

ANNSIM'22 Agenda

Monday - July 18, 2022

ANNSIM 2022 Opening (8:30-9:00)

Opening, Introduction, Awards

Keynote Address (9:00-10:00)

Dr. Michael Grieves, Digital Twin Institute

Digital Twins: Utilizing M&S to Drive 21st Century Transformation

SimAUD (10:30-12:00) <i>Session 1: Urban Modeling & Building Detection</i>	MSM (10:30-12:00) <i>Session 1: Cardiovascular Applications</i>	SPECTS-CNS (10:30-12:00) <i>Session 1</i>	HPC (10:30-12:00)	MSCS (10:30-12:00)
<p>EXPLORING SPATIAL PATTERNS IN SUSTAINABLE INTEGRATED DISTRICTS: A METHODOLOGY FOR EARLY-PHASE URBAN NETWORK ANALYSIS A.D. Srikanth, C. Hablani, S. Gopalakrishnan and T. Schroepfer</p> <p>CAPTURING FAÇADE DIVERSITY IN URBAN SETTINGS USING AN AUTOMATED WINDOW TO WALL RATIO DETECTION WORKFLOW N. Tarkhan</p> <p>BUILDING ENVELOPE OBJECT DETECTION USING YOLO MODELS N. Bayomi, M. ElKholy, J.E. Fernandez, S. Velipasalar and T. Rakha</p> <p>SHADING DESIGN FOR OUTDOOR LEARNING IN WARM AND HOT CLIMATES USING EVOLUTIONARY COMPUTATION: A CASE STUDY IN HOUSTON TX. M. Kyropoulou</p>	<p>TIME- AND FREQUENCY-BASED INDEPENDENT EVALUATION OF QRST CANCELLATION TECHNIQUES FOR SINGLE-LEAD ELECTROCARDIOGRAMS DURING ATRIAL FIBRILLATION N.F. Price, O. Berenfeld, V. Devabhaktuni and M. Deo</p> <p>INTERACTIVE SIMULATION MODEL OF A CROSS-SCALE CARDIOVASCULAR SYSTEM S. Hofmann, A. Müller and S. von Mammen</p> <p>MODELING CARDIAC CELL BIOPHYSICS USING LONG-SHORT MEMORY NETWORKS B. Silveira Goncalves and M. Deo</p>	<p>DISTRIBUTED RESOURCE ALLOCATION IN 5G NETWORKS WITH MULTI-AGENT REINFORCEMENT LEARNING J. Menard, A. Al-Habashna, G. Wainer and G. Boudreau</p> <p>BOOLEAN LOGICAL OPERATOR DRIVEN SELECTIVE DATA FILTERING FOR LARGE DATASETS G. Davidson and S. Majumdar</p> <p>VIDEO ANALYTIC DATA REDUCTION MODEL FOR FOG COMPUTING Abdolreza Abhari and Dipak Pudasaini</p>	<p>THE EFFECTS OF NUMERICAL PRECISION IN SCIENTIFIC APPLICATIONS R. Murillo, A.A. Del Barrio Garcia and G. Botella</p> <p>MODEL AND EVALUATION OF A SUPERCONDUCTING-LOGIC BASED HYBRID CPU-ACCELERATOR SYSTEM M. Jagasivamani, C. Fong, K. Goodnow and R. Voigt</p>	<p>ANALYSIS OF THE IMPACT OF CYBER ATTACK ON SEMICONDUCTOR MANUFACTURING ENERGY QUANTIFICATION B. Ezici, P. Costa, J. Xu</p> <p>ADVERSARIAL MACHINE LEARNING USING CONVOLUTIONAL NEURAL NETWORK WITH IMAGENET U. Khakurel and D. Rawat</p> <p>LUUNU - BLOCKCHAIN, MISP, MODEL CARDS AND FEDERATED LEARNING ENABLED CYBER THREAT INTELLIGENCE SHARING PLATFORM E. Bandara, S. Shetty, R. Mukkamala, A. Rahaman, X. Liang</p>

Strategy Meeting Day 1: "How to get Published" Presented by Richard Jansz-Moore (12:30-13:30)

