Welcome

The 7th Annual Complex Adaptive Systems Conference, through technical research paper presentations and plenary talks from the international research community, continues 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 (CPS) are multi-faceted systems of the future, entailing complex logic with many levels of reasoning in intricate arrangements. They need to be engineered and operated evolutionarily through a web of connections demonstrating adaptability. This is changing the engineering research themes and methods drastically.

Modelling and simulation of CPS has become a very important area of research. The need for test beds for ensuring interoperability between CPS and for verification either of models or of the CPS themselves, inclusion of human factors in modelling and simulation, open framework for model interoperability, incorporation of security architectural features into models, combining formal verification and simulation technology, an evolutionary approach to testing and evaluation of adaptive and resilient CPS, and big-data analytics modelling via machine learning have recently been identified as fundamental research themes.

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 7th volume of 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.
## Conference Schedule at a Glance

### Monday, October 30, 2017

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<th>Time</th>
<th>Event</th>
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<tr>
<td>7:30 a.m.</td>
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<td>Session Chair: Walker Land</td>
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### Wednesday, November 1, 2017

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<td>Technical Session VI (General) (Ontario B)</td>
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<td>Risk in Complex Systems</td>
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<td>Session Chair: Davinia Rizzo (Ontario B)</td>
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<td>Morning Break (Ontario A)</td>
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<td>Technical Sessions VII (General) (Ontario B)</td>
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<td>Complex System Architecting</td>
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<td>Session Chair: Chandra Mirchandani (Ontario B)</td>
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<td>Computational Intelligence Models for Intelligent Transportation Systems</td>
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<td>Session Chair: Omer Berat Sezer (Ontario C)</td>
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<td>Luncheon &amp; Afternoon Plenary Session (Ontario A)</td>
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<td>Quality-driven Reference Architecture Incremental Design: An Industrial Experience</td>
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<td>Speaker: Nicole Levy</td>
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<td>Technical Sessions VIII (General) (Ontario B)</td>
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<td>6:30 p.m. – 9:00 p.m.</td>
<td>Banquet &amp; Awards (Ontario A)</td>
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</tbody>
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Full schedule starts on page 5
Conference Morning Plenary Speaker
Monday, October 30, 2017 | 8:00 a.m. – 9:00 a.m. | Ontario B

Modeling New Complex Data Structures

Abstract: As the world advances towards a new era of innovative information within the frame of Cyber Physical Systems, data analysts are under pressure to interpret the unprecedentedly complex and massive data observed. This new complex data structure calls for the development of a methodology for innovative data analysis to extract the efficient latent structure of the data. In the methodology of data analysis, measuring, quantifying, and fusing data are essential; therefore, “space” and “scale” play an essential role in analyzing data. It is from these two perspectives of “space” and “scale” that this presentation will introduce methodologies of data analyses for adapting complex data structures.

Biography:

Mika Sato-Ilic, Ph.D., currently holds the position of Professor in the Faculty of Engineering, Information and Systems, at the University of Tsukuba, Japan. She also holds the position of Vice President in the National Statistics Center, Japan. She is the founding Editor-in-Chief of the International Journal of Knowledge Engineering and Soft Data Paradigms, Associate Editor of IEEE Transactions on Fuzzy Systems, Neurocomputing, Information Sciences, and Regional Editor of International Journal on Intelligent Decision Technologies, as well as serving on the editorial board of several other journals. In addition, she was a Council of the International Association for Statistical Computing (a Section of the International Statistical Institute), a Senior Member of the IEEE where she held several positions including the Vice-Chair of the Fuzzy Systems Technical Committee of the IEEE Computational Intelligence Society. In addition, she has served on several IEEE committees including the administration committee, program co-chair, and special sessions co-chair. Her academic output includes four books, 12 book chapters and over 120 journal and conference papers. Her research interests include the development of methods for data mining, multi-dimensional data analysis, multi-mode multi-way data theory, pattern classification, and computational intelligence techniques for which she has received several academic awards.
Conference Schedule
Monday Morning, October 30, 2017  Presentations are noted by corresponding page number in proceedings. Presenters names are underlined.

