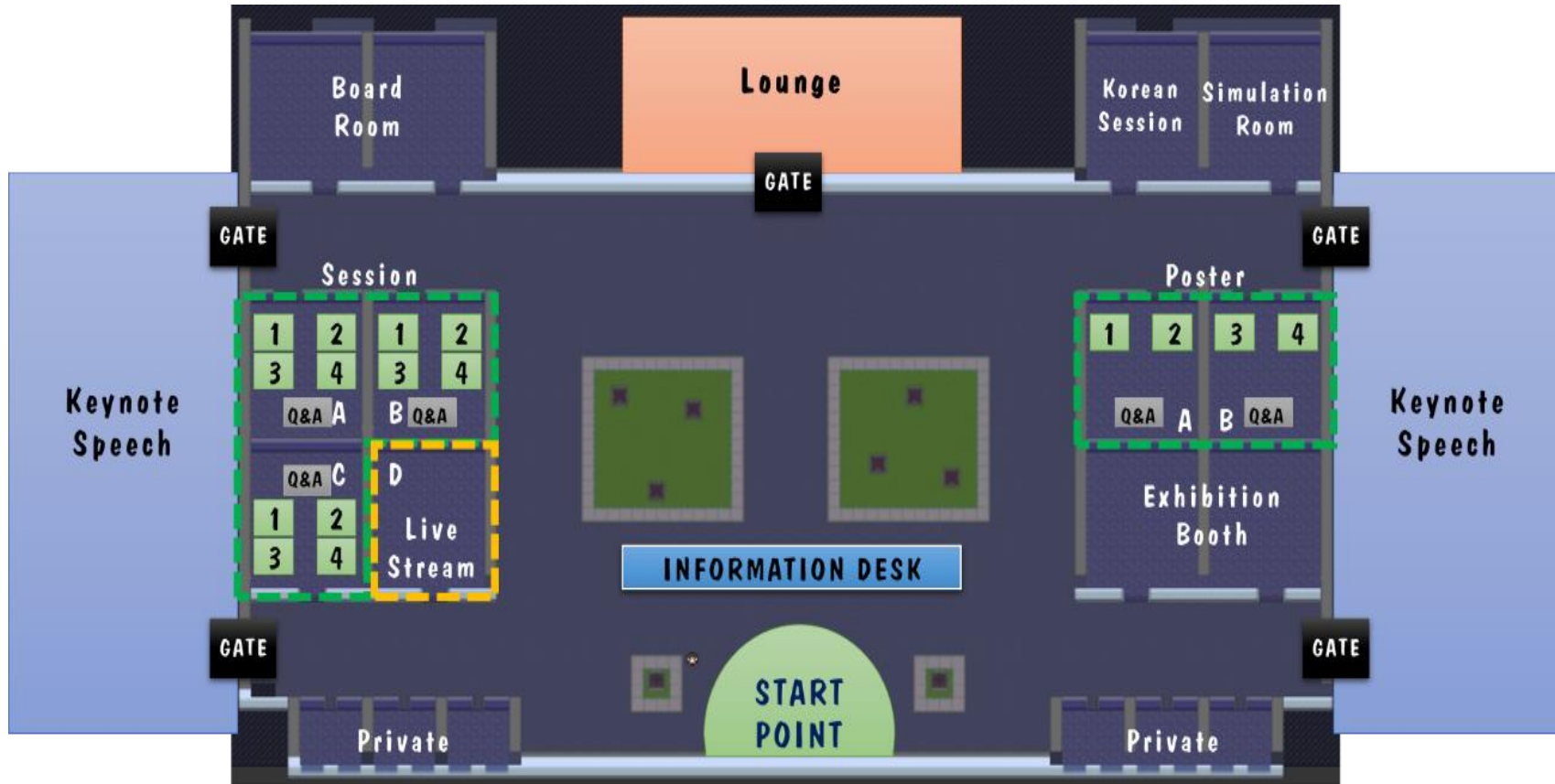
4. Development of Multimode control system for a Tactical Maneuvering of a Submarine

Joohyun Woo, Jongyong Park, Hyunkyu Yoon, Jooho Lee, Seonhong Kim

Asia Simulation Conference 2021: At a Glance

Date	Time(KST)	Oral Session	Poster Session	Korean Session
Dec.8	10:00-12:00	Registration		
	13:30- 14:00	Self-Guided Venue Tour		
	14:10-15:50	Modeling Methodology - Session Room A	-	-
	16:00-17:20	Cyber and National Security - Session Room B	-	-
Dec.9	10:00 - 10:30	Opening Ceremony – Keynote Room		
	10:40 - 11:20	Keynote speech (Prof. David Goldsman, Georgia Institute of Technology, USA) - Keynote room		
	13:00 -14:20	Simulation and Visualization -Session Room D	Poster Session A - poster room A	-
	14:40-15:20	Keynote Speech(Dr. Byunghee Kim, VMS Solutions Co. Ltd., Korea) - Keynote room		
	15:40-17:20	Simulation and Transportation, Logistics -session room D	-	-
Dec.10	9:00 - 10:20	Simulation Application - session room A	-	-
	10:40 - 11:20	Keynote speech(Prof. Lin Zhang, Beihang University, China)- Keynote room		
	13:00 -14:20	Simulation & Analysis - session room D	Poster Session B - poster room B	Korean Session Room
	14:40-15:20	Keynote speech(Prof. Satoshi Tanaka, Ritsumeikan University, Japan)- Keynote room		
	15:40-17:20	Simulation Theory and AI - session room D	-	-
	17: 30-	Closing remarks- Keynote room		
Dec.11	10:00-12:00	Best Oral Presentation Review & Selection		
	13:30-	AsiaSim 2021 Committee Chairs Meeting -Keynote Room		

Venue Map



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