Final Program

The 21st IEEE/ACIS International Conference on Software Engineering Research, Management and Applications (SERA 2023)

May 23-25, 2023, Orlando, Florida, U.S.A.
Sheraton Orlando Lake Buena Vista Resort
https://acisinternational.org/conferences/sera-2023/
Conference Organizing Committee Members

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Roger Y. Lee Central Michigan University, U.S.A.

Conference Chair
Yeong-Tae Song Towson University

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Junghwan “John” Rhee University of Central Oklahoma
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Myungkyu Song University of Nebraska Omaha
Program at a Glance

Venue: Sheraton Orlando Lake Buena Vista Resort

Day 1 - Tuesday, May 23, 2023

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<tr>
<td>8:00 –10:30 AM</td>
<td>Registration</td>
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<td>8:20 - 8:40 AM</td>
<td>Opening Ceremony</td>
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<td>8:40 – 9:40 AM</td>
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<td>Plenary Session (Auditorium)</td>
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<td>10:00 AM – 12:00 PM</td>
<td>Sessions</td>
<td>A1: Special Session: Metaverse and Digital Twins</td>
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<td>Lunch (on your own)</td>
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<td>4:00 – 6:00 PM</td>
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<td>A3: Modeling and Analysis</td>
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<td>6:20 - 8:00 PM</td>
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<td>Time (EST)</td>
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<td>B5: Artificial Intelligence III</td>
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<td>12:00 – 1:00 PM</td>
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<td>1:20 – 3:00 PM</td>
<td>Sessions</td>
<td>A6: Bugs and Testing</td>
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<td>B6: Special Session: Software Engineering for AI and Blockchain</td>
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<td>3:00 - 3:20 PM</td>
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<td>3:20 – 5:40 PM</td>
<td>Sessions</td>
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<td>B7: Special Session: Software Engineering for AI and Blockchain</td>
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### Day 3 - Thursday, May 25, 2023

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<td>Sessions</td>
<td>Room 1: A8: Security Room 2: B8: Special Session: Theory and Application for Advanced Software System</td>
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<td>10:00 – 10:20 AM</td>
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<td>12:40 – 12:45 PM</td>
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<td>Closing Remark</td>
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<td>1:00 - 5:00 PM</td>
<td>Conference Organization Committee Meeting  (This event is only for conference organizers)</td>
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Keynote
Support of Assurance-based Software Development for Cyber-Physical Systems

Dr. Wuwei Shen
Email: wuwei.shen@wmich.edu

Professor, Western Michigan University, USA

Abstract

Cyber-Physical systems (CPSs) become more important in our daily life. Failure of CPSs can have some serious consequences such as loss of human life. To ensure the trustworthiness of a CPS, an assurance case has been proposed as a communication means between different stakeholders such as developers and certifiers. In this talk, we will introduce a novel framework that supports the integration of an assurance case into software development lifecycle by means of the Model-Driven Architecture. The framework not only provides an automatic mechanism to generate an assurance case in the Goal Structural Notation (GSN) but also supports the evaluation mechanism using the Dempster-Shafer (D-S) theory. The framework dramatically reduces the burden of the developers and certifiers when developing a CPS.

Biography

Wuwei Shen received his PhD from the Univ. of Michigan in computer science. He has been working on various techniques such as the Model-Driven Engineering (MDE) to increase automation in software development, implementation, and validation in various application domains. Dr Shen received the Senior Research Award from the National Research Council (NRC) Associateship Programs, the National Academies of Sciences, Engineering, and Medicine in 2017. He also received several fellowships from the Visiting Faculty Research Program (VFRP), the Air Force Research Laboratory's Information Directorate (AFRL/RI) from 2015 to 2018.
Program in Detail

Day 1 - Tuesday, May 23, 2023

8:00 – 10:30 AM – Registration

8:20 – 8:40 AM – Opening Ceremony

8:40 – 9:40 AM – Keynote – Dr. Wuwei Shen

9:40 – 10:00 AM – Coffee Break

10:00 AM – 12:00 PM -- Special Session A1: Metaverse and Digital Twins
Chair: Dr. Yongik Yoon (Sookmyung Women’s University)

The Strategy of Digital Twin Convergence Service based on Metaverse
JiEun Kang, Subi Kim and Yongik Yoon

SDCG: Silhouette-based Deep Clustering with GNN for Improved Graph Node Clustering
Hyesoo Shin, Eunjo Jang, SoJung Kim and Ki Yong Lee

TI-former: A Time-Interval Prediction Transformer for Timestamped Sequences
Hyewon Ryu, Sara Yu and Kiyong Lee

