



THE SOCIETY FOR
MODELING & SIMULATION
INTERNATIONAL

SUMMERSIM

Summer Simulation Conference 2019

JULY 22-24, 2019

Technical University of Berlin, Berlin, Germany



2019 SummerSim Sponsors



SCS and SummerSim'19
Thanks to the above Sponsors

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General Information

Registration

Your registration for SCS's 2019 Summer Simulation Conference (SummerSim'19) includes morning and afternoon breaks each day, the Monday evening reception and access to all sessions, tutorials and offsite events (unless otherwise noted). Location of event is Technical University of Berlin, Main Building (Building H) Straße des 17. Juni 135, 10623 Berlin.

- **Registration Hours (Room, H-3006)**

- ◇ **Monday, July 22, 2019** 8:00 a.m. - 5:00 p.m.
- ◇ **Tuesday, July 23, 2019** 8:00 a.m. - 5:00 p.m.
- ◇ **Wednesday, July 24, 2019** 8:00 a.m. - 3:00 p.m.

Please note that the Registration Desk will be closed for lunch Mon-Wed from 12:00 p.m.-1:30 p.m.

- **Coffee Breaks (Room, H-3006)**

- ◇ **Monday, July 22, 2019** 10:30 a.m. - 11:00 a.m. | 3:30 p.m.-4:00 p.m.
- ◇ **Tuesday, July 23, 2019** 10:30 a.m. - 11:00 a.m. | 3:00 p.m.-3:30 p.m.
- ◇ **Wednesday, July 24, 2019** 10:30 a.m. - 11:00 a.m.

- **Plenary Session and Keynote (Room, H-3005)**

- ◇ **Monday 11:00 a.m.-12:30 p.m.** - SCS Keynote:
Prof. Dr. Dr. h.c. Sahin Albayrak
- ◇ (See Keynote pages for more information on the speakers)

General Information

Conference Meetings & Events

- • Sunday: SCS Board Meeting (9:00 a.m.)
*SCS Board Members
- • Monday: Tutorials (8:30 a.m.—10:30 a.m.); (See tutorial pages)
Social (5:30 p.m.-7:00 p.m.)
*All conference attendees invited

Workshop: Life, Work and Impact of Institutes and Research Centers

Time: 8:30 a.m. – 10:30 a.m. (Room, H-3003A)

- • Tuesday SummerSim 2020 Organization Meeting
(12:30 p.m.—1:30 p.m.)
*By invitation only

Workshop: Strategic Engineering

Session III Time: 11:00 a.m. – 12:30 p.m.
(Room, H-3003A)

Panel: Modeling and Simulation Education in CPS Era

Session IV Time: 1:30 p.m. – 3:00 p.m.
(Room, H-3003A)

Workshop: Future of M&S Education

Session V Time: 3:30 p.m. – 5:00 p.m.
(Room, H-3003A)

Best Paper Award

The Overall Best Paper Award for Summersim'19 will be presented at Tuesday's Plenary Session. (10:00 a.m.—10:30 a.m.)

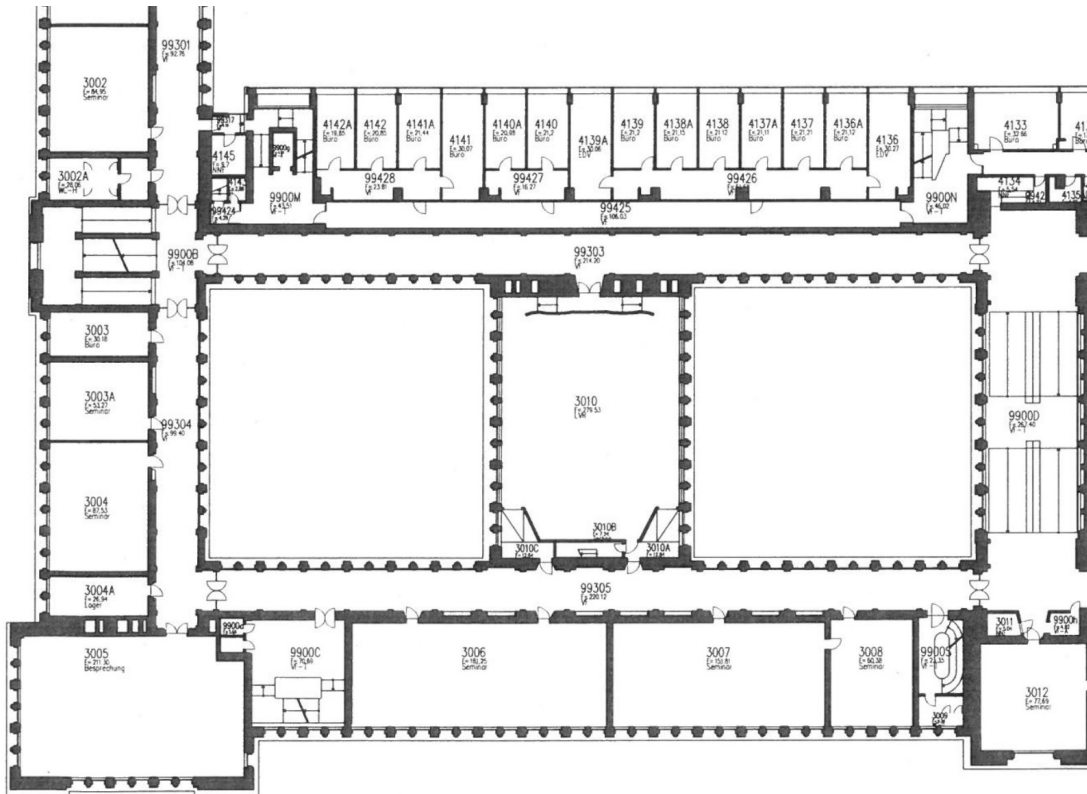
Posters

The posters will be on display throughout the week to be viewed in the break area.

