CPS Week 2015 Program

Seattle, WA, April 13 – 16

Room Assignments

Function	Location			
Plenary Keynotes (Tue, Wed, Thu, 8:30AM-10AM)	TCC/LL4&LL5			
HSCC	TCC/LL2			
ICCPS	TCC/LL4			
IPSN	TCC/101			
RTAS	TCC/LL5			
Posters and Demos (Tue 5PM—8PM)	TCC/3rd floor			
Location Competition (Mon & Tue)	TCC/3rd floor			
CPS Community Forum (Tue 8PM — 9:30PM)	TCC/LL2			
N2Women Meeting (Wed 12PM—1:30PM)	TCC/101			
Monday Events				
Big Data Analytics in CPS	TCC/101			
Swarm at the Edge of the Cloud	TCC/LL4			
Robotic Sensor Networks	TCC/LL2			
Medical Cyber-Physical Systems (MedicalCPS)	TCC/204			
Feedback Computing	Hyatt/Discovery A			
Modeling and Simulation of Cyber-Physical Energy Systems	TCC/LL3			
AdaPtive and Reconfigurable Embedded Systems	Hyatt/Discovery B			
CPS for Smart Water Networks (CySWater)	Hyatt/Portland B			
Numerical Software Verification (NSV-VIII)	TCC/LL1			
Applied veRification for Continuous and Hybrid Systems (ARCH)	TCC/205			
Emerging Ideas and Trends in Engineering of CPS (EITEC)	TCC/102			
Certifiable Multicore Avionics Systems (CMAS)	TCC/LL5			
NSF ECI Workshop on Smart City and CPS	TCC/202			
Transatlantic Cyber-Physical Systems Summit	Hyatt/Portland A			
Forum on Artifact Evaluation (5PM—6:30PM)	TCC/LL5			
IPSN PhD Forum (1PM—5PM)	TCC/203			
Services				
Registration	TCC/1 st floor			
Breakfast (7AM) and Lunch (12PM)	TCC/303 & 304			
Conference Banquet	Chihuly			

Master Schedule

Time	Monday	Tuesday	Wednesday	Thursday	
7:30		nd registration			
8:15					
8:30		Opening & Keynote	Awards &	Awards &	
9:00	Session 1		Keynote	Keynote	
9:30	26331011 1				
10:00	Break	Break	Break	Break	
10:30	Workshop			Session 7	
11:00	Session 2	Session 1	Session 4		
11:30	30331011 2				
12:00	Lunch	Lunch	N2Womon Danol		
12:30	Editeri	Lunch		Lunch on self	
13:00	Workshop	p Session 2	Lunch		
13:30	Session 3		Session 5	Session 8	
14:00	30330113				
14:30	Break	Break			
15:00			Break Session 6	Break	
15:30	Workshop	Session 3		Session 9	
16:00	Session 4	56351011 5			
16:30					
17:00	Forum on				
17:30	Artifact		Brook/Trovol	Close	
18:00	Evaluation	Posters & Demos	breaky traver		
18:30		Reception			
19:00					
19:30			Danguat		
20:00			Banquet		
20:30		CPS Forum			
21:00					

Main Program

4/14 (Tuesday)