Anomalous Node Detection in a Graph Considering Text Features
Yeonju Song and Kiyong Lee

Cloud-based Digital Twins Storage in Emergency Healthcare
Erdan Wang, Pouria Tayebi and Yeong-Tae Song

10:00 AM – 12:00 PM -- Session B1: Artificial Intelligence I
Chair: Stavros Kalafatis (Texas A&M) – Remote hosting

A Data Mining Approach to Construct Classification Model for Predicting Tourism Graduates
Employability
Anna Sheila Crisostomo, Riah Encarnacion and Shakir Al Balushi
(Virtual presentation)

Towards Imbalanced Large Scale Multi-label Classification with Partially Annotated Labels
Xin Zhang, Yuqi Song, Fei Zuo, Zheqing Zhou and Xiaofeng Wang

Robust Federated Learning: A Heterogeneity Index Based Clustering Approach
Papa Pene, Pu Tian, Weixian Liao, Qianlong Wang and Wei Yu

Digital Twins of Smart Campus: Performance Evaluation Using Machine Learning Analysis
Adamu Hussaini, Cheng Qian, Yifan Guo, Chao Lu and Wei Yu

A Bottom-Up Generic Probabilistic Building and Enriching approach for knowledge graph using the
LDA-based clustering method
Amani Mechergui, Sami Zghal and Wahiba Ben Abdessalem Karaa
12:00 – 1:40 PM – Luncheon (on your own)

1:40 – 3:40 PM -- Session A2: Software
Chair: Xiaopeng Li (Microsoft)

Room 1

Analysis of Software Engineering Practices in General Software and Machine Learning Startups
*Bishal Lakha, Kalyan Bhetwal and Nasir Eisty*
(Virtual presentation)

Analyzing the Effects of CI/CD on Open Source Repositories in GitHub and GitLab
*Jeffrey Fairbanks, Akshharaa Tharigonda and Nasir Eisty*
(Virtual presentation)

Domain-specific Modeling Environment Construction Tool based on View Patterns: RapidDSM
*Masumi Kawakami and Fuyuki Ishikawa*

Evaluating Code Metrics in GitHub Repositories Related to Fake News and Misinformation
*Jason Duran, Mostofa Najmus Sakib, Nasir Eisty and Francesca Spezzano*

Documentation Practices in Agile Software Development: A Systematic Literature Review
*Md Athikul Islam, Rizbanul Hasan and Nasir Eisty*
(Virtual presentation)

Room 2

1:40 – 3:40 PM -- Session B2: Network and System
Chair: Chao Lu (Towson University)

Balance-aware Cost-efficient Routing in the Payment Channel Network
*Suhan Jiang, Jie Wu, Fei Zuo, and Alessandro Mei*

A Dynamic Wireless Sensor Network Deployment Algorithm for Emergency Communications
*Kubra Gundogan, Nuri Alperen Kose, Khushi Gupta, Damilola Oladimeji and Fan Liang*

Obsolescence in Operating Systems and Microprocessors
*Dheeraj Naraharisetti, Ramesh Karne, Joel Weymouth and Alexander Wijesinha*

A Blockchain-Based Verification Process for Smart Cities
*Raad Haddad, Dhiaa El Diehni I. Abou-Tair and Ala Khalifeh*

Reinforcement of collaborative work in the metaverse through playful activities
*Nicia Guillén Yparrea and Felipe Hernández-Rodríguez*

3:40 – 4:00 PM – Coffee Break

Foyer
4:00 – 6:00 PM -- Session A3: Modeling and Analysis  
Chair: Junghwan Rhee (University of Central Oklahoma)  
Room 1

Generating Timed Scenarios from Behaviours  
David Katz and Neda Saedlooie

Using Effective Dummy Locations and Routes to Conceal User Locations  
Sanjaikanth E Vadakkethil Somanathan Pillai and Wen-Chen Hu

Data-Driven Smart Manufacturing Technologies for Prop Shop Systems  
Zhicheng Xu, Weinan Gao, Zhicun Chen, Rami Haddad, Scot Hudson, Ezebuugo Nwaonumah, Frank Zahiri and Jeremy Johnson

Multi-objective particle swarm optimization approach for population classification in emergency management  
Bethsy Guerrero Granados, María Valle Rada, Mauricio Restrepo, Christian G. Quintero M., César Viloria Núñez, Miguel Jimeno and Jairo Alberto Cardona