Registration Desk Open
7:30 a.m. – 5:00 p.m.  
(Chicago Boardroom)

Continental Breakfast
7:30 a.m. – 8:30 a.m.  
(Ontario A)

Opening Plenary Session
8:00 a.m. – 9:00 a.m.  
(Ontario B)

Welcoming Remarks
Modeling New Complex Data Structures
Speaker: Mika Sato-Ilic
Mika Sato-Ilic, Ph.D.  
Professor of Engineering, Information Systems  
University of Tsukuba, Japan
(SPEAKER PROFILE ON PAGE 4)

Technical Session I (General)
9:00 a.m. – 10:30 a.m.

Intelligent Knowledge Based Data Analysis
( Ontario B)

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

216 - Knowledge-based Comparable Predicted Values in Regression Analysis
Mika Sato-Ilic (University of Tsukuba, Japan)

224 - M&MFCM: Fuzzy C-Means Clustering with Mahalanobis and Minkowski Distance Metrics
Natacha Gueorguieva (City University of New York, USA); Iren Valova (University of Massachusetts Dartmouth, USA); George Georgiev (University of Wisconsin Oshkosh, USA)

234 - Partial Least Squares Method for Three-Mode Three-Way Datasets Based on Tucker Model
Jun Tsuchida | Hiroshi Yadohisa (Doshisha University, Japan)

Nijat Mehdiyev | Johannes Lahann | Andreas Emrich | Peter Fettke | Peter Loos (German Research Center for Artificial Intelligence (DFKI) & Saarland University, Germany); David Enke (Missouri University of Science and Technology, USA)

Morning Break
10:30 a.m. – 11:00 a.m.  
(Ontario A)
Using Data Analytics, Computational Modeling, and Embedded Systems to Understand Cities as Complex Systems

Abstract: Urbanization is one of the great challenges and opportunities of this century, inextricably tied to global challenges ranging from climate change to sustainable use of energy and natural resources, and from personal health and safety to accelerating innovation and education. There is a growing science community—spanning nearly every discipline—pursuing research related to these challenges. The availability of urban data has increased over the past few years, in particular through open data initiatives, creating new opportunities for collaboration between academia and local government in areas ranging from scalable data infrastructure to tools for data analytics, along with challenges such as replicability of solutions between cities, integrating and validating data for scientific investigation, and protecting privacy. For many urban questions, however, new data sources will be required with greater spatial and/or temporal resolution, driving innovation in the use of sensors in mobile devices as well as embedding intelligent sensing infrastructure in the built environment. Collectively these data sources also hold promise to begin to integrate computational models associated with individual urban sectors such as transportation, building energy use, or climate. Catlett will discuss the work that Argonne National Laboratory and the University of Chicago are doing in partnership with the City of Chicago and other cities through the Urban Center for Computation and Data, focusing in particular on new opportunities related to embedded systems and experience to date with the Array of Things project in Chicago and partner cities.

Biography:

Charles Catlett, Ph.D., is the founding director of the Urban Center for Computation and Data, UrbanCCD, which brings social, physical, and computational scientists together with artists, architects, technologists, and policy makers to explore science-based approaches to opportunities and challenges related to the understanding, design, and sustainable operation of cities. To this end UrbanCCD brings expertise, tools, and resources to bear from computational modeling, data analytics, and embedded systems. He is also a Senior Computer Scientist at Argonne National Laboratory and a Senior Fellow at the Computation Institute of the University of Chicago and Argonne National Laboratory.

From 2007 to 2011 he was the Chief Information Officer at Argonne National Laboratory, and from 2004 to 2007 he was Director of the National Science Foundation’s TeraGrid initiative—a nationally distributed supercomputing facility involving fifteen universities and federal laboratories. From 1999 to 2004, Charlie directed the design and deployment of I-WIRE, a dedicated fiber optic network funded by the State of Illinois, which connects research institutions in the Chicago area and downstate Illinois to support advanced research and education.
Conference Schedule  
Monday Morning/Afternoon, October 30, 2017

Presentations are noted by corresponding page number in proceedings. Presenters names are underlined.