	HSCC	ICCPS	IPSN	RTAS
8:15		Оре	ning Remark	·
8:45 _ 10:00	Plenary Keynote:	Sensors, P Eric Horvit	redictions, and Decisions z (Microsoft Research)	
10:30 12:00	A Viability Approach for Fast Recursive Feasible Finite Horizon Path Planning of Autonomous RC Cars Alexander Liniger and John Lygeros Reach-Avoid Problems with Time-Varying Dynamics, Targets and Constraints Jaime Fisac, Mo Chen, Claire Tomlin and Shankar Sastry An Improved Algorithm for Robust Safety Analysis of Sampled Data Systems Ian M. Mitchell and Shahab Kaynama	Sensor Attack Detection in the Presence of Transient Faults Junkil Park, Radoslav Ivanov, James Weimer, Miroslav Pajic and Insup Lee Experimental Analysis of Denial-of-Service Attacks on Teleoperated Robotic Systems Tamara Bonaci, Junjie Yan, Jeffrey Herron, Tadayoshi Kohno and Howard Chizeck Local Open- and Closed- Loop Manipulation of Multi-Agent Networks Jackeline Abad Torres, Dinuka Sahabandu, Rahul Dhal and Sandip Roy	TIIM: Technology-IndependentInterference Mitigation forLow-power Wireless NetworksAnwar Hithnawi, HosseinShafagh, and Simon DuquennoyDecentralized MultichannelMedium Access Control:Viewing Desynchronization as aConvex Optimization MethodNikos Deligiannis, João F. C.Mota, George Smart, andYiannis AndreopoulosBringing Multi-Antenna Gain toEnergy-Constrained WirelessDevicesSanjib Sur, Teng Wei, and XinyuZhangOptimal Placement ofProtective Jammers forSecuring WirelessTransmissions in a GeographicDomainGuy Grebla, Estie Arkin, JosephS. B. Mitchell, Michael Segal,Alon Efrat, Yuval Cassuto, andSwaminathan Sankaraaraman	 Providing Task Isolation via TLB Coloring Frank Mueller and Shrinivas Panchamukhi Optimizing Deterministic Garbage Collection in NAND Flash Storage Systems Qi Zhang, Xuandong Li, Linzhang Wang, Tian Zhang, Yi Wang and Zili Shao Top-Down and Bottom-Up Multi-Level Cache Analysis for WCET Estimation Zhenkai Zhang and Xenofon Koutsoukos
13:00 - 14:30	What's Decidable About Recursive Hybrid Automata? Krishna S., Lakshmi Manasa and Ashutosh Trivedi Bounded-Rate Multi- Mode Systems Based Motion Planning Devendra Bhave, Sagar Jha, Krishna S., Sven Schewe and Ashutosh Trivedi	Fault Detection in Adaptive Learning Based Control Systems Towards Trusted Autonomy Xiaodong Zhang, Matthew Clark, Kuldip Rattan and Jonathan Muse CPS Approach to Checking Norm Operation of a Brake-by-Wire System Kyong Tak Cho, Kang Geun Shin and Taejoon Park	RAMP: Accelerating Wireless Sensor Hardware Design with a Reconfigurable Analog/Mixed- Signal Platform Brandon Rumberg, David W. Graham, Spencer Clites, Brandon Kelly, Mir Mohammad Navidi, Alex Dilello, and Vinod Kulathumani SunaPlayer: High-Accuracy Emulation of Solar cells Stanislav Bobovych, Nilanjan Banerjee, Ryan Robucci, James Parkerson, Jackson Schmandt and Chintan Patel	Analysis of Real-Time Multi-Modal FP-Scheduled Systems with Non- Preemptible Regions Masud Ahmed, Pradeep Hettiarachchi and Nathan Fisher The Packing Server for Real-Time Scheduling of MapReduce Workflows Shen Li, Shaohan Hu and Tarek Abdelzaher

