



Cyber Physical Systems and Deep Learning

Chicago, Illinois
November 5-7, 2018

Conference Program

Organizing Committee

General Conference Chair

Cihan H. Dagli

Missouri University of Science and Technology, USA

Committee Members

Nil Kilicay-Ergin

Pennsylvania State University, USA

Fred Highland

University of Maryland, USA

Nevrez Imamoglu

National Institute of Advanced Industrial Science and Technology, Japan

Lakshmanan Meyyappan

Regions Bank, USA

Iveta Mrázová

Charles University, Czech Republic

Ahmet Murat Ozbayoglu

TOBB University of Economics and Technology, Turkey

Mika Sato-Ilic

University of Tsukuba, Japan

Abdulhamit Subasi

Effat University, Saudi Arabia

Gürsel A. Süer

Ohio University, USA

Zeyi Sun

Missouri University of Science and Technology, USA

Huy T. Tran

University of Illinois - Urbana Champaign, USA

Conference Support

provided by Missouri S&T

Sue Turner, Conference Coordinator

Rebecca Frisbee | Gavin Michael Jewell

Conference Marketing/Graphic Design

Welcome to the 8th Annual Complex Adaptive Systems Conference

Through technical research paper presentations and plenary talks from the international research community, participants continue to disseminate current research and application efforts in this area. We welcome you to this year's conference and appreciate your participation.

Cyber physical systems are being developed at different maturity levels all around us. Integration in manufacturing industry and creation of a distributed product design and production capability is evolving globally every day through Manufacturing 4.0 initiatives. Recently, we started discussion about Society 5.0 as a new digital integration trend in evolving cyber physical system as we build smart cities and as our living behavior in a society changes as a result of digital economy and integration. Complex adaptive system architecting and machine learning that can help to provide autonomy for cyber physical systems are the areas that will help greatly in achieving Society 5.0 capability.

I would like to express my gratitude to the plenary speakers at the conference for their invaluable contributions through their presentations. Further, I wish to express my gratitude to all authors for their contributions to the 8th volume of this conference proceedings series and for their presentations at the conference, as well as, to all referees for their technical expertise, comments and suggestions provided during paper reviews. I would like to mention our appreciation to the conference sponsors for bringing real life dimension, issues and engineering problems to the meeting.



Cihan H. Dagli, Ph.D.

Conference Chair
Professor
Engineering Management and Systems Engineering
Director of S&T's Systems Engineering Graduate Program
INCOSE and IIE Fellow
International Journal of General Systems
Intelligent Systems Area Editor
dagli@mst.edu

Conference organized by

Professional and Continuing Education

Missouri University of Science and Technology
216 Centennial Hall, 300 W. 12th St.
Rolla, MO 65409-1560
Phone: (573) 341-6222

pce@mst.edu | pce.mst.edu



Conference Schedule at a Glance

Detailed schedule starts on page 9

Monday, November 5, 2018

7:30 a.m. – 5:30 p.m.

Registration Desk Open (Chicago Boardroom)

7:30 a.m. – 8:30 a.m.

Continental Breakfast (Ontario A)

8:00 a.m. – 9:00 a.m.

Opening Session (Ontario B)

Welcoming Remarks

Keynote Presentation:

New Generation of System Properties
in System of Systems Engineering

Speaker: Nil Kilicay-Ergin

9:00 a.m. – 10:45 a.m.

Session I (Ontario B)

Cyber Physical Systems I

Session Chair: Leonard Petnga

10:45 a.m. – 11:00 a.m.

Morning Break (Ontario A)

11:00 a.m. – 12:45 p.m.

Session II (Ontario B)

Deep Learning and Data Analysis I

Session Chair: Gene Lesinski

12:45 p.m. – 1:45 p.m.

Luncheon & Presentation (Ontario A)

System of System Architecture for Cyber
Security: Fraud Investigation Tracking &
Monitoring Architecture (FITMA)

Speaker: Siddhartha Agarwal

1:45 p.m. – 3:30 p.m.

Session III (Ontario B)

Cluster Analysis and Prediction I

Session Chair: Gürsel A. Süer

3:30 p.m. – 3:45 p.m.