Registration Desk Open  
7:30 a.m. – 5:00 p.m.  
(Chicago Boardroom)

Technical Sessions II (Concurrent)  
11:00 a.m. – 12:30 p.m.  
(See schedule at right)

Architecting Cyber Physical Systems  
Session Chair: Kathleen Giles  
(Naval Postgraduate School, USA)

4 - Increasing System Failure Analysis Effectiveness Through Architecture Modeling  
S. Alex Rambikur | Kristin Giammarco | Bryan O’Halloran (Naval Post Graduate School, USA)

14 - Establishing Rules for Self-Organizing Systems-of-Systems  
David M. Curry | Cihan H. Dagli (Missouri University of Science and Technology, USA)

57 - Mission-based Architecture for Swarm Composability (MASC)  
Kathleen Giles | Kristin Giammarco (Naval Postgraduate School, USA)

19 - Enabling Flexibility Through Forming and Evolving Systems of Systems  
Walter L. Barnes, II | Cihan H. Dagli | Ruwen Qin (Missouri University of Science and Technology, USA); Ya-nan Song and Rong-hua Xu (Guangdong University of Technology, P.R. China)

Deep Learning Convolution Neural Network Applications  
Session Chair: Fred Highland  
(Ontario C)

Deep Learning Convolution Neural Network Applications  
Session Chair: Fred Highland  
(University of Maryland, USA)

281 - Convolutional Neural Network Based Localized Classification of Uterine Cervical Cancer Digital Histology Images  
Haidar A. Almubarak | R. Joe Stanley (Missouri University of Science and Technology, USA); Rodney Long | Sameer Antani | George Thoma (National Institutes of Health, USA); Rosemary Zuna (University of Oklahoma Health Sciences Center, USA); Shelliane R. Frazier

296 - LPR CNN Cascade and Adaptive Deskewing  
George Abou Kassm | Roger Achkar (American University of Science and Technology, Lebanon)

349 - An Application of Convolutional Neural Networks to Aircraft Ejection Seat Testing  
Kyle Buller (Missouri University of Science and Technology, USA)

304 - Solar Irradiance Forecasting Using Deep Neural Networks  
Ahmad Alzahrani | Pourya Shamsi | Cihan H Dagli | Mehdi Ferdowsi (Missouri University of Science and Technology, USA)
Conference Schedule
Monday Afternoon, October 30, 2017

Presentations are noted by corresponding page number in proceedings. Presenters names are underlined.

Registration Desk Open
7:30 a.m. – 5:00 p.m.
(Chicago Boardroom)

Technical Sessions III (Concurrent)
1:30 p.m. – 3:00 p.m.
(See schedule at right)

Cyber Security
Session Chair: Nichole Levy
(National Conservatory of Arts and Crafts, France)

Cyber Security
Session Chair: Nichole Levy
(Ontario B)

Data Analysis for Complex and High Dimensional Data
Session Chair: Ruwen Qin
(Ontario C)

Afternoon Break
3:00 p.m. – 3:30 p.m.
(Ontario A)

Technical Sessions III (Concurrent)
1:30 p.m. – 3:00 p.m.

Cyber Security
(Ontario B)

Session Chair: Nicole Levy
(National Conservatory of Arts and Crafts, France)

100 - A Threat to Vehicular Cyber Security and the Urgency for Correction
Syed Rizvi | Jonathan Willett | Dante Perino | Seth Marasco | Chandler Condo (Penn State University, USA)

93 - Secure Online Transaction Algorithm: Securing Online Transaction Using Two-Factor Authentication
Joseph Gualdoni | Andrew Kurtz | Ilva Myzyri | Megan Wheeler | Syed Rizvi (Penn State University, USA)

132 - An Outlier-Based Intention Detection for Discovering Terrorist Strategies
Salih Tutun | Mohammad T. Khasawneh (Binghamton University, USA); Murat Akça | Ömer Bıyıklı (Gazi University, Turkey)

126 - High Availability Layers and Failure Recovery Timers for Virtualized Systems and Services
Mehmet Toy (Verizon, USA)

Data Analysis for Complex and High Dimensional Data
(Ontario C)

Session Chair: Ruwen Qin
(Missouri University of Science and Technology, USA)