SimAUD (13:30-15:00) <i>Session 2: (Day) Lighting & Energy Exploration</i>	MSM (13:30-15:00) <i>Session 2: Physiology Simulation</i>	SPECTS-CNS (13:30-15:00) <i>Session 2</i>	TMS (13:30-15:00) <i>Session 1</i>	CPS (13:30-15:00) <i>Session 1</i>
<p>DETERMINING CRITICAL POINTS TO CONTROL ELECTRIC LIGHTING TO MEET CIRCADIAN LIGHTING REQUIREMENTS AND MINIMIZE ENERGY USE</p>	<p>IMPLEMENTATION OF A DYNAMIC AND EXTENSIBLE MECHANICAL VENTILATOR MODEL FOR REAL-TIME PHYSIOLOGICAL SIMULATION</p>	<p>CONTROLLER AREA NETWORK DISCRETE-EVENT SYSTEM SPECIFICATION FOR INDEPENDENT NODE TESTING</p>	<p>A QUANTIZED STATE INTEGRATOR WITH SECOND ORDER ERRORS OVER MONOTONIC SEGMENTS J. Nutaro and R. Mahawattege</p>	<p>A NEW MODELING FRAMEWORK FOR CYBER-PHYSICAL AND HUMAN SYSTEMS M. Poursoltan, N. Pinede, B. Vallespir and M.K. Traoré</p>

ANNSIM'22 Agenda

B. Abboushi and S. Safranek

J.B. Webb, A. Bray, J. Gerard, S. Frembgen, H. Scheirich, J. VanPelt and R. Clipp

M. Jamal, J. Boi-Ukeme and G. Wainer

DYNAMIC SUBSET SENSITIVITY ANALYSIS FOR DESIGN EXPLORATION
L. Hinkle, G. Pavlak, L. Curtis and N. Brown

INTEGRATIVE PHYSIOLOGY-COUPLED PILOT-CENTERED FLIGHT SIMULATION
S. Harrison, A. Bulysheva, R. Clipp, J. Webb, M. Mitchum, B. Newman and M. Audette

SOFTWARE-DEFINED OPTICAL LOCAL AREA NETWORK ARCHITECTURE AND PRIORITY TRAFFIC PERFORMANCE ANALYSIS
P. Baziana

MODEL AND EXECUTION SCALABLE TRAITS FOR INTERACTION (NEXUS) MODELING OF WATER AND ENERGY SYSTEMS
M. Fard and H. Sarjoughian

A DIGITAL TWIN BASED APPROACH FOR ENSURING BUSINESS CONTINUITY PLAN AND SAFE RETURN TO WORKPLACE
S. Barat, D. Mulpuru, A. Yadav, A. Basu, V. Kulkarni, S. Samudrala, A. Bhide, P. Thomas, K. Krishna, A. Yadav and A. Mazumder

IMPACT ASSESSMENT OF ENERGY CONSERVATION MEASURES ON BUILDING ENERGY CONSUMPTION, CARBON EMISSION, AND ADAPTATION COST USING FUTURE WEATHER DATA
Z. Zolfaghari, T. Raja, P. Kusumadjaja, D. Salinas, U.N. Kapini and P. Pease

ENABLING COLLABORATIVE MODELING THROUGH A WEB LIBRARY OF DEVS MODELS
H. Qassoud, B. St-Aubin, G. Wainer and C.R. Martin

MULTI-PARADIGM MODELLING FOR MODEL BASED SYSTEMS ENGINEERING: EXTENDING THE FTG+PM
R. Paredis, J. Exelmans and H. Vangheluwe

INTEGRATION OF THE MAPE-K LOOP IN DIGITAL TWINS
H. Feng, C. Gomes, S. Gil, P.H. Mikkelsen, D. Tola, M. Sandberg and P.G. Larsen

SimAUD (15:30-17:00)

Session 3: Building Envelope

MSM (15:30-17:00)

SPECTS-CNS (15:30-17:00)

Session 3

TMS (15:30-17:00)

Session 2

CPS (15:30-17:00)

Session 2

OPTIMIZATION-BASED DESIGN EXPLORATION OF THE MUTUAL INFLUENCE BETWEEN BUILDING MASSING AND FAÇADE DESIGN
X. Liu, L. Wang and G.H. Ji