Afternoon Break (Ontario A)

3:45 p.m. – 5:30 p.m.

Session IV (Ontario B)

Deep Learning and Data Analysis II

Session Chair: Nevrez Imamoglu

Tuesday, November 6, 2018

8:00 a.m. – 5:00 p.m.

Registration Desk Open (Chicago Boardroom)

8:00 a.m. – 9:00 a.m.

Continental Breakfast (Ontario A)

9:00 a.m. – 10:00 a.m.

Opening Session (Ontario B)

Keynote Presentation:

Cyber-Physical Sensing, Modeling
and Control with Augmented Reality
for Smart Manufacturing Workforce
Training and Operations Management

Speaker: Zhaozheng Yin

10:00 a.m. – 10:15 a.m.

Morning Break (Ontario A)

10:15 a.m. – 12:00 p.m.

Session V (Ontario B)

Cluster Analysis and Prediction II

Session Chair: Hamid R. Darabi

12:00 p.m. – 1:30 p.m.

Luncheon & Presentation (Ontario A)

Self-Learning Models for Real-Time Marketing

Speaker: Lakshmanan Meyyappan

1:30 p.m. – 3:15 p.m.

Session VI (Ontario B)

Cyber Physical Systems II

Session Chair: Chandru Mirchandani

3:15 p.m. – 3:30 p.m.

Afternoon Break (Ontario A)

3:30 p.m. – 5:15 p.m.

Session VII (Ontario B)

Cluster Analysis and Prediction III

Session Chair: Mika Sato-Ilic

6:00 p.m. – 9:00 p.m.

Awards Banquet & Presentation (Ontario A)

Construction of a Cyber Physical System
Based on Geospatial Information and Its
Applications

Speaker: Nevrez Imamoglu

Wednesday, November 7, 2018

8:00 a.m. – 12:00 p.m.

Registration Desk Open (Chicago Boardroom)

8:00 a.m. – 9:00 a.m.

Continental Breakfast (Ontario A)

9:00 a.m. – 10:45 a.m.

Session VIII (Ontario B)

Cyber Physical Systems III

Speaker: Nil Kilicay-Ergin

10:45 a.m. – 11:00 a.m.

Morning Break (Ontario A)

11:00 a.m. – 12:45 p.m.

Session IX (Ontario B)

Deep Learning and Data Analysis III

Session Chair: Gürsel A. Süer

12:45 p.m.

Closing Remarks

Conference Adjourns

Conference Morning Keynote Speaker

Monday, November 5, 2018 | 8:00 a.m. – 9:00 a.m. | Ontario B

New Generation of System Properties in System of Systems Engineering



Nil Kilicay-Ergin, Ph.D.

Associate Professor
Systems Engineering
Pennsylvania State University, USA

Abstract: Value delivery of engineering systems has evolved throughout the centuries. In recent years, new generation of system properties (also known asilities) emerged as a result of increased complexity of systems that are comprised of various technological, human, and natural components. For example, resilience in large scale infrastructures is a system property that has emerged as a response to observed cascading failures in networked systems. Adaptability, the ability to adapt to changing environments throughout the lifecycle of a system has emerged from instability and uncertainties in design and operating environments. Agility, another related system property emerged as a response to fiercely competitive product development environments. All these properties are systemic and provide value to stakeholders in the presence of uncertainties in design and operating environments.

This talk provides an overview of some of these new generation of system properties and what they mean in the context of complex engineering system design and system of systems engineering. Challenges of measuring and verifying these properties will be addressed and the role of model-based systems engineering will be presented with references to complex engineering system examples.

Biography:

Nil Kilicay-Ergin, Ph.D., is Associate Professor of Systems Engineering at Penn State University's School of Graduate Professional Studies. Prior to joining Penn State University, she worked as a Research Assistant Professor within the Research Institute for Manufacturing and Engineering Systems (RIMES) at the University of Texas at El Paso where she taught for the systems engineering graduate program and served on industry-funded research contracts. She was also a Postdoctoral Fellow at Missouri University of Science and Technology. Nil Ergin received her Ph.D. in Systems Engineering and M.S. in Engineering Management from Missouri University of Science and Technology. She also holds a bachelor's degree in Environmental Engineering from Istanbul Technical University, Turkey. Her research interests include model-based systems engineering, system of systems engineering, complex adaptive systems, and multi-agent systems. She is also a researcher at the DoD-Systems Engineering Research Center (SERC), a federally funded University Affiliated Research Center. She is a member of INCOSE (International Council on Systems Engineering).