Technical University of Berlin

Main Building H

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SummerSim'19

SummerSim'19 Organizing Committee

General Chair: Umut Durak, German Aerospace Center (DLR),
Germany

Honorary Chair: Axel Lehmann, Universitat der bundeswehr
Munchen ,Germany

Vice General Chair: Joachim Denil, University of Antwerp,
Belgium

Program Chairs: Alfredo Garro, University of Calabria, Italy and
Malamati Louta, University of Western Macedonia, Greece

Proceedings Chairs: Christina Deatcu, University of Wismar,
Germany and Megan Olsen, Loyola University, USA

Publicity Chairs: Alberto A. Del Barrio, Complutense University of
Madrid (UCM), Spain

Tutorial Chair: Alberto Falcone, University of Calabria, Italy

M&S Demo Session and Student Colloquium Chair: George
Karetsos, Technology Education Institute of Thessaly, Greece

Awards Chair: Andrea D'Ambrogio, University of Rome Tor
Vergata, Italy

Local Chair: Nils Masuch, Technische Universitat Berlin,
Germany

WIP Chair: Ken Vanherpen

SummerSim '19 Conference Committees

2019 Summer Computer Simulation Conference (SCSC 2019)

General Chair: Joachim Denil, University of Antwerp, Belgium

General Co-Chair: Alfredo Garro, University of Calabria, Italy

Sub-Tracks

Applied Theory of Modeling and Simulation (AToMS)

Chair: Jose L. Risco Martin

Cyber-Physical Systems (CPS)

Chairs: Joachim Denil and Alfredo Garro

Humans, Societies and Artificial Agents (HAS)

Chair: Saikou Diallo

Modeling and Simulation in Aerospace (AeroSim)

Chair: Alessandro Golkar

Simulation in the System Design Flow (SDF)

Chair: Alberto A. Del Barrio

Modeling and Simulation as a Service (MSaaS)

Chair: Andrea D'Ambrogio

Grand Challenges in Modeling and Simulation (GC)

Chair: Ali Elkemel

Emergency Modeling and Simulation (EMS)

Chairs: Francesco Longo and Letizia Nicoletti

Smart Grids and Smart Districts: Simulation-based Technologies for
Intelligent Energy Management, System Control and Communication

Chairs: Rolf Egert and Andrea Tundis

International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS 2019)

General Chair: Malamati Louta, University of Western Macedonia,
Greece

Welcome from the SummerSim '19 Conference Chairs

Welcome from the SummerSim'19 Chairs

On behalf of the Organization Committee, we are delighted and honored to welcome you to the Summer Simulation Conference 2019 (SummerSim'19) in the spectacular city of Berlin.

Berlin is the capital and the largest city of Germany. It is a city of culture, politics and science, home to world-renowned universities, museums, orchestras and entertainment venues. It is famous with its diverse architecture, festivals, avant-garde arts scene and nightlife.

SummerSim is organized by the Society for Modeling & Simulation International (SCS), the oldest Modeling and Simulation society in the world, which, from its foundation in 1952, promotes the advancement of Modeling and Simulation and connect Modeling and Simulation professionals worldwide. SummerSim is SCS's premier international conference in cooperation with ACM SIGSIM. The conference focuses on modeling and simulation, tools, theory, methodologies and applications and provides a forum for the latest R&D results in academia and industry. The SummerSim'19 program includes an excellent selection of peer-reviewed papers, presentations, plenary talks, tutorials, a panel discussion and a distinguished keynote. We sincerely thank the Technical University of Berlin, Distributed Artificial Intelligence Laboratory (DAI-Labor) and Arbeitsgemeinschaft Simulation (ASIM) for their invaluable support that made this conference possible.

We would also like to thank our keynote speaker Sahin Albayrak, for graciously accepting to share their vast knowledge and experiences with us. Sahin Albayrak is full professor at Technical University of Berlin, where he is the head of the DAI-Labor and chair of Agent Technologies in Business Applications and Telecommunication. He will give a keynote on "Digital Twins and Artificial Intelligence – the Future of Simulations".

Our thanks also go to all members of the Organization Committee for their dedicated and tireless effort. It was truly a team effort. The committee consists of:

Honorary Chair	Axel Lehmann, Universität der Bundeswehr München, Germany
General Chair	Umut Durak, German Aerospace Center (DLR), Germany
Vice General Chair	Joachim Denil, University of Antwerp, Belgium
Program Chairs	Alfredo Garro, University of Calabria, Italy Malamati Louta, University of Western Macedonia, Greece
Publicity Chair	Alberto A. Del Barrio, Complutense University of Madrid, Spain
Proceedings Chairs	Christina Deatcu, University of Wismar, Germany Megan Olsen, Loyola University, USA

Welcome from the SummerSim '19 Conference Chairs

Proceedings Chairs	Christina Deatcu, University of Wismar, Germany Megan Olsen, Loyola University, USA
Tutorial Chair	Alberto Falcone, University of Calabria, Italy
Awards Chair	Andrea D'Ambrogio, University of Rome Tor Vergata, Italy
Local Chair	Nils Masuch, Technische Universität Berlin, Germany
M&S Demo Session and Student Colloquium Chair	George Karetsos, University of Thessaly, Greece
WIP Chair	Ken Vanherpen, University of Antwerp, Belgium

Two core tracks of SummerSim'19 are 51th Summer Computer Simulation Conference (SCSC 2019) and 22nd International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS 2019). SCSC 2019 is co-chaired by Joachim Denil, University of Antwerp, Belgium and Alfredo Garro, University of Calabria, Italy. Besides 48 regular papers and a panel discussion, SCSC presents this year also a plenary talk from Hans Vangheluwe on "Multi-Paradigm Modelling of Cyber-Physical Systems". Hans Vangheluwe is a Professor in the Antwerp Systems and Software Modelling (AnSyMo) group within the Department of Mathematics and Computer Science at the University of Antwerp in Belgium. SPECTS 2019 is chaired by Malamati Louta from the University of Western Macedonia in Greece. Besides 10 regular papers, SPECTS presents this year also a plenary talk from Andreas Pitsillides on "Using any Surface to Realize a New Paradigm for Wireless Communications, through Software-controlled Metasurfaces". Andreas Pitsillides is a Professor at the Department of Computer Science at the University of Cyprus, where he leads the NetRL, the Networks Research Laboratory.