	A sufficient condition for the boundedness of matrix products accepted by an automaton Matthew Philippe and Raphaël Jungers	Distributed Fault Detection of Nonlinear Large-Scale Dynamic Systems Elaheh Noursadeghi and Ioannis Raptis	A Software-defined Sensor Architecture for Large-scale Wideband Spectrum Monitoring Damian Pfammatter, Domenico Giustiniano, and Vincent Lenders ORBIT: A Smartphone-Based Platform for Data-Intensive Embedded Sensing Applications Mohammad-Mahdi Moazzami, Dennis E. Phillips, Rui Tan, and Guoliang Xing	Jfair: A Scheduling Algorithm to Stabilize Control Applications Amir Aminifar, Petru Eles and Zebo Peng
15:00 17:00	Efficient Finite Abstraction of Mixed Monotone Systems Samuel Coogan and Murat Arcak Compositional Construction of Approximate Abstractions Matthias Rungger and Majid Zamani Computing Bisimulation Functions using SOS Optimization and delta- decidability over the Reals Abhishek Murthy, Md. Ariful Islam, Radu Grosu and Scott Smolka Probabilistic Diagnosability of Hybrid Systems Yi Deng, Agung Julius and Alessandro D'innocenzo	Exploiting Structured Human Interactions to Enhance Estimation Accuracy in Cyber-physical Systems Yunlong Gao, Shaohan Hu, Renato Mancuso, Hongwei Wang, Minje Kim, Poliang Wu, Lu Su, Lui Sha and Tarek Abdelzaher Controller Synthesis for Autonomous Systems Interacting with Human Operators Lu Feng, Clemens Wiltsche, Laura Humphrey and Ufuk Topcu Fully Bayesian Learning and Spatial Reasoning with Flexible Human Sensor Networks Nisar Ahmed, Mark Campbell, David Casbeer, Yongcan Cao and Derek Kingston REST: A Reliable Estimation of Stopping Time Algorithm for Social Game Experiments Ming Jin, Lillian Ratliff, Ioannis Konstantakopoulos, Costas Spanos and Shankar Sastry	Tongue-n-Cheek: Non-contact Tongue Gesture Recognition Zheng Li, Ryan Robucci, Nilanjan Banerjee, and Chintan Patel Hand Hygiene Duration and Technique Recognition Using Wrist-worn Sensors Valerie Galluzzi, Ted Herman, and Philip Polgreen Graph Scale-Space Theory for Distributed Peak and Pit Identification Andreas Loukas, Marco Cattani, Marco Zuniga, and Jie Gao Cost-Aware Compressive Sensing for Networked Sensing Systems Liwen Xu, Xiaohong Hao, Nicolas D. Lane, Xin Liu, and Thomas Moscibroda	 POET: A Portable Approach to Minimizing Energy Under Soft Real- time Constraints Connor Imes, David H. K. Kim, Martina Maggio and Henry Hoffmann GPES: A Preemptive Execution System for GPGPU Computing Husheng Zhou, Guangmo Tong and Cong Liu When Thermal Control Meets Sensor Noise: Analysis of Noise-induced Temperature Error Dohwan Kim, Kyung-Joon Park, Yongsoon Eun, Sang H. Son and Chenyang Lu Ultrasonic Time Synchronization and Ranging on Smartphones Patrick Lazik, Niranjini Rajagopal, Bruno Sinopoli and Anthony Rowe
17:00 -		Posters and Demos Reception		RTAS WiP Session
20:00 20:00 - 21:30		CPS Community Forum		IEEE TCRTS Open Meeting

4/15 (Wednesday)

	HSCC	ICCPS	IPSN	RTAS
8:15	Best Paper Award Announcements			
8:30 - 10:00	Plenary Keynote	Population John Lygero	Control s (ETH Zurich)	
10:30 _ 12:00	Dynamic Scheduling for Networked Control Systems Indranil Saha, Sanjoy Baruah and Rupak Majumdar Closed Loop Analysis of Control Command Software Pierre Roux, Romain Jobredeaux and Pierre- Loic Garoche Real-time Control under Clock Offsets between Sensors and Controllers Kunihisa Okano, Masashi Wakaiki and Joao Hespanha	BEST PAPERS OF ICCPS Taxi Dispatch with Real-Time Sensing Data in Metropolitan Areas - a Receding Horizon Control Approach Fei Miao, Shan Lin, Sirajum Munir, John A. Stankovic, Hua Huang, Desheng Zhang, Tian He and George J. Pappas Early Detection of Critical Pulmonary Shunts in Infants Radoslav Ivanov, James Weimer, Allan Simpao, Mohamed Rehman and Insup Lee Response-Time Analysis for Real-Time Tasks in Engine Control Applications Alessandro Biondi, Marco Di Natale and Giorgio Buttazzo	PIR Sensors: Characterization and Novel Localization Technique Sujay Narayana, Sripad Kowshik, Madhuri Iyer, R R Venkatesha Prasad, Prabhakar T V and Vijay Rao Radio-based Device-free Activity Recognition with Radio Frequency Interference Bo Wei, Wen Hu, Mingrui Yang, and Chun Tung Chou dRTI: Directional Radio Tomographic Imaging Bo Wei, Ambuj Varshney, Neal Patwari, Wen Hu, Thiemo Voigt, and Chun Tung Chou A Realistic Evaluation and Comparison of Indoor Location Technologies: Experiences and Lessons Learned	SPeCK: A Kernel for Scalable Predictability Qi Wang, Yuxin Ren, Matt Scaperoth and Gabriel Parmer AUTOBEST: A United AUTOSAR-OS and ARINC 653 Kernel Alexander Zupke, Marc Bommert and Daniel Lohmann Prioritizing Soft Real-Time Network Traffic in Virtualized Hosts Based on Xen Chong Li, Sisu Xi, Chenyang Lu, Chris Gill and Roch Guerin
13:30 _ 15:00	Keynote – Will future cars have formally verified powertrain control software? Jyotirmoy V. Deshmukh Tool Paper - HYST: A Source Transformation and Translation Tool for Hybrid Automaton Models Stanley Bak, Sergiy Bogomolov and Taylor T Johnson Tool Paper - ProbReach: Verified Probabilistic Delta-Reachability for Stochastic Hybrid Systems Fedor Shmarov and Paolo Zuliani	KEYNOTE: Smart Cities as Cyber- Physical Systems Christos G. Cassandras Work In Progress Short Talks	Debiasing Crowdsourced Quantitative Characteristics in Local Businesses and Services Robin Wentao Ouyang, Lance Kaplan, Paul Martin, Alice Toniolo, Mani Srivastava, and Timothy J. Norman Scalable Social Sensing of Interdependent Phenomena Shiguang Wang, Lu Su, Shen Li, Shaohan Hu, Tanvir Amin, Hongwei Wang, Shuochao Yao, Lance Kaplan, and Tarek Abdelzaher QueueVadis: Queuing Analytics using Smartphones Tadashi Okoshi, Vu Lu, Chetna Vig, Youngki Lee, Rajesh Krishna Balan, and Archan Misra	13:00 – 15:00 Industrial Session: The industry panel is convened to discuss current and future needs for advances in the state of the art in real-time systems, especially in the context of new challenges and recent research progress in mixed- criticality systems and multi- core real-time platforms. Each panelist will give a brief position statement and an explanation of why those needs are as yet unmet, and then will engage in discussion following the presentations based on questions and comments from the audience and from other panelists.