**MSM Panel Discussion:
Convergence between Medical Simulation and Neural Networks**

AN IOT BASED SMART MONITORING SYSTEM DETECTING PATIENT FALL
H. Rajaei

DATA ASSIMILATION FOR SIMULATION-BASED REAL-TIME PREDICTION/ANALYSIS
X. Hu

KNOWLEDGE STRUCTURES OVER SIMULATION UNITS
E. Kamburjan and E.B. Johnsen

A STOCHASTIC APPROACH TO SIMULATE AND OPTIMIZE THE COATING UNIFORMITY OF ROTATIONAL MOLDING FOR MICROALGAE FACADES
C. Wu, G. Herbst, A. Lujan and K.H. Kim
PREDICTING COOLING ENERGY DEMANDS OF ADAPTIVE FACADES USING ARTIFICIAL NEURAL NETWORK
A. Alammar and W. Jabi
AUTOMATICALLY GENERATING SURFACE WIND PRESSURE IN HIGH-RISE BUILDINGS THROUGH DEEP LEARNING
L.S. Sun, S. Cao, L. Wang and G. Ji

INCREMENTAL TEXT CLUSTERING ALGORITHM FOR CLOUD-BASED DATA MANAGEMENT IN SCIENTIFIC RESEARCH PAPERS
M. Nilufar and A. Abhari

ESS: EMF-BASED SIMULATION SPECIFICATION, A DOMAIN-SPECIFIC LANGUAGE FOR MODEL VALIDATION EXPERIMENTS
J. Mertens and J. Denil

THE MODULAR DESIGN EVALUATION MODEL: SUPPORT FOR DECISION-MAKING IN CYBER-PHYSICAL SYSTEMS DESIGN
M.R. Modeer

GEOGRAPHICAL SEVIRD COVID-19 MODEL WITH TRAVEL RESTRICTIONS
C.R. Martin, N. Patel and G. Wainer

ANNSIM'22 Agenda

Tuesday - July 19, 2022

SimAUD (8:30-10:00)

Session 4: Urban Microclimate and Comfort

INFOMORPHISM: URBAN PLANNING FOR RENEWABLE ENERGY INTEGRATION VIA SIMULATED ENERGY EXCHANGE NETWORKS

F. Li, K.R. Schell and A. Tsamis

HOW THE URBAN MICROCLIMATE AND OUTDOOR THERMAL COMFORT CAN AFFECT INTRA-CITY MOBILITY PATTERNS: EVIDENCE FROM NEW YORK CITY

Y. Yang, D. Wang and T. Dogan

AN URBAN FEASIBILITY STUDY INTO BALANCING UPFRONT EMBODIED CARBON EMISSIONS THROUGH INTEGRATED GREEN AREAS AS CARBON OFFSETS

E.R. Newmarch, M. Donn, S.T. Twose, F. Short and D. Dowdell

SimAUD (10:30-12:00)

Session 5: Simulation Tools & Workflows

AN OPTIMIZATION FRAMEWORK AND TOOL FOR CONTEXT-SENSITIVE SOLAR-DRIVEN DESIGN USING GENERATIVE CELLULAR AUTOMATA (SDCA)

S. Luitjohan, N. Abbasabadi and M. Ashayeri

SKETCH TO BUILD: AN INTUITIVE DESIGN PLATFORM FOR

MSM (8:30-10:00)

Session 4: Deep & Machine Learning

SYNTHESIZING BURN WOUND IMAGES FOR DEEP LEARNING APPLICATIONS

B. Schenkenfelder, S. Kaltenleithner, B. Sabrowsky-Hirsch, C. Klug, D.B. Lumenta and J. Scharinger

FALL DETECTION USING SELF-SUPERVISED PRE-TRAINING MODEL

H.G. Yhdego, C. Paolini and M. Audette

MULTI-MODALITY BREAST MRI SEGMENTATION USING NN-UNET FOR PREOPERATIVE PLANNING OF ROBOTIC SURGERY NAVIGATION

M. Alqaoud, J. Plemmons, E. Feliberti, K. Kaipa, S. Dong, G. Fichtinger, Y. Xiao and M. Audette

MSM (10:30-12:00)

Session 5: Computer-Assisted Medicine (surg-plan, telemed, devices)

EXTENSIVE SIMULATION OF HUMAN-ROBOT INTERACTION FOR CRITICAL CARE TELEMEDICINE

I. Kim, A. Nepomuceno, J. Michel, S. Jamison and K. Kesavadas

SIMULATION-BASED FRAMEWORK TO DEVELOP A CONTROL SYSTEM FOR

HSAA/AIS (8:30-10:00)