Conference Luncheon Keynote Speaker

Monday, November 5, 2018 | 12:45 p.m. – 1:45 p.m. | Ontario B

System-of-System Architecture for Cyber Security: Fraud Investigation Tracking & Monitoring Architectures (FITMA)



Siddhartha Agarwal, Ph.D.

Manager for Global
Risk Management
Asurion, USA

Abstract: Reputation of Enterprises as well as security and safety of digital customers are under attack from the web as the frequency and severity of the resulting breaches continues to intensify. With the digital revolution taking over the globe, our risk in payments, insurance, loans, and identity thefts increases exponentially. The objective is to present an overview of SoS Architecture for Cyber Security called Fraud Investigation Tracking & Monitoring Architecture (FITMA). This SoS architecture is applicable to many domains such as financial institutions, insurance organizations, social networking websites and e-commerce platforms. The different constituent systems of this architecture can be grouped into specific capabilities such as External Vendor based Models, Deep Learning models, Fraud Analysts (human interface). The idea is to use the right set of systems from each capability type to form the best Cyber Physical System for preventing a cyber attack, fraud transaction, application or claim. The Key performance metrics of such an architecture should be vendor neutral, have open coding standards, in addition it maximizes resilience, interoperability, scalability, and reusability.

Biography:

Siddhartha Agarwal, Ph.D., is currently a Manager for Global Risk Management with Asurion, headquartered in Nashville. He has over seven years of experience in machine learning and systems architecting. He has previously worked with Discover Financial Services in Risk Management and Fraud Strategies. He has also worked for Steel Authority of India Ltd in Production Analytics. He is an accomplished performer with comprehensive blend of hands-on professional and academic experience. He is an Artificial Intelligence expert who is passionate about the potential and impact of Data Mining and its applications ranging from Supply Chain Engineering and Financial Risk Management to Cyber Network Security. Dr. Agarwal received the BTech degree from Indian Institute of Technology in 2006, and the M.S. in Mining Engineering from the University of Alaska, Fairbanks in 2010. He earned his Ph.D. in Systems Engineering from Missouri University of Science & Technology in 2015. He is a 2014 INOCSE doctoral award winner for promising research in Systems Engineering.

Conference Morning Keynote Speaker

Tuesday, November 6, 2018 | 9:00 a.m. – 10:00 a.m. | Ontario B

Cyber-Physical Sensing, Modeling and Control with Augmented Reality for Smart Manufacturing Workforce Training and Operations Management



Zhaozheng Yin, Ph.D.

Associate Professor
Computer Science
Missouri University of Science
and Technology, USA

Abstract: Smart manufacturing integrates information, technology, and human ingenuity to inspire the next revolution in the manufacturing industry. Manufacturing has been identified as a key strategic investment area by the U.S. government, private sector, and university leaders to spur innovation and keep America competitive. However, the lack of new methodologies and tools is challenging continuous innovation in the smart manufacturing industry. This project supports fundamental research to develop a cyber-physical sensing, modeling, and control infrastructure, coupled with augmented reality, to significantly improve the efficiency of future workforce training, performance of operations management, safety and comfort of workers for smart manufacturing. Results from this research are expected to transform the practice of worker-machine-task coordination and provide a powerful tool for operations management. This research involves several disciplines including sensing, data analytics, modeling, control, augmented reality, and workforce training and will provide unique interdisciplinary training opportunities for students and future manufacturing engineers.