Misinformation Detection Using an Ensemble Method with Emphasis on Sentiment and Emotional Analyses  
Sanjaikanth E Vadakkethil Somanathan Pillai and Wen-Chen Hu

4:00 – 6:00 PM -- Session B3: IoT, Automotive, Cyber Physical Systems  
Chair: Lin Deng (Towson University)  
Room 2

Nighttime Vehicle Classification based on Thermal Images  
Xianshan Qu, Nathan Huynh, Robert Mullen and John Rose

Programming Model for Information Sharing among IoT Devices: Software Engineering Perspective  
Samuel Cho and Myoungkyu Song  
(Video presentation)

Named Data Networking (NDN) for Data Collection of Digital Twins-based IoT Systems  
Hengshuo Liang, Cheng Qian, Chao Lu, Lauren Burgess, John Mulo and Wei Yu

An Assurance Case Driven Development Paradigm for Autonomous Vehicles: An F1Tenth Racing Car Case Study  
Ioannis Nearchou, Lance Rafalko, Ryan Phillips, Matthew Anderson, Wuwei Shen and Steven Drager

Towards an Adversarial Machine Learning Framework in Cyber-Physical Systems  
John Mulo, Pu Tian, Adamu Hussaini, Hengshuo Liang and Wei Yu

6:20 – 8:00 PM – Dinner Banquet (provided by conference)  
TBD
8:00 – 10:00 AM -- Session A4: Code Analysis
Chair: Masato Oguchi (Ochanomizu University, Japan)
Room 1

Applications of Causality and Causal Inference in Software Engineering
*Patrick Chadbourne and Nasir Eisty*

Automating code assessment based on PowerShell for programming courses
*Fei Zuo, Junghwan Rhee, Myung-Ah Park, and Gang Qian*

TIPICAL - Type Inference for Python In Critical Accuracy Level
*Jonathan Elkobi, Bernd Gruner and Clemens-Alexander Brust*

Consideration of Semantics between Q&A Statements to Obtain Factor Score
*Yuya Yokoyama*

8:00 – 10:00 AM -- Session B4: Artificial Intelligence II
Chair: Xianshan Qu (Microsoft)
Room 2

LSTM-AE for Anomaly Detection on Multivariate Telemetry Data
*Anes Abdennebi, Alp Tunçay, Cemal Yılmaz, Anil Koyuncu and Oktay Gungor*
(Virtual presentation)

Fake News Detection Using Machine Learning Techniques
*Achhiya Sultana, Mahmudul Islam, Mahady Hasan and Farruk Ahmed*
(Virtual presentation)

Deep Learning Model to Improve the Stability of damage Identification via Output-only Signal
*Jongyeop Kim, JinKi Kim, Matthew Sand and Seongsoo Kim*

Anomaly Detection in Intrusion Detection System using Amazon SageMaker
*Ian Trawinski, Hayden Wimmer and Jongyeop Kim*

A Comparative Study of Deep Learning Models for Hyper Parameter Classification on the UNSW-NB15
*Seongsoo Kim, Lei Chen, Jongyeop Kim, Yiming Ji and Rami Haddad*

10:00 – 10:20 AM – Coffee Break
Foyer
10:20 AM – 12:00 PM -- Session A5: Performance  
Chair: Yuseok Jeon (UNIST)  
Room 1

Evaluation of Improvement Plans to Increase the Efficiency of Performance Data Collection/Transfer for Server Systems  
Chika Iiyama, Akira Hirai, Mari Yamaoka, Naoto Fukumoto and Masato Oguchi

Evaluating the Performance of Containerized Webservers against web servers on Virtual Machines using Bombardment and Siege  
Daniel Ukene, Hayden Wimmer and Jongyeop Kim

Time-Series Trend-Based Multi-Level Adaptive Execution Tracing for Performance Analysis  
Mohammed Adib Khan and Naser Ezzati-Jivan

Analysis of Programming Performance Based on 2-grams of Keystrokes and Mouse Operations  
Kazuki Matsumoto, Kinari Nishiura, Mariko Sasakura and Akito Monden

10:20 AM – 12:00 PM -- Session B5: Artificial Intelligence III  
Chair: Xiaopeng Li (Microsoft)  
Room 2

Texture and Orientation-based Feature Extraction for Robust Facial Expression Recognition  
Sajid Ali Khan, Mohammed Bin Abdulrahman Alawairdhi and Mousa Al-Akhras  
(Virtual presentation)

Split and Federated Learning with Mobility in Vehicular Edge Computing  
Sungwon Moon and Yujin Lim