Additionally, thanks to all sub-track chairs for promoting the research topics of their tracks and for carrying out the papers review and selection process. We are very grateful to program committee members and to all the volunteers that have dedicated their time and effort to review and edit all submissions, thus making it possible to setup a program of selected and high quality presentations. We also express our gratitude to authors and tutorial presenters for submitting their relevant work to SummerSim.

Special thanks go to the SCS Executive Director, Oletha Darensburg, and her staff, Carmen Ramirez, for the expert and smooth running of conference coordination activities.

Our sincere and profound gratitude goes finally to Prof. Saikou Y. Diallo, Vice President for SCS Conferences, for his exceptional support in shaping various things for SummerSim over the organization process.

Welcome from the SummerSim '19 Conference Chairs

SummerSim'19 is hosted by the internationally renowned Technical University of Berlin, one of Germany's largest technical universities. Once again welcome to Berlin and thank you for making SummerSim'19 a success through your participation. We look forward to your continued participation in SummerSim'20.

Umut Durak, General Chair



Joachim Denil, Vice General Chair



Alfredo Garro, Program Chair



Malamati Louta, Program Chair



KEYNOTE

Keynote

Prof. Dr. Dr. h. c. Sahin Albayrak

Date: July 22, 2019

Time: 11:30 a.m.—12:30 p.m.

Location: H3005

Presentation Title: **Digital Twins and Artificial Intelligence
the Future of Simulations?**



Presentation Abstract: Simulation techniques are an important approach to understand systems, which are too complex and dynamic to compute their behavior analytically. However, simulations need reliable models and realistic input data to represent the world in a sufficient manner. With the emergence of the Internet-Of-Things and the possibility to retrieve real data in huge distributed scenarios we can now gain much more insights into the details of real systems, which leads to the approach of digital twins. For replicating reality, digital twins are one of the most promising trends, currently especially used in Industry 4.0 scenarios but also in other domains. Based on the details digital twins do offer, the potential of AI techniques such as (meta-)machine learning can be exploited to use data for intelligent decision making also in simulations. In his talk, Prof. Albayrak will describe the features of digital twin technology combined with AI techniques and what they mean to the simulation research area. The talk will underline the importance of digital twins by showing two projects regarding autonomous driving and process optimization in production plants.

Biography: Professor Albayrak received his Ph. D. in Computer Science at the TU Berlin in 1992. He is the Head of the Distributed Artificial Intelligence Laboratory (DAI-Labor), which was founded by him in 1992. In 2003, he was appointed as Professor at the TU Berlin; chair “Agent Technologies in Business Applications and Telecommunication”. He is a founding member and member of the Steering Board of Deutsche Telekom Laboratories (Concern Research of the Deutsche Telekom AG), since 2004. He is the founding member of the Center for ICT (EICT) in Berlin, 2005. He is an Initiator and CEO of the “Connected Living e.V.” innovation center, which has more than 50 members from research and industry, since 2009. He is the Chief Executive Director of the German-Turkish Advanced ICT Research Centre (GT-ARC) based in Berlin and Istanbul, since 2012. He is an Entrepreneur and founder of various start-ups, most recently IOLITE GmbH, 2014. Beside numerous Best Paper awards and prizes, he received the Bundesverdienstkreuz (Federal Cross of Merit) from the Federal Republic Germany for his efforts to German-Turkish research cooperation and contribution to innovation, 2014. He has been consulting several ministries in Germany and Turkey, as well as the management of well-known companies on technology and business strategies.

Track Speakers

Andreas Pitsillides

Symposium on Performance Evaluation of Computers and Telecommunication Systems (SPECTS)

[Using any Surface to Realize a New Paradigm for Wireless Communications, through Software-controlled Metasurfaces.](#)

Date: July 23, 2019

Time: 9:00 a.m.—10:00 a.m.

Location: H-3005

Partial Summary: Wireless communications is undeniably becoming ubiquitous in everyday life, with user demands growing at a very fast pace. Despite impressive breakthroughs in almost every part of our wireless systems—from antennas to hardware to operating software—this demand is getting increasingly challenging to address. The humongous scale of research effort and investment in the upcoming 5th generation of wireless communications (5G) reflects the scale of the challenge. This talk will introduce a valuable and unnoticed resource, which could be exploited to tackle these increasing challenges.

Hans Vangheluwe

Summer Computer Simulation (SCSC)

[Multi-Paradigm Modelling of Cyber-Physical Systems \(MPM4CPS\)](#)

Date: July 24, 2019

Time: 9:30 a.m.—10:30 a.m.

Location: H-3005

Partial Summary: The networking of multi-physics (mechanical, electrical, hydraulic, biochemical, ...) with computational systems (control systems, signal processing, logical inferencing, planning, ...) processes, interacting with often uncertain environments, with human actors, in a socio-economic context, leads to so-called Cyber-Physical Systems (CPS). The CPS that are engineered today are reaching a hitherto unseen complexity. To date, no unifying theory nor systematic design methods, techniques and tools exist for such systems. Individual (mechanical, electrical, network or software) engineering disciplines only offer partial solutions. Multi-paradigm Modelling (MPM) proposes to model every part and aspect/view of such complex systems explicitly, at the most appropriate level (s) of abstraction, using the most appropriate modelling formalism(s). This includes the explicit modelling of the often-complex engineering workflows. Modular modelling language engineering, including model transformation, and the study of modelling language semantics, are used to realize MPM. MPM is seen as an effective answer to the challenges of designing CPS. This presentation introduces a vision of complex CPS, in particular in the context of Industry 4.0. The causes of complexity of such systems and some of the challenges of their collaborative development are introduced, as well as possible multi-paradigm modelling solutions such as (in-) consistency management and co-simulation.

Tutorials Information

Monday, July 22, 2019

Tutorial Chair: Alberto Falcone

Tutorial Session A Time: 8:30 a.m. – 10:30 a.m.

(Room, H-3004) Chair: Alberto Falcone

Information and Process Modeling for Simulation: How To Model Manufacturing Systems by Gerd Wagner

An Introduction to Statecharts Modelling, Simulation, Testing, and Deployment by Simon Van Mierlo and Hans Vangheluwe

Tutorial Session B Time: 8:30 a.m. – 10:30 a.m.