Biography:

Zhaozheng Yin, Ph.D., received his Ph.D. in Computer Science and Engineering from Pennsylvania State University in 2009. After two-year postdoc training at Carnegie Mellon University, he joined Missouri University of Science and Technology as a faculty member in 2011. He has been appointed as a Daniel St. Clair Fellow in the Computer Science Department since 2015, and a Dean's Scholar in the College of Engineering and Computing since 2016. His group has published 80 papers in computer science conferences and journals including a few best paper awards in CVPR, MICCAI and IJSE. He received NSF CAREER award in 2014 and served as an Area Chair of MICCAI2015, CVPR2017, WACV (2016, 2018 and 2019).

Conference Luncheon Keynote Speaker

Tuesday, November 6, 2018 | 12:00 p.m. – 1:30 p.m. | Ontario B

Self-Learning Models for Real-Time Marketing



Lakshmanan Meyyappan, Ph.D.

Senior Vice President, Analytics
Department in Corporate Marketing
Regions Financial Corp, USA

Abstract: This talk will provide an overview of the journey and the approach taken by the Regions Marketing group to make self-learning models for real-time marketing a reality. Additionally, the talk will provide an overview of the variety of machine learning available to all of us and why knowing what algorithm to choose for which problem, the domain knowledge, product owner approvals, cross functional collaboration and measurements, are more important than the algorithm itself.

You expect a bank to care about money, checking and savings, CDs and IRAs. But what about the person behind the money? Shouldn't you be a big deal in the whole banking equation? At Regions, we know a savings account, isn't just a savings account—it's a wedding, or a college education or even a taco Tuesday. With our people, our tech and our tools, we make your life easier, because we get it. Some things are bigger than banking. With this in mind, we have developed and are constantly improving our smart decision systems capable of enhancing a customer's experience in a contextually-aware manner, across multiple channels, delivering relevant and personalized next best actions. Market smarter, not harder!

Biography:

Lakshmanan Meyyappan, Ph.D., is currently working as a Senior Vice President, heading the Analytics Department in Corporate Marketing at the Regions Financial Corp. He has 15+ years of industry and research experience in the field of advanced data analytics. Prior to joining Regions Financial Corp., he worked as the Enterprise Analytics Manager at Caterpillar Inc., where he worked for a little over 11 years at various global locations, including United States, the U.K., and India. He is a strategic thought leader who has progressively grown and successfully worked in the roles of strategy development & implementation, people management, program/portfolio management, off-shore data analysis team development, Six Sigma Black Belt, project management, systems engineer, and a software architect. Prior to joining Caterpillar, he worked as a Post Doctoral Fellow at Missouri University of Science and Technology with focus on Artificial Intelligence. He graduated with a Ph.D. in Engineering Management & Systems Engineering (dissertation in Agent-Based Systems) and a Master's degree in Computer Engineering from Missouri S&T.

Conference Banquet Speaker

Tuesday, November 6, 2018 | 6:00 p.m. – 9:00 p.m. | Ontario B

Construction of a Cyber Physical System Based on Geospatial Information and Its Applications



Nevrez Imamoglu, Ph.D.

National Institute of Advanced Industrial Science and Technology, Japan

Abstract: Recently in Japan, the concept or use of cyber physical systems is moving more from Industry 4.0 and Society 4.0 (current information society where human reach information on cyberspace and analyze it for applications in physical space) to the concept of Society 5.0 (e.g. autonomous cars, AI based diagnosis or decisions using bigdata, fully robot based automation, automated scientific experiments, etc.) with the rapid development on data collection, networking, and AI for information analysis and description. As a part of this movement, the Artificial Intelligence Research Center (AIRC) at National Institute of Advanced Industrial Science and Technology (AIST) is also involved in this movement by trying to develop a dynamic Cyber Physical System with the idea of 4D modeling for smart-cities and smart-society. To achieve this, AIRC members at AIST have been collecting and using large scale of data from various sensory information and domains (ground, aerial, and satellite observations). In this talk, examples of current developments and achievements at AIRC for the Construction of a Cyber Physical System based on Geospatial Information with its Applications will be given.