Classification of Multilingual Medical Documents using Deep Learning  
Ben Abdessalem Wahiba Wahiba and Dridi Kawther

Phishy? Detecting Phishing Emails Using ML and NLP  
Md Fazle Rabbi, Arifa Champa and Minhaz Zibran

12:00 – 1:00 PM – Luncheon (provided by conference)  
TBD
1:20 PM – 3:00 PM -- Session A6: Bugs and Testing
Chair: Jim Alves-Foss (University of Idaho)

Determining the Most Significant Metadata Features to Indicate Defective Software Commits
Rupam Kumar Dey, Anahita Khojandi and Kalyan Perumalla

A Library-Based Approach for Writing Design Assertions
Yoonsik Cheon, Ricardo Lozano and Rajasoundarya Senthil Prabhu

A Test Suite Minimization Technique for Testing Numerical Programs
Prashanta Saha, Clemente Izurieta and Upulee Kanewala

A Systematic Literature Review on Test Case Prioritization and Regression Test Selection
Zhengxin chao Xiao and Lei Xiao

1:20 PM – 3:00 PM – Special Session B6:
Special Session B6: Software Engineering for AI and Blockchain
Chair: Simon Xu (Algoma University)

Research on the Ranking of Social Q&A Community Answer Quality Based on Entropy Weight Method and AHP Weight
Chenqing Tsai, Chenyu Zhou, Kai Song

DeepFake Detection Using Graph Representation with Multi-dimensional Feature
Jia Chen, Weiguo Lin, Junfeng Xu

Design and Implementation of Scientific Research Achievement Transformation System
Jinbao Song, Jiahui Cai, Ran Li, Yanan Li

Research and Application of Content-based Image Hash Retrieval Algorithm
Xinquan Luo, Xingyu Tan

3:00 – 3:20 PM – Coffee Break

Foyer
3:20 PM – 5:40 PM -- Session A7: Potpourri  
Chair: Yuseok Jeon (UNIST)  
Room 1

Increase Patients’ Survivability During Emergency Care using Blockchain-based Digital Twin Technology  
_Shirin Hasavari, Yeong-Tae Song and Benjamin Lawner_

Integrated Framework for Efficient Educational Software Development  
_Bassey Isong, Alain Mbiada and Francis Lugayizi_

A Learning Enhancement System for Learner’s Community  
_Yuta Ishii, Ayako Sugiyama, Kosuke Fukushima, Ryotaro Okada and Takafumi Nakanishi_

Enhancing Students’ Job Seeking Process Through A Digital Badging System  
_Hamdan Alabsi, Majed Almotairi, Yahya Alqahtani and Mohammed Alyami_

Another Software for Designing Electric Transformers  
_Jangwu Jo, Junhyun Park, Ayoung Jang, Youngsu Chon and Byeongdo Kang_ (Virtual presentation)

Agile User-Centered Design Framework to Support the Development of E-Health for Patient Education  
_Ira Puspitasari_ (Virtual presentation)

3:20 PM – 5:40 PM –  
Special Session B7: Software Engineering for AI and Blockchain  
Chair: Simon Xu (Algoma University)  
Room 2

Cona: A Novel Context-aware Knowledge Graph Completion Method  
_Zechen Jia, Jiangtao Ma_

Construction of Systematic Financial Risk Index System and Policy Suggestions in China  
_Yongguang Fu, Yuping Li_

Construction and Application of Knowledge Graph for Food Therapy  
_Qianzhong Chen, Xianghao Meng_

Rule-Based Representation Learning for Traditional Chinese Medicine Knowledge Graph  
_Dongsheng Shi, Feng Lin_

Experimental Evaluation of Adversarial Attacks Against Natural Language Machine Learning Models  
_Jonathan Li, Steven Pugh, Honghe Zhou, Lin Deng, Josh Dehlinger and Suranjan Chakraborty_,  
(Special Session: Security Paper)
Day 3 - Thursday, May 25, 2023

8:00 AM – 10:00 AM -- Session A8: Security
Chair: Fei Zuo (University of Central Oklahoma)

Detection of Anomalies in the HDFS Dataset
*Marwa Chnib and Wafa Gabsi*

Calibrating Cybersecurity Experiments: Evaluating Coverage Analysis for Fuzzing Benchmarks
*Jim Alves-Foss, Aditi Pokharel, Shigdel Ronisha and Jia Song*

Identifying Code Tampering Using A Bytecode Comparison Analysis Tool
*Young Lee, Arlen McDonald and Jeong Yang*  
(Virtual presentation)