(Room, H-3007) Chair: Alfredo Garro

Applying Modelling and Simulation for Development Embedded Systems by Gabriel Wainer

Introduction to Modeling and Simulation of Spatial Systems with Cell-DEVS by Gabriel Wainer

Tutorial Session C Time: 8:30 a.m. – 10:30 a.m.

(Room, H-3008) Chair: Andrea D’Ambrogio

Introduction to JavaScript-Based Simulation by Luis Gustavo Nardin

Modeling Future Generations of Vehicular Autonomous Networks for Intelligent Transportation Systems by Floriano De Rango

Workshops and Panel

Monday, July 22, 2019
Room: H-3003A

Workshop: Life, Work and Impact of Institutes and Research Centers

Saikou Diallo and LeRon Shults
Time: 8:30 a.m. – 10:30 a.m.

Tuesday, July 23, 2019
Room: H-3003A

Workshop: Strategic Engineering

Chair: Agostino Bruzzone
Session III Time: 11:00 a.m. – 12:30 p.m.

Panel: Modeling and Simulation Education in CPS Era

Chair: Umut Durak
Panelist: Alfredo Garro, Hans Vangheluwe, Denil Joachim, Andrea D'Ambrogio, Gabriel Wainer, Gregory Zacharewicz
Session IV Time: 1:30 p.m. – 3:00 p.m.

Workshop: Future of M&S Education

Chair: Umut Durak
Session V Time: 3:30 p.m. – 5:00 p.m.

Agenda At-A-Glance

Monday, July 22, 2019

8:00 a.m.	-	5:00 p.m.	Registration
8:30 a.m.	-	10:30 a.m.	Tutorials
10:30 a.m.	-	11:00 a.m.	Morning Coffee Break
11:00 a.m.	-	11:30 a.m.	Welcome and Opening
11:30 a.m.	-	12:30 p.m.	Prof. Dr. Dr. h.c. Sahin Albayrak
12:30 p.m.	-	1:30 p.m.	Lunch (on your own)
1:30 p.m.	-	3:30 p.m.	Session Block I
3:30 p.m.	-	4:00 p.m.	Afternoon Coffee Break
4:00 p.m.	-	5:30 p.m.	Session Block II
5:30 p.m.	-	7:00 p.m.	Reception

Tuesday, July 23, 2019

8:00 a.m.	-	5:00 p.m.	Registration
9:00 am	-	10:00 a.m.	SPECTS Plenary
10:00 a.m.	-	10:30 a.m.	Best Paper Award
10:30 a.m.	-	11:00 a.m.	Morning Coffee Break
11:00 a.m.	-	12:30 p.m.	Session Block III
12:30 p.m.	-	1:30 p.m.	Lunch (on your own)
1:30 p.m.	-	3:00 p.m.	Session Block IV
3:00 p.m.	-	3:30 p.m.	Afternoon Coffee Break
3:30 p.m.	-	5:00 p.m.	Session Block V
5:30 p.m.	-	7:00 p.m.	Technical Visits

Wednesday, July 24, 2019

8:00 a.m.	-	3:00 p.m.	Registration
9:30 a.m.	-	10:30 a.m.	SCSC Plenary
10:30 a.m.	-	11:00 a.m.	Morning Coffee Break
11:00 a.m.	-	12:30 p.m.	Session Block VI
12:30 p.m.	-	1:30 p.m.	Lunch (on your own)
1:30 p.m.	-	3:00 p.m.	Session Block VII
3:00 p.m.	-	3:30 p.m.	Farewell

Agendas

SCSC General 2019 Agenda

Monday, 22 July 2019
Location-H-3004

Session I: Humans, Societies and Artificial Agents (HSA)

1:30 p.m.-3:30 p.m.

Session Chair: Don Berndt

- *Simulation-Supported Assessment of Qualification and Department Organization in Industrial Maintenance* by Gert Zülch
- *Quasi-potential Field: The Simulation of Motivation in Complex Physical Structures* by Yang Tian, Weihua He and Yihan Jia
- *Adaptive Agents Modeling and Simulation in Artificial Financial Market* by Dalel Kanzari and Yosra Ben Said
- *Using Agent-Based Modeling to Assess the Implications of Changing Liquidity Conditions* by Don Berndt, David Boogers, Saurav Chakraborty and Carles Cabre

Session II: Simulation in the System Design Flow (SDF)

4:00 p.m.-5:30 p.m.

Session Chair: Alberto A. Del Barrio

- *A Nominal/Inertial Delay Metamorphic Differential Simulator* by Peter Maurer
- *A Study on the Parallelization of Moeas to Predict the Patient's Response to the Onabotulinumtoxin Treatment* by Franklin Parrales, Alberto Antonio Del Barrio Garcia and Jose L. Ayala
- *Simulating and Executing Circuits Employing the Quantum Computing Paradigm* by Daniel David Abellán, Antonio Valdivia, Alberto Antonio Del Barrio Garcia, Guillermo Botella and Ginés Carrascal

SCSC General 2019 Agenda

Monday, 22 July 2019
Location-H-3007

Session I: Cyber-Physical Systems (CPS)

1:30 p.m.-3:30 p.m.

Session Chair: Joachim Denil

- *Towards Virtual Validation of Distributed Functions* by Peter Baurmann
- *A Simulation Based Interaction Analysis of Automated Vehicles* by Lennart Luttkus, Lars Mikelsons, Peter Baumann and Oliver Kotte
- *Cross-Layer Behavioral Modeling and Simulation of E/E-Architectures Using PREEvision and Ptolemy II* by Harald Bucher, Simon Kamm and Juergen Becker
- *Cyber-Physical Systems Engineering: Model-Based Solutions* by Alfredo Garro, Vittorio Vaccaro, Stefan Dutré and Jef Stegen

Session II: Cyber-Physical Systems (CPS)

4:00 p.m.-5:30 p.m.