250 - Learning Curve Analysis Using Intensive Longitudinal and Cluster-Correlated Data
Xiao Zhong | Zeyi Sun | Haoyi Xiong | Md. Monirul Islam (Missouri University of Science and Technology, USA)
Neil Heffernan (Worcester Polytechnic Institute, USA)

258 - Interactive Pattern Discovery in High-Dimensional, Multimodal Data Using Manifolds
Jinhong K. Guo | Martin O. Hofmann (Lockheed Martin Advanced Technology Laboratories, USA)

266 - Crack Detection and Identification Using Vibration Signals and Fuzzy Clustering
Issam Abu-Mahfouz | Amit Banerjee, (Penn State University Harrisburg, USA)

275 - Classification of Rest and Active Periods in Actigraphy Data Using PCA
Isaac W. Muns | Yogesh Lad | Ivan G. Guardiola | Matthew Thimgan (Missouri University Science and Technology, USA)
Conference Schedule
Monday Afternoon, October 30, 2017

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(Chicago Boardroom)

Technical Sessions IV (Concurrent)
3:30 p.m. – 5:00 p.m.
(See schedule at right)

Cyber Social Systems
Session Chair: William P. Fisher
(Ontario B)

Computational Intelligence Applications
Session Chair: Yanan Song
(Ontario C)

Sessions Conclude
5:00 p.m.

Technical Sessions IV (Concurrent)
3:30 p.m. – 5:00 p.m.

Cyber Social Systems
( Ontario B)

Session Chair: William P. Fisher
University of California, Berkeley, USA

139 - Complex Adaptive Behavior of Hybrid Teams
Mustafa Canan | Andres Sousa-Poza | Anthony Dean (Old Dominion University, USA)

149 - Data Swapping for Private Information Sharing of Web Search Logs
Kato Mivule (Norfolk State University, USA)

159 - Point-Of-Interest Recommender System for Social Groups
Ram Deepak Gottapu | Lakshmi Venkata Sriram Monangi (Missouri University of Science and Technology, USA)

165 - A Practical Approach to Modeling Complex Adaptive Flows in Psychology and Social Science
William P. Fisher, Jr. (University of California, Berkeley & LivingCapitalMetrics.com, USA)

Computational Intelligence Applications
( Ontario C)

Session Chair: Yanan Song
Missouri University of Science and Technology, USA

341 - The Application of One-Class Classifier Based on CNN in Image Defect Detection
Mei Zhang | Jinglan Wu | Huifeng Lin | Peng Yuan (South China University of Technology, P.R. China); Yanan Song (Guangdong University of Technology, P.R. China)

288 - ERP Neural Network Inventory Control
Jad Farhat | Michel Owayjan (American University of Science and Technology, Lebanon)

357 - Weighted Evaluation of Wind Power Forecasting Models Using Evolutionary Optimization Algorithms
Amir Banerjee (Penn State University Harrisburg, USA); Jianyan Tian | Shengqiang Wang | Wei Gao (Taiyuan University of Technology, P.R. China)

65 - A Comparative Analysis of the Performance of Scalable Parallel Patterns Applied to Genetic Algorithms and Configured for NVIDIA GPUs
David Radford | David Calvert (University of Guelph, Canada)
A Tail of Three Bio-inspired Computing Paradigms

Abstract: I will provide a high level walk-through for three computational approaches derived from Nature. First, evolutionary computation implements what we may call the “mother of all adaptive processes.” Some variants on the basic algorithms will be sketched and some lessons we have gleaned from three decades of working with EC will be covered. Then neural networks, computational approaches that have long been studied as possible ways to make “thinking machines”, an old dream of man’s, and based upon the only known existing example of intelligence. Then a little overview of attempts to combine these two approaches that some hope will allow us to evolve machines we could never hand-craft. Finally, I will touch on artificial immune systems, Nature’s highly sophisticated defense mechanism, that has emerged in two major stages, the innate and the adaptive immune systems. This technology is finding applications in the cyber security world.