Are We Aware? An Empirical Study on the Privacy and Security Awareness of Smartphone Sensors
*Arifa Islam Champa, Md Fazle Rabbi, Farjana Eishita and Minhaz Zibran*

3 B (Block Byte Bit) Cipher Algorithm for Secure Socket Layer
*Yong Pil Geum*

8:00 AM – 10:00 AM –
Special Session B8: Theory and Application for Advanced Software System
Chair: Junghwan Rhee (University of Central Oklahoma)

Detection of a Novel Object-Detection-Based Cheat Tool for First-Person Shooter Games Using Machine Learning
*Zhang Xiao, Takaaki Goto, Partha Ghosh, Tadaaki Kirishima, Kensei Tsuchida*  
(Virtual presentation)

Novel Music Genre Classification System using Transfer Learning on a Small Dataset
*Yi Wang, Takaaki Goto, Tadaaki Kirishima, Kensei Tsuchida*  
(Virtual presentation)

Improve Accuracy of PC Skill Assessment using PC Operation Log Data
*Haotian Yan, Tadaaki Kirishima, Takaaki Goto, and Kensei Tsuchida*  
(Virtual presentation)

Customer Segmentation using Credit Card Data Analysis
*Saikat Raj, Surajit Jana, Soumyadip Roy, Santanu Roy, Takaaki Goto and Soumya Sen*  
(Virtual presentation)

Scientific Organization of Blood Donation Camp Through Lexicographic Optimization and Taxicab Path Computation
*Partha Ghosh, Takaaki Goto, Leena Jana Ghosh and Soumya Sen*  
(Virtual presentation)
A Statistical Method for API Usage Learning and API Misuse Violation Finding
Deepak Panda, Piyush Basia, Kushal Nalavolu, Xin Zhong, Harvey Siy and Myoungkyu Song
(Virtual presentation)

Commit Message Can Help: Security Patch Detection in Open Source Software via Transformer
Fei Zuo, Xin Zhang, Yuqi Song, Junghwan Rhee and Jicheng Fu

On Effectiveness of GAN-Based Denoising Techniques for Adversarial Face Images
Turhan Kimbrough, Pu Tian, Weixian Liao and Wei Yu

ProvSec: Provenance Tracking Cybersecurity Benchmark Dataset
Madhukar Shrestha, Yonghyun Kim, Jeehyun Oh, Junghwan Rhee, Yung Ryn Choe, Fei Zuo, Myung-Ah Park and Gang Qian

RUST Unsafe Region Targets Directed Greybox Fuzzing (Poster)
Donhyeon Yu and Yuseok Jeon

Membership Inference Attack with a Distance-based Contrastive Approach (Poster)
Nozima Murodova and Hyungjoon Koo
10:20 AM – 12:40 PM – Special Session B9-1:
Theory and Application for Advanced Software System
Chair: Dr. Yeong-Tae Song (Towson University)

Orchestrating Apache NiFi/MiNiFi within a Spatial Data Pipeline
Chase Carthen, Araam Zaremehrjardi, Vinh Le, Alireza Tavakkol, Frederick C. Harris Jr., Sergiu Dascalu, Carlos Cardillo, Scotty Strachan
(Virtual presentation)

Measuring the Effects of Signal-To-Noise in EEG Emotion Recognition
Zachary Estreito, Vinh Le, Frederick C. Harris Jr., Sergiu Dascalu
(Virtual presentation)

Mobile Augmented Reality System for Emergency Response
Sharad Sharma

Realistic Predictors for Regression and Semantic Segmentation
Krishna Chaitanya Gadepally, Sambandh Bhusan Dhal, Stavros Kalafatis and Kevin Nowka
(Session A4: Code Analysis), (Virtual presentation)

10:20 AM – 12:40 PM –
Special Session B9-2: Information Technology for Social and Business Fields
Chair: Dr. Motoi Iwashita (Chiba Institute of Technology, Japan) – Remote hosting

Mobile User Analysis Considering Collaboration with Financial Services
Ken Nishimatsu, Akiya Inoue
(Virtual presentation)

Study on Emissions of Environmental Impact in Chemical Industry
Yohei Hara, Hiroyuki Ono
(Virtual presentation)

Operation Management Method of Software Defined Perimeter for Promoting Zero-Trust Model
Shigeaki Tanimoto, Sogen Hori, Hiroyuki Sato and Atsushi Kanai
(Virtual presentation)

Develop a System to Analyze Logs of a Given System Using Machine Learning
Md. Tarek Hasan and Mahady Hasan
(Session A7: Potpourri)

12:40 – 12:45 PM – Closing Remark