Session Chair: Alfredo Garro

- *Optimizing Fault Injection in FMI Co-Simulation Through Sensitivity Partitioning* by Mehrdad Moradi, Cláudio Gomes, Bentley James Oakes and Joachim Denil
- *A Configurable Gateway for DDS-HLA Interoperability* by M. Cagri Kaya, Alper Karamanlioglu, I. Caglar Cetintas, Erkin Cilden, Haluk Canberi and Halit Oguztuzun
- *Teaching Co-Simulation Basics Through Practice* by Thomas Paris, Jean-Baptiste Wiart, Denis Netter and Vincent Chevrier

SCSC General 2019 Agenda

Tuesday, 23 July 2019
Location-H-3004

Session III: Modeling and Simulation in Aerospace (AeroSim)

11:00 a.m.-12:30 p.m.

Session Chair: Alessandro Golkar

- *Optimization-Driven Product Development to Support Digital Twin Creation on the Small UAV Case Study* by Mikhail Gusev, Sergei Nikolaev, Anatolii Papulov, Sergei Belov, Daniil Padalitsa and Ighor Uzhinsky
- *Experiences in Using the SISO Space Reference FOM Standard* by Björn Möller, Alberto Falcone, Alfredo Garro and Edwin Z. Crues
- *Model-Based Technology Roadmapping: Potential and Challenges Ahead* by Raffaele Gradini, Sandro Salgueiro, Jyotsna Budideti and Alessandro Golkar

Session IV: Modeling and Simulation in Aerospace (AeroSim and SGSD)

1:30 p.m.-3:00 p.m.

Session Chair: Alessandro Golkar

- *Rule Based Target Evaluation in Air Defense* by Mehmet Hocaoglu
- *AATOM: An Agent-Based Airport Terminal Operations Model Simulator* by Stef Janssen, Alexei Sharpanskykh, Richard Curran and Koen Langendoen
- *On the Simulation of Smart Grid Environments* by Rolf Egert, Andrea Tundis and Max Mühlhäuser

Session V: Smart Grids and Smart Districts: Simulation-based Technologies for Intelligent Energy Management, System Control and Communication (SGSD)

3:30 p.m.-5:00 p.m.

Session Chair: Andrea Tundis

- *Requirements Modelling to Help Decision Makers to Efficiently Renovate Energy System of Urban Districts* by Mathias Bouquerel, Enrique Kremers, Jonathan Van Der Kamp, Thuy Nguyen and Audrey Jardin
- *A Routing Algorithm increasing the Transmission Availability in Smart Grids* by Francesco Buccafurri, Lorenzo Musarella and Roberto Nardone
- *Adversarial Deep Learning for Energy Management in Buildings* by Aaron Visaggio and Fiammetta Marulli

SCSC General 2019 Agenda

Tuesday, 23 July 2019
Location-H-3007

Session III: Applied Theory of Modeling and Simulation (AToMS)

11:00 a.m.-12:30 p.m.

Session Chair: Christina Deatcu

- *Exploratory Dynamic Capacity Analysis of Defence Forces* by Fred Ma
- *Markov Chains Aggregation Using Discrete Event Optimization via Simulation* by Laurent Capocchi, Jean-Francois Santucci and Bernard Zeigler
- *PDEVS Protocol Performance Prediction using Activity Patterns with Finite Probabilistic DEVS* by Laurent Capocchi, Jean-Francois Santucci and Bernard Zeigler

Session IV: Applied Theory of Modeling and Simulation (AToMS)

1:30 p.m.-3:00 p.m.

Session Chair: Christina Deatcu

- *Avoiding State Space Explosion of Model Checking Using Discrete Event Simulation : Combining DEVS and PROMELA* by Abdelhak Khemiri, Amine Hamri, Claudia Frydman and Jacques Pinaton
- *Redistribution Systems and PRAM* by Paul Cohen and Tomek Loboda
- *A Hybrid Simulation Model for Optimal Color-Batching Resequencing in Paint Shop* by Jinling Leng, Chun Jin, Alexander Vogl and Dirk Wortmann

Session V: Applied Theory of Modeling and Simulation (AToMS)

3:30 p.m.-5:00 p.m.

Session Chair: Gabriel Wainer

- *Formalizing Distributed Self-Adaptive Systems Using High-Level Petri Nets* by Lorenzo Capra and Matteo Camilli
- *Cellular Discrete-Event Models for Social Systems* by Ifeoluwa Oyelowo, Guillermo Trabes and Gabriel Wainer
- *Characterizing Rollbacks in Parallel Optimistic Simulations* by Dhananjai Rao

SCSC General 2019 Agenda

Wednesday, 24 July 2019
Location-H-3007

Session VI: Applied Theory of Modeling and Simulation (AToMS)

11:00 a.m.-12:30 p.m.

Session Chair: Gabriel Wainer

- *An Integrated Modeling, Simulation and Experimentation Environment in Python Based on SES/MB and DEVS* by Hendrik Folkerts, Thorsten Pawletta, Christina Deatcu, Jean-Francois SANTUCCI and Laurent Capocchi
- *Edge Federation Simulator for Data Stream Analytics* by Román Cárdenas Rodríguez, Patricia Arroba, José L. Risco-Martín and José M. Moya
- *Traffic Modeling and Simulation: A DEVS Library* by Gabriel Wainer

Session VII: Applied Theory of Modeling and Simulation (AToMS)

1:30 p.m.-3:00 p.m.

Session Chair: Umut Durak

- *Modular Framework to Model Critical Events in Stroke Patients* by Kevin Henares, José L. Risco-Martín, Jose L. Ayala and Hermida Roman
- *Towards A Standard Computational Representation for System Entity Structures* by Bikash Chandra Karmokar, Umut Durak, Sven Hartmann and Bernard Zeigler

SCSC General 2019 Agenda

Wednesday, 24 July 2019
Location-H-3004

Session VI: Grand Challenges in Modeling and Simulation (GC)

11:00 a.m.-12:30 p.m.

