

2017 ACM/IEEE 8th International Conference on Cyber-Physical Systems (ICCPS 2017)

**Pittsburgh, Pennsylvania, USA
18 – 21 April 2017**



**IEEE Catalog Number: CFP17CYP-POD
ISBN: 978-1-4673-9145-0**

**Copyright © 2017, Association for Computing Machinery (ACM)
All Rights Reserved**

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17CYP-POD
ISBN (Print-On-Demand):	978-1-4673-9145-0
ISBN (Online):	978-1-4503-4965-9
ISSN:	2375-8317

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2017 ACM/IEEE 8th International Conference on Cyber-Physical Systems

ICCPS 2017

Table of Contents

Message from the General and Program Co-Chairs	ix
Conference Organizers.....	x
Technical Program Committee.....	xi
Additional Reviewers.....	xii

Control Synthesis

Sampling-Based Control Synthesis for Multi-robot Systems under Global Temporal Specifications.....	3
<i>Yiannis Kantaros and Michael M. Zavlanos</i>	
Formal Synthesis of Distributed Optimal Traffic Control Policies	15
<i>Sadra Sadraddini, Janos Rudan, and Calin Belta</i>	
Multi-objective Optimal Control with Safety as a Priority.....	25
<i>Kendra Lesser and Alessandro Abate</i>	
Enhancing Tolerance to Unexpected Jumps in GR(1) Games.....	37
<i>Sumanth Dathathri, Scott C. Livingston, and Richard M. Murray</i>	

Energy and Power

Battery State-of-Health Estimation for Mobile Devices.....	51
<i>Liang He, Eugene Kim, Kang G. Shin, Guozhu Meng, and Tian He</i>	
SunShade: Enabling Software-Defined Solar-Powered Systems.....	61
<i>Akansha Singh, Stephen Lee, David Irwin, and Prashant Shenoy</i>	
Distributed Placement of Power Generation Resources in Uncertain Environments	71
<i>Gaurav Gupta and Paul Bogdan</i>	

Work-in-Progress

WiP Abstract: A Physiology-Aware Communication Architecture for Distributed Emergency Medical CPS.....	83
<i>Mohammad Hosseini, Richard R. Berlin, and Lui Sha</i>	
WiP Abstract: Cybermanufacturing in the Shared Economy.....	85
<i>Shivakumar Sastry and Aniruddha Gokhale</i>	
WiP Abstract: Diagnostics and Prognostics Using Temporal Causal Models for Cyber Physical Energy Systems.....	87
<i>Ajay Chhokra, Saqib Hasan, Abhishek Dubey, Nagabhushan Mahadevan, and Gabor Karsai</i>	
WiP Abstract: Towards a Framework for Comprehensive and Systematic Reliability Evaluation of Building Management Systems	89
<i>Sanja Lazarova-Molnar</i>	
WiP Abstract: Transactive Energy Demo with RIAPS Platform	91
<i>Scott Eisele, Abhishek Dubey, Gabor Karsai, and Srdjan Lukic</i>	
WiP Abstract: Platform for Security-Aware Design of Human-on-the-Loop Cyber-Physical Systems	93
<i>Mahmoud Elfar, Haibei Zhu, Adithya Raghunathan, Yi Y. Tay, Jeffrey Wubbenhorst, M. L. Cummings, and Miroslav Pajic</i>	

Modeling and Analysis

Constructing Compact Causal Mathematical Models for Complex Dynamics	97
<i>Yuankun Xue and Paul Bogdan</i>	
Analyzing Neighborhoods of Falsifying Traces in Cyber-Physical Systems.....	109
<i>Ram Das Diwakaran, Sriram Sankaranarayanan, and Ashutosh Trivedi</i>	
Abstraction Based Reachability Analysis for Finite Branching Stochastic Hybrid Systems	121
<i>Wenji Zhang, Pavithra Prabhakar, and Balasubramaniam Natarajan</i>	
A Gaussian Process Regression Approach to Model Aircraft Engine Fuel Flow Rate.....	131
<i>Yashovardhan Sushil Chati, and Hamsa Balakrishnan</i>	

Resilience

VirtualDrone: Virtual Sensing, Actuation, and Communication for Attack-Resilient Unmanned Aerial Systems	143
<i>Man-Ki Yoon, Bo Liu, Naira Hovakimyan, and Lui Sha</i>	

Resilient Linear Classification: An Approach to Deal with Attacks on Training Data	155
<i>Sangdon Park, James Weimer, and Insup Lee</i>	

Resilient Sensor Placement for Fault Localization in Water Distribution Networks	165
<i>Waseem Abbas, Lina Sela Perelman, Saurabh Amin, and Xenofon Koutsoukos</i>	

Privacy, Fault Tolerance, and Security

Privacy-Enhanced Architecture for Occupancy-Based HVAC Control	177
<i>Ruoxi Jia, Roy Dong, S. Shankar Sastry, and Costas J. Sappas</i>	

A Submodular Optimization Approach to Controlled Islanding under Cascading Failure.....	187
<i>Zhipeng Liu, Andrew Clark, Phillip Lee, Linda Bushnell, Daniel Kirschen, and Radha Poovendran</i>	

Application and System-Level Software Fault Tolerance through Full System Restarts.....	197
<i>Fardin Abdi, Rohan Tabish, Matthias Rungger, Majid Zamani, and Marco Caccamo</i>	

Hardware Module-Based Message Authentication in Intra-vehicle Networks	207
<i>Eric Wang, William Xu, Suhass Sastry, Songsong Liu, and Kai Zeng</i>	

Coordination

A Merging Protocol for Self-Driving Vehicles.....	219
<i>Shunsuke Aoki and Ragnathan (Raj) Rajkumar</i>	

GreenDrive: A Smartphone-Based Intelligent Speed Adaptation System with Real-Time Traffic Signal Prediction	229
<i>Yiran Zhao, Shen Li, Shaohan Hu, Lu Su, Shuochao Yao, Huajie Shao, Hongwei Wang, and Tarek Abdelzaher</i>	

DRONA: A Framework for Safe Distributed Mobile Robotics.....	239
<i>Ankush Desai, Indranil Saha, Jianqiao Yang, Shaz Qadeer, and Sanjit A. Seshia</i>	

Provably-Correct Coordination of Large Collections of Agents with Counting Temporal Logic Constraints	249
<i>Yunus Emre Sahin, Petter Nilsson, and Necmiye Ozay</i>	

Vehicle Routing and Activity Monitoring

Data-Driven Distributionally Robust Vehicle Balancing Using Dynamic Region Partitions.....	261
<i>Fei Miao, Shuo Han, Abdeltawab M. Hendawi, Mohamed E Khalefa, John A. Stankovic, and George J. Pappas</i>	

Markov Decision Process Routing Games	273
<i>Dan Calderone and S. Shankar Sastry</i>	
QuActive: A Quality of Activities Monitoring and Notification System	281
<i>Ifat Afrin Emi, Md. Abu Sayeed Mondol, and John A. Stankovic</i>	
Personalization without User Interruption: Boosting Activity Recognition in New Subjects Using Unlabeled Data	293
<i>Ramin Fallahzadeh and Hassan Ghasemzadeh</i>	
Author Index	303