Session 1: Applied HSAA/AIS

ENCODING PROTEST DURATION IN AN AGENT-BASED MODEL AS CHARACTERISTIC PHASE TRANSITIONS

B.J. Goode and B.S. Pires

TOWARD A MOVEMENT PARADIGM FOR ARTIFICIAL HUMAN AGENTS

T. Clemen, N. Ahmady-Moghaddam, D. Glake, U.A. Lenfers, F.J. Ocker, D. Osterholz and J. Strobele

USING GENERATIVE ADVERSARIAL NETWORKS TO ASSIST SYNTHETIC POPULATION CREATION FOR SIMULATIONS

S. Kotnana, D. Han, T. Anderson, A. Züfle and H. Kavak

HSAA/AIS (10:30-12:00)

Session 2: Policy Support by HSAA/AIS

**EXPERT PANEL DISCUSSION:
HOW CAN WE PROVIDE BETTER
SIMULATION-BASED POLICY
SUPPORT?**

A. Tolk, T. Clemen, N. Gilbert, and C. Macal
Moderator: T. Anderson

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SUSTAINABLE HOUSING
COMPLEXES
Z.P. Zhang and T. Narahara

A NOVEL MULTI-CRITERIA
WORKFLOW BASED ON REVERSE
SOLAR ENVELOPES FOR THE
DESIGN OF RESIDENTIAL
CLUSTERS
A. Sepúlveda and F. De Luca

SOFTWARE ARCHITECTURE FOR
BIM TO DEVS INTEGRATION
M.A. Patel, V.S. Rajus and G.
Wainer

FUNCTIONAL ELECTRICAL
STIMULATION
M. Hong, B.A. Hasse, A.J.
Fuglevand and J. Rozenblit

CONTEXT-AWARE SECURITY
MODES FOR MEDICAL DEVICES
M. Riegler, J. Rozenblit and J.
Sametinger

FULLY AUTOMATED CONVERSION
OF GLIOMA CLINICAL MRI SCANS
INTO A 3D VIRTUAL REALITY
MODEL FOR PRESURGICAL
PLANNING
R.N. Tucker, B.P. Sutton, C.
Duncan, C. Lu, S. Koyejo, A.J.
Tsung, J. Maksimovic, T. Ralph,
S.M. Pieta and M. T. Bramlet

Strategy Meeting Day 2: "How to Review" Presented by Richard Jansz-Moore (12:30-13:30)

SimAUD (13:30-15:00)

*Session 6: Ventilation & Impact
of Covid*

MEASURING DESIGN
SENSITIVITY: AN EVALUATION OF
ASSESSMENT METHODS AND
METRICS FOR NATURAL
VENTILATION STUDIES
N. Tarkhan and S. Mokhtar

A SIMULATION-BASED
APPROACH TO MITIGATE
DISEASE TRANSMISSION RISK
FROM AEROSOL PARTICLES IN
BUILDINGS
H. Parhizkar, S. Rockcastle, M.
Fretz and K.G. Van Den
Wymelenberg

THE INFLUENCE OF COVID
RELATED RESTRICTIONS ON THE
ENERGY CONSUMPTION OF THE

ANSS (13:30-15:00)

SIMULATION OF DISSEMINATION
STRATEGIES ON TEMPORAL
NETWORKS
L. Serena, S. Ferretti, M. Zichichi
and G. D'Angelo

AUTOMATED MODEL DISCOVERY
FOR STEERING BEHAVIOR
SIMULATION
H.H. Le and X. Hu

AUTOMATED GENERATION OF
PATIENT POPULATION FOR
DISCRETE-EVENT SIMULATION
USING PROCESS MINING

HSAA/AIS (13:30-15:00)

*Session 3: Combining Simulation
with AI/ML*

TAXONOMY, TOOLS, AND A
FRAMEWORK FOR COMBINING
SIMULATION MODELS WITH
AI/ML MODELS
V. Gehlot, P. Rokowski, E.B.
Sloane and N. Wickramasinghe