Session Chair: Gerd Wagner

- *Show Me Your Properties! The Potential of Property-Based Testing in Agent-Based Simulation* by Jonathan Thaler and Peer-Olaf Siebers
- *Mesh Generation Based on the Parameterization of NURBS Surface That can be Used for Self-Organized Potential Based Shape Determination* by Dietmar Moeller
- *Distributed Building Energy Simulation with the HLA* by Kwabena Amponsah, Sameh Zakhary, Darren Robinson, Brian Logan, Paul Nathanail and Peer-Olaf Siebers

Session VII: Grand Challenges in Modeling and Simulation (GC)

1:30 p.m.-3:00 p.m.

Session Chair: Gerd Wagner

- *Process Design Modeling with Extended Event Graphs* by Gerd Wagner
- *Maintenance Policy Simulation for a Factored Partially Observable System* by Demet Ozgur-Unluakin and Ipek Kivanc
- *Towards a Modeling Language for Processing Network Simulation* by Gerd Wagner

SCSC General 2019 Agenda

Wednesday, 24 July 2019
Location-H-3003A

Session VI: Emergency Modeling and Simulation (EMS)

11:00 p.m.-12:30 p.m.

Session Chair: Francesco Longo

- *Multiple Drones Driven Hexagonally Partitioned Area Exploration: Simulation and Evaluation* by Ayush Datta, Rahul Tallamraju and Kamalakar Karlapalem
- *A Self-Adaptive UAV Routing for Forest Fire Risk Mitigation: A Conceptual Model* by Sezgin Kilic and Omer Ozkan

SCSC General 2019 Agenda

Wednesday, 24 July 2019
Location-H-3007

Session VI: Modeling and Simulation as a Service (MSaaS)

11:00 a.m.-12:30 p.m.

Session Chair: Andrea D'Ambrogio

- *Large-Scale Traffic Simulation for Smart City Planning* by Julius Weyl, Daniel Glake, Ulfia A. Lenfers, Fabian Panse, Norbert Ritter and Thomas Clemen
- *A Microservice-Based Approach for Fine-Grained Simulation in MSaaS Platforms* by Paolo Bocciarelli, Andrea D'Ambrogio, Andrea Giglio and Emiliano Paglia
- *Analytics and Visualization of Spatial Models as A Service* by Bruno St-Aubin, Eli Yammine, Majed Nayef and Gabriel Wainer

22nd SPECTS 2019 Agenda

Tuesday, 23 July 2019

Location-H-3008

Session III: Efficiency in Systems and Networks

11:00 a.m.-12:30 p.m.

Session Chair: Alexander Maltsev

- *A Novel Energy Optimization Approach for Artificial Intelligence-Enabled Massive Internet of Things* by Ali Hassan Sodhro, Mohammad S.Obaidat, Sandeep Pibhulal, Gul Hassan Sodhro, Noman Zahid and Abhimanyu Rawat
- *Performance Evaluation of Frameworks for iBeacon-Based Localization using Bluetooth Low Energy* by Paolo Bellavista, Antonio Corradi, Mattia Ferrari, Luca Foschini, Pasquale Carlo Maiorano Picone and Rebecca Montanari
- *Research and Implementation of Efficient Parallel Processing of Big Data at TELBE User Facility* by Mohammed Bawatna

Session IV: Performance of Networking Technologies and Telecommunication Systems

1:30 p.m.-3:00 p.m.

Session Chair: George Karetsos

- *Performance of Multi-Pair Two-Way Full-Duplex Massive MIMO Relay Systems with Direct Link* by Mahmoud Zaher, Engy Maher and Ahmed El-Mahdy
- *Joint Detection and the AoA Estimation of Noncoherent Signals in Multi-Element Antennas* by Olesya Bolkhovskaya, Alexander Maltsev and Victor Sergeev
- *3D Channel Modeling and Characterization for Hypersurface Empowered Indoor Environment at 60 GHz Millimeter-Wave Band* by Rashi Mehrotra, Rafay Iqbal Ansari, Alexandros Pitilakis, Shuai Nie, Christos Liaskos, Nikolaos Kantartzis and Andreas Pitsillides

22nd SPECTS 2019 Agenda

Tuesday, 23 July 2019

Location-H-3008

Session V: Case Studies, Tools and Methodologies

3:30 p.m.-5:00 p.m.

Session Chair: Rashi Mehrotra

- *Influence of the Trace Resolution and Length in the Cost Optimization Process in Cloud Computing* by Javier Garcia, Joaquín Entrialgo, José Luis Díaz, Manuel García and Daniel Garcia
- *The Effect of Global and Local Influence Models on the Quality of Recommendations* by Nikolaos Mantas, Malamati Louta, Iraklis Varlamis and Magdalini Eirinaki
- *Which is Better for Learning: A Web-Based Educational Application or an Educational Game?* By Konstantina Chrysafiadi, Spyros Papadimitriou and Maria Virvou
- *Influence of the Perceived Data Security, Credibility, Trust and Confidence on the Usage Frequency of Internet Services and the Provision of Security Measures* by Erik Massarczyk and Peter Winzer

WIP 2019 Agenda

Monday, 22 July 2019
Location-H-3008

Session I: Work in Progress I

1:30 p.m.-3:30 p.m.

Session Chair: Ken Vanherpen

- *Co-Evolution of Disaster Resilience in Complex Social Systems* by Sakiko Ogawa, Taro Kanno and Kazuo Furuta
- *Computational Studies on Ureter Smooth Muscle: Modeling ION Channels and Their Role in Generating Electrical Activity* by Chitaranjan Mahapatra and Rohit Manchanda
- *NIM: Generative Neural Networks for Modeling and Generation of Simulation Inputs* by Emily Herbert, Wang Cen and Peter Haas

Session II: Work in Progress II

4:00 p.m.-5:30 p.m.

Session Chair: Ken Vanherpen

- *A Framework for Simulating Mobility Services in Large Scale Agent-Based Transportation Systems* by Christian Rakow
- *Simulation Investigation of the Efficiency of the V2G Concept Under Consideration of the Daily Traffic Volume* by Bianca Scheibel

Industry 2019 Agenda

Monday, 22 July 2019
Location-H-3003A

Session I

1:30 p.m. – 3:30 p.m.