Biography:

J. David Schaffer, Ph.D., recently retired as a Research Fellow after 25 years with Philips Research. He now advises graduate students and initiates research projects at Binghamton University in the domains of bioinformatics, evolving intelligent machines, and Alzheimer’s disease. He believes that evolutionary computation is one of the most valuable technologies for mastering complexity. Dr Schaffer holds a B.S. in Aerospace Engineering from Notre Dame, M.S. in Systems Engineering from Widener University, and Ph.D. in Electrical Engineering from Vanderbilt. He has published about 100 peer-reviewed papers, serves on the editorial board for the Evolutionary Computation Journal, and the steering committee for the Evolutionary Multi-objective Optimization conference series. He holds forty-three issued US patents. In 2012, he was named a Pioneer in Evolutionary Computation by the IEEE Computational Intelligence Society.
Conference Schedule
Tuesday Morning, October 31, 2017

Presentations are noted by corresponding page number in proceedings. Presenters' names are underlined.

Registration Desk Open
7:30 a.m. – 5:00 p.m.
(Chicago Boardroom)

Continental Breakfast
7:30 a.m. – 8:30 a.m.
(Ontario A)

Morning Plenary Session
8:00 a.m. – 9:00 a.m.
(Ontario B)

Announcements
A Tail of Three Bio-inspired Computing Paradigms
Speaker: J. David Schaffer

J. David Schaffer, Ph.D.
Institute for Justice and Well-Being
Binghamton University

(SPEAKER PROFILE ON PAGE 10)

Technical Session V (General)
9:00 a.m. – 10:30 a.m.

Biologically Inspired Neural Network Architectures
Ontario B

Session Chair: Walker Land
Binghamton University, USA

184 - Initial Experiments Evolving Spiking Neural Networks with Supervised Learning Capability
J. David Schaffer (Binghamton University, USA)

192 - The Uncertainty Area Metric: A Method for Comparing Learning Machines on What They Don’t Know
Walker H. Land, Jr. | J. David Schaffer (Binghamton University, USA)

200 - Predicting with Confidence: Classifiers That Know What They Don’t Know
J. David Schaffer | Walker H. Land, Jr. (Binghamton University, USA)

208 - Investigating Artificial Cells’ Spatial Proliferation with a Gene Regulatory Network
Jean Marie Dembele (Université Gaston Berger de Saint-Louis, Sénégal & Sorbonne Universités, France);
Sylvain Cussat-Blanc | Jean Disset | Yves Duthen (University of Toulouse, France)

Technical Sessions V
(General)
9:00 a.m. – 10:30 a.m.
(See schedule at right)

Biologically Inspired Neural Network Architectures
Session Chair: Walker Land
Ontario B

Morning Break
10:30 a.m. – 11:00 a.m.
(Ontario A)
Conference Schedule
Tuesday Morning/Afternoon, October 31, 2017

Presentations are noted by corresponding page number in proceedings. Presenters names are underlined.

Registration Desk Open
7:30 a.m. – 5:00 p.m.
(Chicago Boardroom)

Technical Sessions VI (Concurrent)
11:00 a.m. – 12:30 p.m.
(See schedule at right)

Risk in Complex Systems
Session Chair: Davinia Rizzo
(Ontario B)

Business and Financial Analytics
Session Chair: David Enke
(Ontario C)

Luncheon
12:30 p.m. – 1:30 p.m.
(Ontario A)

Technical Sessions VI
(Concurrent)
11:00 a.m. – 12:30 p.m.

Risk in Complex Systems
Ontario B
Session Chair: Davinia Rizzo
Sandia National Laboratories, USA

28 - Minimizing Safety Risks in Complex Systems
Chandru Mirchandani (George Washington University, USA)

37 - Architecting Very Large, Complex Bayesian Network Simulations for Practical Airworthiness Risk Assessment Applications
John G. Lindley | Mark R. Blackburn (Stevens Institute of Technology, USA)

106 - A Statistical and Cluster Analysis Exploratory Study of Snort Rules
Claude Turner (Norfolk State University, USA); Anthony Joseph (Pace University, USA)

47 - Is Digital Thread/Digital Twin Affordable? A Systemic Assessment of the Cost of DoD’s Latest Manhattan Project
Timothy D. West (US Air Force, USA); Mark R. Blackburn (Stevens Institute of Technology, USA)