Biography:

Nevrez Imamoglu, Ph.D., is working at the Artificial Intelligence Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tokyo, Japan, since April 2016. Before joining AIST, he joined RIKEN Brain Science Institute as a Research Scientist and JSPS Foreign Postdoctoral Fellow. He also worked as Research Associate at School of Computer Engineering, Nanyang Technological University, Singapore. He received his Ph.D. from the Department of Medical Systems Engineering, Chiba University. He obtained his master's degree in Electrical and Electronics Engineering from TOBB University of Economics and Technology, Ankara, Turkey. He also holds double major bachelor's degrees in Computer Engineering and Electronics & Communication Engineering, Cankaya University, Ankara, Turkey. His research interests include computer vision, signal/image processing, pattern recognition, assisting technologies, and intelligent systems.

Conference Schedule

Monday Morning, November 5, 2018 *Presentations are noted by corresponding page number in proceedings.*

7:30 a.m. — 5:30 p.m.

Registration Desk Open | Chicago Boardroom

7:30 a.m. — 8:30 a.m.

Continental Breakfast | Ontario A

8:00 a.m. — 9:00 a.m.

Opening Session

Welcoming Remarks & Keynote Presentation | Ontario B



New Generation of System Properties in System of Systems Engineering

Keynote Speaker:

Nil Kilicay-Ergin, Pennsylvania State University, USA *abstract and bio details on page 4*

9:00 a.m. — 10:45 a.m.

Session I:

Cyber Physical Systems I | Ontario B

Session Chair: Leonard Petnga, University of Alabama-Huntsville, USA

4 - Systems Engineering Design: Architecting Trustworthiness in Cyber Physical Systems Using an Extended Aggregated Modality

Brian Connett, Bryan O'Halloran (U.S. Naval Postgraduate School, USA)

13 - Non-Commutativity, Incompatibility, Emergent Behavior and Decision Support Systems

Mustafa Canan (Naval Postgraduate School, USA)

21 - Conceptual Modeling of Cyber-Physical Gaps in Air Traffic Control

Yaniv Mordecai (Holon Institute of Technology, Israel)

29 - System of Systems Architecting Problems: Definitions, Formulations, and Analysis

Hadi Farhangi (Savannah State University, USA);
Dincer Konur (Texas State University, USA)

37 - Space-based Collision Avoidance Framework for Autonomous Vehicles

Jinke Yu, Leonard Petnga (University of Alabama in Huntsville, USA)

10:45 a.m. — 11:00 a.m.

Morning Break | Ontario A

11:00 a.m. — 12:45 p.m.

Session II:

Deep Learning and Data Analysis I | Ontario B

Session Chair: Gene Lesinski, US Military Academy, West Point, USA

179 - DenseNet for Anatomical Brain Segmentation

Ram Deepak Gottapu, Cihan H. Dagli (Missouri S&T, USA)

186 - Anomaly Detection and Classification in Cellular Networks Using Automatic Labeling Technique for Applying Supervised Learning

S M Abdullah Al Mamun, Juha Valimaki (TTG International Ltd, Turkey)

196 - Multi-objective Evolutionary Neural Network to Predict Graduation Success at the United States Military Academy

Gene Lesinski (United States Military Academy, USA);
Steven Corns (Missouri S&T, USA)

206 - Learning from Experience: An Automatic pH Neutralization System Using Hybrid Fuzzy System and Neural Network

Ethar H. K. Alkamil (Missouri S&T, USA; University of Basrah, Iraq); Seaar Al-Dabooni (Basrah Oil Company, Iraq; Applied Computational Intelligence Laboratory, USA); Ahmed K. Abbas (Missouri S&T, USA; Iraqi Drilling Company, Iraq); Ralph Flori (Missouri S&T, USA); Donald C. Wunsch II (Applied Computational Intelligence Laboratory, USA; Missouri S&T, USA);

216 - Benchmarking Supervised Learning Frameworks for Engineering Highly Scalable Intelligent Systems

Om Narayan, Munaf Arshad Qazi, Raman Kannan (Tandon School of Engineering, NYU, USA)

Conference Schedule

Monday Afternoon, November 5, 2018 *Presentations are noted by corresponding page number in proceedings.*

12:45 p.m. – 1:45 p.m.