			Feeder: Supporting Last-Mile	
			Transit with Extreme-Scale	
			Urban Infrastructure Data	
			Desheng Zhang, Juanjuan Zhao	
			Fan Zhang, Ruobing Jiang, and	
			Tian He	
	On delta-sampling safety	Realization of Nonlinear	15:30 – 16:30	An Efficient Configuration
	verification for discrete-	Real-Time Optimization	Location Competition Panel	Methodology for Time-
	time, possibly	Based Controllers on Self-		Division Multiplexed Single
	discontinuous systems	Contained Trafemoral	16:30 – 17:30	Resources
	Ruxandra Valentina Bobiti	Prosthesis	IPSN Business Meeting	Benny Akesson, Anna
	and Mircea Lazar	Huihua Zhao, Jake Reher,		Minaeva, Premysl Sucha,
		Jonathan Horn, Victor Paredes		Andrew Nelson and Zdenek
	Eliminating Spurious	and Aaron Ames		Hanzalek
	Transitions in			
	Reachability with Support	A Hybrid Model Predictive		Task Placement and
	Functions	Controller for Path Planning		Selection of Data
	Goran Frehse, Sergiy	and Path Following		Consistency Mechanisms
	Bogomolov, Marius	Kun Zhang, Jonathan Sprinkle		for Real-Time Multicore
	Greitschus, Thomas	and Ricardo Sanfelice		Applications
	Strump and Andreas			Zaid Al-bayati, Youcheng
15:30	Podelski	Occupancy Estimation using		Sun, Haibo Zeng, Marco Di
_		Ultrasonic Chirps		Natale, Qi Zhu and Brett
17:30	Finite State	Oliver Shih and Anthony Rowe		Meyer
	Approximation for			
	Verification of Partially	Uniprocessor EDF Scheduling		A Feedback Scheduling
	Observable Stochastic	of AVR Task Systems		Framework for Component-
	Hybrid Systems	Zhishan Guo ana Sanjoy		Based Soft Real-Time
	Cichi	Baruan		Systems
	UISHI			Nima Khanizaa, Fanxin Kony,
	Statistical Varification of			Thomas Notto
	Nonlinear Systems Using			momus None
	Set Oriented Methods			Mixed Criticality Puntime
	Set Offented Methods			Mochanisms and Evaluation
	Yu Wung, Ninu Koom, Matthew West Mahash			on Multicoros
	Viswanathan and Geir			Lukas Signist Georgia
	Dullerud			Giannonoulou Penachena
	Duileruu			Huana Andres Gomez and
				Lothar Thiele
18:30		Confere	nce Banguet	
-	Chihuly Garden and Class			
21:30	305 Harrison St, Seattle, WA 98109 · (206) 753-4940			