Business and Financial Analytics
Ontario C
Session Chair: David Enke
Missouri University of Science and Technology, USA

465 - Instance Selection Using Genetic Algorithms for an Intelligent Ensemble Trading System
Youngmin Kim | David Enke (Missouri University of Science and Technology, USA)

473 - A Deep Neural-Network Based Stock Trading System Based on Evolutionary Optimized Technical Analysis Parameters
Omer Berat Sezer | Murat Ozbayoglu (TOBB University of Economics and Technology, Turkey); Erdogan Dogdu (Cankaya University, Turkey)

481 - Daily Stock Returns Characteristics and Forecastability
Anthony Joseph | Maurice Larrain (Pace University, USA); Claude Turner (Norfolk State University, USA)

(SPEAKER PROFILE ON PAGE 13)
Quality-driven Reference Architecture Incremental Design: 
An Industrial Experience

Abstract: The objective is to describe a methodology to define a Reference Architecture that will ease the further development of complex systems in a given domain. The Reference Architecture contains variations points, first step to the design of a Software Product Line. Early product quality considerations are taken into account, based on the ISO/IEC 26550 reference model guidelines for Software Product Line engineering, introducing required qualities as variation criteria. A bottom-up strategy will be followed starting from an existing product. The logic view of the Reference Architecture is incrementally developed in a four step process. The first step shows the architecture with main functional components. The second step establishes the traceability among functional components and the quality requirements needed by the functionalities to perform conveniently their tasks, expressed also as non-functional components or implicit functionalities. This link is maintained in the third step when components are agglomerated or separated to populate the components of the style. The Reference Architecture configuration is presented in the fourth step with the variability model, which is defined considering similarities among the different tasks performed by the functional and non-functional components. An industrial experience in the Human Resources domain is presented: a Vacation Request System that takes into account different regulations.

Biography:

Nicole Levy, Ph.D., is full professor of software engineering at the French National Conservatory of Arts and Crafts (Cnam), Paris and member of its Study and Research Centre for Informatics and Communications (Cédric) since September 2010. Prior to this assignment, she was member of the Computer Science Laboratory (PRiSM ) at University of Versailles Saint-Quentin en Yvelines where she led a research group. She directed the University of Versailles engineering school, called ISTY. She started her academic career as assistant professor at University of Nancy 1 and was a member of the Lorraine research laboratory in computer science and its applications (LORIA). Her research interests include using formal methods to specify complex systems and software architectures. She is mostly interested in the development and reconfiguration processes for software architectures based on both functional and non-functional properties.
Conference Schedule
Tuesday Afternoon, October 31, 2017

Presentations are noted by corresponding page number in proceedings. Presenters names are underlined.

Registration Desk Open
7:30 a.m. – 5:00 p.m.
(Chicago Boardroom)

Technical Sessions VII (Concurrent)
1:30 p.m. – 3:00 p.m.
(See schedule at right)

Complex System Architecting
Ontario B
Session Chair: Chandru Mirchandani
Leidos/George Washington University, USA

175 - The Impact of Funding Profiles on Budget Success
Alan K. Gideon (The MITRE Corporation, USA)

83 - Three-Step Approach to QoS Maintenance in Cloud Computing Using a Third Party Auditor
Hannah Roddy | Joseph Pfeffer | Syed Rizvi | Joseph Gualdoni | Ilva Myzyri (Pennsylvania State University, USA)

116 - A Framework to Study the Emergence of Non-Communicable Diseases
Orlando Simpson | Sergio Camorlinga (University of Winnipeg, Canada)

Computational Intelligence Models for Intelligent Transportation Systems
Ontario C
Session Chair: Omer Berat Sezer
TOBB University of Economics and Technology, Turkey

515 - Automated Vehicle Classification with Image Processing and Computational Intelligence
Selim S. Sarikan | Oguzhan Zilci (Aselsan Inc, Turkey) A. Murat Ozbayoglu (TOBB University of Economics and Technology, Turkey)

523 - An Empirical Study to Investigate the Effect of Air Density Changes on the DSRC Performance
Mostafa El-Said | Vijay Bhuse (Grand Valley State University, USA); Alexander Arendsen (University of Central Florida, USA)