Lunch & Keynote Presentation | Ontario A



**System-of-System Architecture for Cyber Security:
Fraud Investigation Tracking & Monitoring Architecture (FITMA)**

Keynote Speaker:

Siddhartha Agarwal, Asurion, USA *abstract and bio details on page 5*

1:45 p.m. – 3:30 p.m.

**Session III:
Cluster Analysis and Prediction I** | Ontario B

Session Chair: Gürsel A. Süer, Ohio University, USA

351 - Selection of Assembly Systems; Assembly Lines vs. Seru Systems

Aaya Aboelfotoh, Gürsel A Süer, Md Abdullah (*Ohio University, USA*)

359 - Multidimensional Kernel Principal Component Analysis of False Alarms of Rapidly Intensifying Atlantic Tropical Cyclones

Andrew Mercer, Alexandria Grimes, Kimberly Wood (*Mississippi State University, USA*)

367 - Astronomical Knowledge Discovery of Very Faint Galaxies

María José Márquez, Tamás Budavari, Luis Manuel Sarro (*EUMETSAT, Germany*)

376 - Learning to Operate an Excavator via Policy Optimization

Benjamin J. Hodel (*Caterpillar Inc., USA*)

383 - Predicting the Future with Artificial Neural Network

Anifat Olawoyin, Yangjuin Chen (*University of Winnipeg, Canada*)

3:30 p.m. – 3:45 p.m.

Afternoon Break | Ontario A

3:45 p.m. – 5:30 p.m.

**Session IV:
Deep Learning and Data Analysis II** | Ontario B

Session Chair: Nevrez Imamoglu, National Institute of Advanced Industrial Science and Technology, Japan

134 - Unsupervised Learning of Polychronous Wavefront Computation Configurations for Pattern Recognition

Fred Highland (*University of Maryland Baltimore County, USA*)

144 - Unsupervised Machine Learning by Graph Analytics on Heterogeneous Network Device Data

Jeffery S. Lin, Erhan Guven, Lien T. Duong, Matthew D. Dinmore, Paul A. Hanke, Beth G. Magem, Jeffery S. Chavis (*John Hopkins University, USA*)

152 - Adversarial Attacks and Defenses Against Deep Neural Networks: A Survey

Mesut Ozdag (*University of Central Florida, USA*)

162 - Exploring Recurrent and Feedback CNNs for Multi-Spectral Satellite Image Classification

Nevrez Imamoglu, Pascual Martínez-Gómez, Ryuhei Hamaguchi, Ken Sakurada, Ryouyusuke Nakamura (*National Institute of Advanced Industrial Science and Technology (AIST), Japan*)

170 - Customer Perception Analysis Using Deep Learning and NLP

Sridhar Ramaswamy, Natalie DeClerck (*Caterpillar Inc., USA*)

Conference Schedule

Tuesday Morning, November 6, 2018 *Presentations are noted by corresponding page number in proceedings.*

8:00 a.m. — 5:00 p.m.
Registration Desk Open | Chicago Boardroom

8:00 a.m. — 9:00 a.m.
Continental Breakfast | Ontario A

9:00 a.m. — 10:00 a.m.
Opening Session
Keynote Presentation | Ontario B



Cyber-Physical Sensing, Modeling and Control with Augmented Reality for Smart Manufacturing Workforce Training and Operations Management

Keynote Speaker:

Zhaozheng Yin, Missouri University of Science and Technology, USA *abstract and bio details on page 6*

10:00 a.m. — 10:15 a.m.
Morning Break | Ontario A

10:15 a.m. — 12:00 p.m.
Session V:
Cluster Analysis and Prediction II | Ontario B

Session Chair: **Hamid R. Darabi**, Remedy Partners Inc., USA

306 - Forecasting Mortality Risk for Patients Admitted to Intensive Care Units Using Machine Learning
 Hamid R. Darabi, Daniel Tsinis, Kevin Zecchini, Winthrop F. Whitcomb, Alexander Liss (*Remedy Partners Inc., USA*)

314 - Near Field Communication Detection System for Drug-Drug Interactions
 Amjed B. H. Altaweel (*Al-Nahrain University, Iraq*); Loay Abusalah, Dima M. Qato (*University Of Illinois at Chicago, USA*)