DEVS MODEL CONSTRUCTION AS
A REINFORCEMENT LEARNING
PROBLEM
I. David and E. Syriani

COMPOSING MODELING AND
SIMULATION WITH MACHINE
LEARNING IN JULIA

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BUILDING: THE VENTILATION
RATE EFFECT
R. Ashrafi, M. Azarbayjani, H.
Tabkhi and M.
Sheikhshahrokhdehordi

SimAUD (15:30-18:00)

*Session 7: Mixed Realities &
Robots*

INTEGRATING IMMERSIVE
VIRTUAL ENVIRONMENT USER
STUDIES INTO ARCHITECTURAL
DESIGN PRACTICE
G.D. Bailey, O. Kammler, R.
Weiser, S. Schneider and E.
Fuchkina

SERVER-BASED MIXED-REALITY
SYSTEM FOR MULTIPLE DEVICES
TO VISUALIZE A LARGE
ARCHITECTURAL MODEL AND
SIMULATIONS
R. Tsujimoto, T. Fukuda and N.
Yabuki

DEEP SANDSCAPES: DESIGN
TOOL FOR ROBOTIC SAND-
SHAPING WITH GAN-BASED
HEIGHTMAP PREDICTIONS
K. Tsuruta, S.J. Griffioen, R.L.
Johns and J.M. Ibáñez

SimAUD 2022 Closing Session (17:00-18:00)

Tutorial (10:30-12:00)

USING SIMULATION TO FINALIZE CERTIFICATION OF UNMANNED
AUTONOMOUS SYSTEMS OVER MULTI DOMAIN VIRTUAL TESTING
ENVIRONMENT
A. Bruzzone, R. Cianci and A. Giovannetti

Tutorial (1:30-15:00)

INTRODUCTORY TUTORIAL ON AGENT-BASED MODELING AND SIMULATION:
ABM DESIGN FOR THE COMING ZOMBIE APOCALYPSE
C. Macal

J. Le Lay, V. Augusto, J. Neveu
and B. Dalmas

Emerging Topic on Supply Chain Modeling (ET-SCM) (15:30-17:00)

A SIMULATION FRAMEWORK FOR
STUDYING FOREIGN RELIANCE
ON REGIONAL SUPPLY CHAINS AT
THE INDUSTRY LEVEL
Scott Rosen, Andrew E. Hong,
L.A. Rayson, W.S. Bland and J.A.
Richkus

SUPPLY CHAIN SIMULATION AS A
SERVICE TO INCREASE
ADAPTATION CAPABILITY IN
MANUFACTURING
T. Kiss, G. Terstyanszky, R. Arjun,
S. Sardesai, M.D. Goertz and M.
Wangenheim

C. Rackauckas, R. Anantharaman,
A. Edelman, S. Gowda, M.
Gwozdz, A. Jain, C. Laughman, Y.
Ma, F. Martinuzzi, A. Pal, U.
Rajput, E. Saba, V.B. Shah

MSBSE (15:30-17:00)

A MSaaS PLATFORM FOR
BUSINESS PROCESS MODELING &
SIMULATION
P. Bocciarelli, A. D'Ambrogio and
M.M. Cialel

VALIDATION OF EPSIM - AN
EMBEDDED PLATFORM
SIMULATOR FOR CONTROL-
EMBEDDED CO-DESIGN
K. Vanherpen, D. Maes, Y.
Vanommeslaeghe and P. De
Meulenaere

Tutorial (15:30-17:00)

DEFINING CELL-DEVS MODELS WITH CD++ ONLINE SIMULATION
ENVIRONMENT
G. Wainer and C. Ruiz Martin

ANNSIM'22 Agenda

Wednesday - July 20, 2022

Tutorials (09:00-12:00)

BUILDING A DISTRIBUTED AGENT-BASED MODEL WITH REPAST4PY
N. Collier and J. Ozik

APPLICATIONS OF DEEP LEARNING IN MODELING OF DYNAMICAL SYSTEMS
C.M. Legaard

Tutorials (09:00-12:00)

AN INTRODUCTION TO EQUATION-BASED OBJECT-ORIENTED MODELLING
AND SIMULATION WITH MODELICA
H. Vangheluwe

COMPLEX SIMULATION SPECIFICATION: DO YOUR SIMULATIONS MEET
THEIR NEEDS?
H. Sohier

Posters & Demos (12:00-14:00)