Session Chair: Erkin Cilden

- *A Reference Architecture for Military Simulations with Experimentation and Analysis Features* by Gökçe Özkan, Erkin Çilden, Emre Gültekin, Ahmet Sezer and Haluk Canberi
- *“Simulation Study to Check the Adequacy of Flux Circuit at Steel Melting Shops to Achieve a Targeted Production Level at a Large Integrated Private Sector Steel Plant”* by Shantilal Shambharkar, Soumen Das, Sanjaya Kumar Pattanaik, Supratim Baruah, Sandeepan Mukherjee, Rama Shanker Singh and Debashis Das

Strategic Engineering 2019

Agenda

Tuesday, 23 July 2019

Location-H-3003A

Session III

11:00 a.m. – 12:30 p.m.

Session Chair: Agostino Bruzzone

- *Application of Blockchain in Interoperable Simulation for Strategic Decision Making* by Agostino Bruzzone, Kirill Sinelshchikov and Marina Massei
- *A Digital Twin Approach to Develop a New Autonomous System Able to Operate in High Temperature Environments Within Industrial Plants* by Kirill Sinelshchikov
- *Libra ad Bellum Novum: A Political and Military Escalation in the Near East as Scenario for Support Advanced Strategic Decision Making* by Agostino Bruzzone and Paolo Di Bella

Things to do in Berlin

Things to Do in Berlin

Brandenburg Gate

Address: Pariser Platz, 10117 Berlin

Website: <https://www.berlin.de/en/attractions-and-sights/3560266-3104052-brandenburg-gate.en.html>

The Brandenburg Gate is an 18th-century neoclassical monument in Berlin, built on the orders of Prussian king Frederick William II after the successful restoration of order during the early Batavian Revolution.

Reichstag Building

Address: Platz der Republik 1, 11011 Berlin | Phone: +49 30 22732152

Website: <https://www.bundestag.de/en>

The Reichstag is a historic edifice in Berlin, Germany, constructed to house the Imperial Diet of the German Empire. It was opened in 1894 and housed the Diet until 1933, when it was severely damaged after being set on fire.

Museum Island

Address: Berlin, Germany

An island in the Spree River in the central Mitte district of Berlin, Germany, the site of the old city of Cölln. It is so-called for the complex of internationally significant museums, all part of the Berlin State Museums, which occupy the island's northern part.

East Side Gallery

Address: Mühlenstraße 3-100, 10243 Berlin | Phone: +49 30 2517159

Website: <http://www.eastsidegallery-berlin.com/>

The East Side Gallery is an open-air gallery in Berlin. It consists of a series of murals painted directly on a 1,316 m long remnant of the Berlin Wall, located near the centre of Berlin, on Mühlenstraße in Friedrichshain-Kreuzberg. The gallery has official status as a Denkmal, or heritage-protected landmark.

Berlin Cathedral Church

Address: Am Lustgarten, 10178 Berlin | Phone: +49 30 20269136

Website: <https://www.berlinerdom.de/en/>

Berlin Cathedral is the common name for the Evangelical Supreme Parish and Collegiate Church in Berlin, Germany. It is located on Museum Island in the Mitte borough. The current building was finished in 1905 and is a major work of Historicist architecture of the "Kaiserzeit".

Memorial to the Murdered Jews of Europe

Address: Cora-Berliner-Straße 1, 10117 Berlin | Phone: +49 30 2639430

Website: <https://www.stiftung-denkmal.de/en/home.html>

The Memorial to the Murdered Jews of Europe, also known as the Holocaust Memorial, is a memorial in Berlin to the Jewish victims of the Holocaust, designed by architect Peter Eisenman and engineer Buro Happold.

Things to Do in Berlin

Berlin Wall Memorial

Address: Bernauer Str. 111, 13355 Berlin | Phone: +49 30 467986666

Website: <https://www.berliner-mauer-gedenkstaette.de/en/>

The Gedenkstätte Berliner Mauer commemorates the division of Berlin by the Berlin Wall and the deaths that occurred there. The monument was created in 1998 by the Federal Republic of Germany and the Federal State of Berlin.

Checkpoint Charlie

Address: Friedrichstraße 43-45, 10117 Berlin

Website: <https://www.berlin.de/en/attractions-and-sights/3560059-3104052-checkpoint-charlie.en.html>

Checkpoint Charlie was the name given by the Western Allies to the best-known Berlin Wall crossing point between East Berlin and West Berlin during the Cold War.

Charlottenburg Palace

Address: Spandauer Damm 20-24, 14059 Berlin | Phone: +49 30 320911

Charlottenburg Palace is the largest palace in Berlin, Germany. It is in the Charlottenburg district of the Charlottenburg-Wilmersdorf borough. The palace was built at the end of the 17th century and was greatly expanded during the 18th century. It includes much lavish internal decoration in baroque and rococo styles.

Zoo Berlin

Address: Hardenbergplatz 8, 10787 Berlin | Phone: +49 30 254010

Website: <https://www.zoo-berlin.de/en>

The Berlin Zoological Garden is the oldest and best-known zoo in Germany. Opened in 1844 it covers 35 hectares and is located in Berlin's Tiergarten. With about 1,380 different species and over 20,200 animals, the zoo presents one of the most comprehensive collection of species in the world.

Jewish Museum Berlin

Address: Lindenstraße 9-14, 10969 Berlin | Phone: +49 30 25993300

Website: <https://www.jmberlin.de/en>

The Jewish Museum Berlin was opened in 2001 and is the largest Jewish museum in Europe. It consists of three buildings, two of which are new additions specifically built for the museum by architect Daniel Libeskind.

Topography of Terror

Address: Niederkirchnerstraße 8, 10963 Berlin | Phone: +49 30 25450950

Website: <https://www.topographie.de/en/topography-of-terror/>

An outdoor and indoor history museum in Berlin, Germany. It is located on Niederkirchnerstrasse, formerly Prinz-Albrecht-Strasse, on the site of buildings, which during the Nazi regime from 1933 to 1945 was the SS Reich Main Security Office, the headquarters of the Sicherheitspolizei, SD, Einsatzgruppen and Gestapo.