324 - Using Accuracy Measure for Improving the Training of LSTM with Metaheuristic Algorithms
 Tarik A. Rashid, Polla Fattah (*University of Kurdistan Hewler, Iraq*; Salahaddin University-Erbil, Iraq); Delan K. Awla (*University of Kurdistan Hewler, Iraq*)

334 - Analysis of Parkinson's Disease Data
 Ram Deepak Gottapu | Cihan H. Dagli (*Missouri S&T, USA*)

342 - Robust Virtual Welding Process Optimization
 Vijay K. Yalamanchili, Diego A. Galindo, Justin C. Mach (*Caterpillar Inc., USA*)

12:00 p.m. — 1:30 p.m.
Lunch & Keynote Presentation | Ontario A



Self-Learning Models for Real-Time Marketing

Keynote Speaker:

Lakshmanan Meyyappan, Regions Bank, USA *abstract and bio details on page 7*

Conference Schedule

Tuesday Afternoon/Evening, November 6, 2018 *Presentations are noted by corresponding page number in proceedings.*

1:30 p.m. — 3:15 p.m.

Session VI: Cyber Physical Systems II | Ontario B

Session Chair: Chandru Mirchandani, George Washington University, USA

87 - Text Mining to Understand the Influence of Social Media Applications on Smartphone Supply Chain

Aditya Akundi, Bill Tseng (*University of Texas at El Paso, USA*);
Jiamin Wu (*Shantou University, China*); Eric Smith, Subbalakshmi M,
Francisco Aguirre (*University of Texas at El Paso, USA*)

95 - Social Media Analysis of User's Responses to Terrorism Using Sentiment Analysis and Text Mining

Samah Mansour (*Grand Valley State University, USA*)

104 - Sensor Based Human Activity Recognition Using Adaboost Ensemble Classifier

Abdulhamit Subasi, Dalia H. Dammas, Rahaf D. Alghamdi, Raghad A. Makawi, Eman A. Albiety, Tayeb Brahimi, Akila Sarirete (*Effat University, Saudi Arabia*)

112 - Visualizing High Dimensional and Big Data

Amy Genender-Feltheimer (*Caterpillar Inc., USA*)

122 - Adaptive Software Reliability Growth

Chandru Mirchandani (*George Washington University, USA*)

3:15 p.m. — 3:30 p.m.

Afternoon Break | Ontario A

3:30 p.m. — 5:15 p.m.

Session VII: Cluster Analysis and Prediction III | Ontario B

Session Chair: Mika Sato-Ilic, University of Tsukuba, Japan

269 - Homogeneous Cluster Analysis

Mika Sato-Ilic (*University of Tsukuba, Japan*)

276 - Evolutionary Clustering Algorithms for Relational Data

Amit Banerjee, Issam Abu-Mahfouz (*Pennsylvania State University, USA*)

284 - Asymmetric MDS with Categorical External Information Based on Radius Model

Kensuke Tanioka (*Wakayama Medical University, Japan*);
Hiroshi Yadohisa (*Doshisha University, Japan*)

292 - An Application Study of DNA Structural Properties for Promoter Prediction with Wavelet and Support Vector Machine

Makihiko Sato (*Maebashi Institute of Technology, Japan*)

298 - Real-Time Classification of Earthquake Using Deep Learning

H. Serdar Kuyuk, Ohno Susumu (*Tohoku University, Japan*)

6:00 p.m. — 9:00 p.m.

Awards Banquet & Presentation | Ontario A



Construction of a Cyber Physical System Based on Geospatial Information and Its Applications

Keynote Speaker:

Nevrez Imamoglu, National Institute of Advanced Industrial Science and Technology, Japan

abstract and bio details on page 8

Conference Schedule

Wednesday Morning, November 7, 2018 *Presentations are noted by corresponding page number in proceedings.*

8:00 a.m. — 12:00 p.m.

Registration Desk Open | Chicago Boardroom

8:00 a.m. — 9:00 a.m.

Continental Breakfast | Ontario A

9:00 a.m. — 10:45 a.m.