507 - A Novel Feature Extraction Algorithm for IED Detection from 2-D Images Using Minimum Connected Components
Viayalakshmi Ramasamy (Miami University, USA); D. Nandagopal | M. Tran (University of South Australia, Australia); C. Abeynayake (Defence Science and Technology Group, Australia)

499 - Scheduling the Real-Time Transmission of Periodic Measurements in 802.15.4 Wireless Sensor Network
Sixto Campaña (Universidad Nacional Abierta y a Distancia - UNAD, Colombia); Jorge Londoño (Universidad Pontificia Bolivariana, Colombia)
Conference Schedule
Tuesday Afternoon, October 31, 2017

Presentations are noted by corresponding page number in proceedings. Presenters names are underlined.

Registration Desk Open
7:30 a.m. – 5:00 p.m.
(Chicago Boardroom)

Technical Sessions VIII (Concurrent)
3:30 p.m. – 5:00 p.m.
(See schedule at right)

Machine Learning and Optimization Applications
Ontario B
Session Chair: Dincer Konur
Missouri University of Science and Technology, USA

314 - Reducing Tropical Cyclone Prediction Errors Using Machine Learning Approaches
Michael B. Richman | Lance M. Leslie (University of Oklahoma, USA); Hamish A. Ramsay (Monash University, Australia); Philip J. Klotzbach (Colorado State University, USA)

333 - Atlantic Tropical Cyclone Rapid Intensification Probabilistic Forecasts from an Ensemble of Machine Learning Methods
Andrew Mercer | Alexandria Grimes (Mississippi State University, USA)

491 - Loading Time Flexibility in Cross-docking Systems
Dincer Konur (Missouri University of Science and Technology, USA); Mihalis M. Golias (University of Memphis, USA)

441 - A Fuzzy-Preconditioned GRBFN Model for Electricity Price Forecasting
Satoshi Itaba | Hiroyuki Mori (Meiji University, Japan)

449 - Fault Diagnosis Based Approach to Protecting DC Microgrid Using Machine Learning Technique
Ibrahim Almutairy | Marwan Alluhaidan (Western Michigan University, USA)

457 - Modeling and Protection for Low-Voltage DC Microgrids Riding Through Short Circuiting
Marwan Alluhaidan | Ibrahim Almutairy (Western Michigan University, USA)

Awards Banquet & Banquet Speaker
6:30 p.m. – 9:00 p.m.
(Ontario A)

Complexity in Engineering
Large Scale Censuses and Surveys
Speaker: Fred Highland
Fred Highland
Graduate Faculty, Systems Engineering
University of Maryland, Baltimore County

(SPEAKER PROFILE ON PAGE 16)
Complexity in Engineering Large Scale Censuses and Surveys

Abstract: A population census is one of the largest and most complex operations a government performs. It requires years of planning, development of hundreds of systems and the coordination of thousands of workers to produce results that are critical to running the government and the nation for many years into the future. While seemingly a simple data collection and analysis task, a census or survey must address a number of statistical, social, political and economic issues taking it beyond complicated into the realm of complex systems. In addition, economic and social pressures are forcing statistical organizations to conduct less intrusive and more cost-effective surveys by employing generalized survey systems, adaptive survey design and administrative records that further increase potential complexity issues. The talk will discuss the census and survey process, the complexity issues that arise in creating and operating large scale national survey systems, the trend toward administrative record usage and adaptive survey design, and the complex system engineering challenges that all of these bring.

Biography:
Fred Highland is an adjunct instructor in the Systems Engineering program at University of Maryland, Baltimore County. He has over 38 years of experience in software and systems technology with Lockheed Martin where he was a Senior Fellow and Master Systems Architect responsible for architecture and development of complex systems including the NASA Space Shuttle, Census data collection systems, artificial intelligence applications and big data analytics. His research interests include application of complex systems to systems engineering and architecture as well as neurocomputing using polychronous wavefront computing. Mr. Highland received his M.S. in Computer Science from the University of Houston and a B.S. in Computer Science from the University of Rhode Island.
Conference Schedule
Wednesday, November 1, 2017
Presentations are noted by corresponding page number in proceedings. Presenters names are underlined.