Restaurants in Berlin

Zur Letzten Instanz

Address: Waisenstrasse 14-16, 10179 Berlin, Germany | Phone: +49 30 2425528

Website: <https://zurletzteninstanz.com/en/>

Description: The restaurant is the eldest restaurant in Berlin and ranks among the sights of the capital. Its origin is in 1621, when a former equestrian servant of the elector opened a gin mill at this place. The restaurant got its present name when mainly guests from the nearby court came to drink their experiences, "in the last instance". Historic additions survived despite the reconstruction after the war, even Napoleon himself was served in the restaurant at the tiled stove. The two restaurants, private room and beer garden invite guests to stay. Berlin cuisine a la carte with exclusive regional products and fresh beer on tap ensure culinary moments in original ambiance.

The Store Kitchen

Address: Torstrasse 1, 10119 Berlin, Germany | Phone: +49 30 405044550

Website: <https://www.thestores.com/berlin>

Description: The Store X's Berlin outpost first opened its doors in February 2015, spanning two floors of the Soho House Building in Mitte, Berlin. Through a creative edit of fashion, furniture, music, art and books, alongside food from Cecconi's and The Store Kitchen, and exclusive exhibitions and events in our Studios, The Store X Berlin invites visitors to explore an innovative take on the retail experience, one that brings local and international creatives together in an ever-evolving conversation.

Du Bonheur

Address: Brunnenstr. 39, 10115 Berlin, Germany | Phone: +49 30 56591955

Website: <https://www.dubonheur.de/>

Description: Here, enjoyment is their top priority. The decoration, reduced to the essentials, serves to set the mood for the varied taste experience. In Du Bonheur only spelled is processed, as this is largely grown without chemical fertilizer and by the overgrown with the grain spelled is protected against harmful environmental influences. Taste and visual is the difference hardly recognizable for wheat in the finished product.

Cocolo Ramen

Address: Gipsstr. 3, 10119 Berlin, Germany | Phone: +49 172 3047584

Website: <https://kuchi.de/restaurant/cocolo-ramen/>

Description: The Cocolo Ramen Bar in Mitte is the institution for traditional Japanese Ramen noodle soups. Vegetarian and vegan options available. Cocolo's rich tonkotsu broth and house made, perfectly chewy noodles are well worth standing in line for a seat at this tiny restaurant in Mitte.

CordoBar

Address: Grosse Hamburger Str. 32, 10115 Berlin, Germany | Phone: +49 30 27581215

Website: <https://www.cordobar.net/en/>

Description: Cordobar features a carefully curated list of over 1,000 different wines, which has made it the prime after-hour hangout for Berlin's chefs. Cordobar's Lukas Mraz also cooks some of the city's most innovative bar food.

Restaurants in Berlin

Lokal

Address: Linienstr. 160, 10115 Berlin, Germany | Phone: +49 30 28449500

Description: A refreshingly simple restaurant with an unpretentious, seasonal menu and a casual vibe, it feels timeless, and six years after its opening is still one of the exemplars of modern, terroir-focused German cooking.

Pauly Saal

Address: Auguststr. 11-13, 10117 Berlin, Germany | Phone: +49 30 33006070

Website: <http://www.paulysaal.com/en/>

Description: One of the most worthwhile and extravagant fine dining experiences in Berlin. Tip: Try the stellar cocktails and bar snacks in the connected Pauly Bar.

Mogg & Melzer Delicatessen

Address: Auguststr. 11-13, 10117 Berlin, Germany | Phone: +49 30 330060770

Website: <http://www.moggmogg.com/>

Description: Mogg is housed in an old red brick former Jewish Girl's School on Berlin's August Strasse, designed by Alexander Beers in 1927. The modernist stark exterior of the school come hospital is belied almost by the colorful art deco tiling in the communal areas. The buildings appearance, combined with its long history makes this a cultural must see in itself. Mogg was added to this eclectic mix in 2012 and quickly established itself as an institute on the berlin culinary scene. The menu is speckled with home comfort staples such as Matza Ball Soup and New York Cheesecake (locally known as the best in town), which sits comfortable aside seasonal salads and of course, the home cured and smoked pastrami- for which the deli is famous.

Salami Social Club

Address: Frankfurter Allee 43, 10247 Berlin, Germany | Phone: +49 30 81034937

Website: <http://www.salamisocialclub.de/>

Description: Salami social club is for people who love quality beer and damn delicious pizza – so everybody. You can get it delivered to your front room, eat it on the go or you can smash one in our bar.

Block House Friedrichstrasse

Address: Friedrichstrasse 100, 10117 Berlin | Phone: +49493020074377

Website: <https://www.block-house.de/block-house-restaurant-best-steaks-since-1968/?L=1>

Description: The Block House Restaurant in Berlin Center. 130 seats inside and 30 seats outside. Right next to the Berlin theater district, the admiral's palace and many more famous attractions. Good connections to public transport: Friedrichstraße station (U-and S-train) and bus stop. Wheelchair accessible.

Notes

Notes

NEW TRAINING!

Available at the 2020 Power Plant Simulation Conference (PowerPlantSim'20)

NUCLEAR POWER PLANT SIMULATOR TRAINING

JANUARY 12-16, 2020

The Westin Chattanooga | 801 Pine Street, Chattanooga, TN 37402

For over 60 years, SCS has set the standard as the first society devoted solely to the advancement of modeling and simulation. Our objective is to promote M&S as a discipline and profession through continuous research and education. We provide M&S professionals with a dynamic community and forum to publish, present, and discuss new results, developments, applications, and lessons learned, enabling the exchange between and mutual support of industry, government and academia.

Workshop Objectives

Be familiar with the functional/physical and testing requirements associated with a nuclear power plant simulator used for operator training and examination in accordance with ANSI/ANS-3.5-2009.

What Will You Gain From This Training

This workshop will address the functional/physical and testing requirements for full-scope nuclear power plant control room simulators for use in operator training and examination.

Who Should Attend?

Target audience includes simulator test operators and management associated with the administration of a simulator testing program in accordance with ANSI/ANS-3.5-2009.

What You Receive

Upon completion, you will receive a **Certificate of Training**.



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For questions and more information on registration and hotel details, email scs@scs.org, call 858-277-3888, or visit scs.org/powerplant