**Session VIII:
Cyber Physical Systems III** | Ontario B

Session Chair: Nil Kilicay-Ergin, Pennsylvania State University, USA

46 - Ranking Critical Activities in Process Architectures

Satish M. Srinivasan, Nil Kilicay-Ergin, Raghvinder S. Sangwan,
Colin J. Neill (*Pennsylvania State University, USA*)

56 - A Three-Choice Minority Game Model with Homogeneous Agent Preferences for Resource Allocation

Catalina A. Montes, Adrian Roy L. Valdez (*Scientific Computing Laboratory, University of the Philippines-Diliman, Philippines*)

64 - Anomaly Detection in Vehicle Traffic with Image Processing and Machine Learning

Selim S. Sarikan, A. Murat Ozbayoglu (*TOBB University of Economics and Technology, Turkey*)

70 - DSRC Based Sensor-Pooling Protocol for Connected Vehicles in Future Smart Cities

Mostafa El-Said, Samah Mansour, Vijay Bhuse
(*Grand Valley State University, USA*)

79 - Solving Stochastic Shortest Distance Path Problem by Using Genetic Algorithms

Ehsan Ahmadi, Gürsel A. Süer, Farah Al-Ogaili (*Ohio University, USA*)

10:45 a.m. — 11:00 a.m.

Morning Break | Ontario A

11:00 a.m. — 12:45 p.m.

**Session IX:
Deep Learning and Data Analysis III** | Ontario B

Session Chair: Gürsel A. Süer, Ohio University, USA

223 - Effect of Flash Stimulation for Migraine Detection Using Decision Tree Classifiers

Abdulhamit Subasi | Aysha Ahmed (*Effat University, Saudi Arabia*);
Emina Alickovic (*Linköping University, Sweden*)

230 - Automated EMG Signal Classification for Diagnosis of Neuromuscular Disorders Using DWT and Bagging

Abdulhamit Subasi (*Effat University, Saudi Arabia*);
Emine Yaman (*International University of Sarajevo, Bosnia and Herzegovina*);
Yara Somaily, Halah A. Alynabawi, Fatemah Alobaidi, Sumaiah Altheibani
(*Effat University, Saudi Arabia*)

238 - Real-time Detection of Human Falls in Progress: Machine Learning Approach

Gursel Serpen, Rakibul Hasan Khan (*University of Toledo, USA*)

248 - The 2015-2017 Cape Town Drought: Attribution and Prediction Using Machine Learning

Michael B. Richman (*University of Oklahoma, USA*);
Lance M. Leslie (*University of Technology Sydney, Australia*)

258 - Surface Roughness Prediction in Turning Using Three Artificial Intelligence Techniques; A Comparative Study

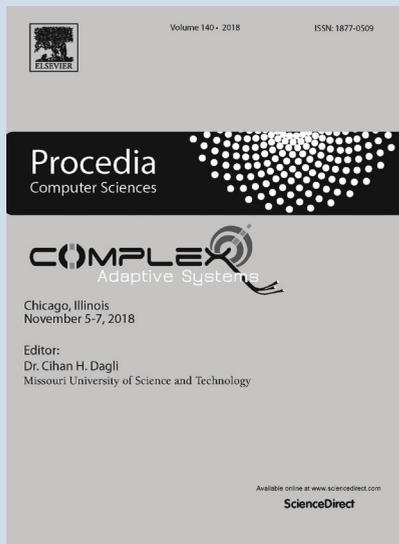
Issam Abu Mahfouz, AHM Esfakur Rahman, Amit Banerjee
(*Penn State University Harrisburg, USA*)

393 - Early Detection of Disease Using Electronic Health Records and Fisher's Wishart Discriminant Analysis

Sijia Yang | Licheng Wang (*Beijing Univ. of Posts and Telecommunications, China*);
Jian Bian, Zeyi Sun, Haoyi Xiong, Yu Li (*Missouri S&T, USA*);
Haojin Zhu (*Shanghai Jiaotong University, China*)

12:45 p.m.

Closing Remarks & Conference Adjourns



Proceedings

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