Registration Desk Open
7:30 a.m. – 12:00 p.m.
(Chicago Boardroom)

Continental Breakfast
7:30 a.m. – 8:30 a.m.
(Ontario A)

Morning Plenary Session
8:00 a.m. – 9:00 a.m.
(Ontario B)

Unreliable Media Research at MIT Lincoln Laboratory
Speaker: Charlie K. Dagli
Charlie K. Dagli, Ph.D.
MIT Lincoln Laboratory
(SPEAKER PROFILE ON PAGE 18)

Technical Sessions IX (General)
9:00 a.m. – 10:30 a.m.
(See schedule at right)

Cyber Manufacturing Systems
Session Chair: Young Moon
Ontario B
Syracuse University, USA

375 - Coordination of Constituent Systems for Functionalizing Systems of Systems: An Explorations
Walter L. Barnes, II | Madison Calvin | Katherine Linville | Ruwen Qin (Missouri University of Science and Technology, USA); Ya-nan Song | Rong-hua Xu (Guangdong University of Technology, PR. China), Bo Zhao (State Grid Zhejiang Electric Power Company)

Md. Monirul Islam | Zeyi Sun | Cihan H. Dagli (Missouri University of Science and Technology, USA)

367 - Taxonomy of Cross-Domain Attacks on Cyber Manufacturing System
Mingtao Wu | Young B. Moon (Syracuse University, USA)

425 - Reward/Penalty Design in Demand Response for Mitigating Overgeneration Considering the Benefits from Both Manufacturers and Utility Company
Md. Monirul Islam | Zeyi Sun | Cihan H Dagli (Missouri University of Science and Technology, USA)

Technical Sessions X (General)
11:00 a.m. – 12:30 p.m.

Smart Grid and Manufacturing
Session Chair: Zeyi Sun
Ontario B
Missouri University of Science and Technology, USA

392 - Modeling and Simulation of Microgrid
Ahmad Alzahrani | Mehdi Ferdowsi | Pourya Shamsi | Cihan H Dagli (Missouri University of Science and Technology, USA)

433 - Design the Capacity of Onsite Generation System with Renewable Sources for Manufacturing Plant
Xiao Zhong | Md Monirul Islam | Haoyi Xiong | Zeyi Sun (Missouri University of Science and Technology, USA)

408 - Chaotic Behavior in High-Gain Interleaved Dc-Dc Converters
Ahmad Alzahrani | Pourya Shamsi | Mehdi Ferdowsi | Cihan H Dagli (Missouri University of Science and Technology, USA)

401 - Fuzzy Inference System-based Recognition of Slow, Medium and Fast Running Conditions Using a Triaxial Accelerometer
Nizam Uddin Abahmed | Lauren Benson | Christian Clermont | Sean T. Osis | Reed Ferber (University of Calgary, Canada)

Conference Adjourns
12:30 p.m.
Conference Plenary Speaker
Wednesday, November 1, 2017 | 8:00 a.m. – 9:00 a.m. | Ontario B

Unreliable Media Research at MIT Lincoln Laboratory

Abstract: TBA

Biography:

Charlie K. Dagli, Ph.D., has been a member of the research staff in the Human Language Technology Group at MIT Lincoln Laboratory since January 2010. His primary research interests are in the areas of multimedia understanding, machine learning, and network analysis. Prior to joining Lincoln Laboratory, he held positions at Hewlett-Packard Laboratories, Ricoh Innovations, and State Farm Corporate Research. He was the recipient of the Best Student Paper award at the 2006 ACM International Conference on Image and Video Retrieval and holds three patents for technologies in computer vision and multimedia analysis.

Dr. Dagli received his B.S. degree from Boston University in 2001, and the M.S. and Ph.D. degrees from the University of Illinois, Urbana-Champaign, in 2003 and 2009, all in electrical and computer engineering.
Thank you

On behalf of the Complex Adaptive Systems Conference Organizing Committee, we would like to express our appreciation to this year’s esteemed sponsors.

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Proceedings

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