4/16 (Thursday)

	HSCC	ICCPS	IPSN	RTAS
8:15		Best Paper Awa	rd Announcements	
8:30 - 10:00	Plenary Keynote:	Up Close and Po Elizabeth Croft	ersonal with Human-Robot Collab (University of British Columbia)	oration
10:30 - 12:00	Requirements for Hybrid Cosimulation Standards David Broman, Lev Greenberg, Edward Lee, Michael Masin, Stavros Tripakis and Michael Wetter SpaTeL: A Novel Spatial- Temporal Logic and Its Applications to Networked Systems Iman Haghighi, Austin Jones, Zhaodan Kong, Ezio Bartocci, Radu Grosu and Calin Belta Computing the Skorokhod Distance between Polygonal Traces Rupak Majumdar and Vinayak Prabhu	SHARE: SoH-Aware Reconfiguration to Enhance Deliverable Capacity of Large-Scale Battery Packs Liang He, Yu Gu, Cong Liu, Ting Zhu and Kang G. Shin Exploring Power-Voltage Relationship for Distributed Peak Demand Flattening in Microgrids Zhichuan Huang, David Corrigan, Ting Zhu, Hongyao Luo, Xiaoxiong Zhan and Yu Gu The Energy Efficiency Problematics in Sports Facilities: Identifying Savings in Daily Grass Heating Operation Mischa Schmidt, Alberto Venturi, Anett Schulke and	Geo-referenced Proximity Detection of Wildlife with WildScope: Design and Characterization Gian Pietro Picco, Davide Molteni, Amy Lynn Murphy, Federico Ossi, Francesca Cagnacci, Michele Corrà, and Sandro Nicoloso How Hot is Piping Hot? Lower Energy Consumption with Smarter Hot Water Delivery Yong Sun, Anindya Prodhan, Erin Griffiths, and Kamin Whitehouse Samba: A Smartphone-Based Robot System for Energy- Efficient Aquatic Environment Monitoring Yu Wang, Rui Tan, Guoliang Xing, Jianxun Wang, Xiaobo	Unifying Fixed- and Dynamic-Priority Scheduling based on Priority Promotion and an Improved Ready Queue Management Technique <i>Risat Mahmud Pathan</i> Budgeted Generalized Rate Monotonic Analysis for the Partitioned, yet Globally Scheduled Uniprocessor Model Jung-Eun Kim, Tarek Abdelzaher and Lui Sha Multicore Scheduling of Parallel Real-Time Tasks with Multiple Parallelization Options Jihye Kwon, Kang-Wook Kim, Sangyoun Paik, Jihwa Lee and Chang-Gun Lee
13:30 15:00	First Steps toward Formal Controller Synthesis for Bipedal Robots Aaron Ames, Paulo Tabuada, Bastian Schuermann, Wen-Loong Ma, Shishir Kolathaya, Matthias Rungger and Jessy Grizzle Vulnerability analysis of dynamic power networks to stochastic link failure attacks Sai Pushpak, Amit Diwadkar and Umesh Vaidya Case Study - Towards Personalized Cancer Therapy Using Delta- Reachability Analysis Bing Liu, Soonho Kong, Sicun Gao, Paolo Zuliani and Edmund Clarke	A Model-based Synthesis Flow for Automotive CPS Peng Deng, Fabio Cremona, Qi Zhu, Marco Di Natale and Haibo Zeng Cyber-Physical Specification Mismatch Identification with Dynamic Analysis Taylor T Johnson, Stanley Bak and Steven Drager Incorporating Emergency Alarms in Reliable Wireless Process Control Bo Li, Lanshun Nie, Chengjie Wu, Humberto Gonzalez and Chenyang Lu	Reducing Multi-Hop Calibration Errors in Large- Scale Mobile Sensor Networks Olga Saukh, David Hasenfratz, and Lothar Thiele TARDIS: Software-Only System-Level Record and Replay in Wireless Sensor Networks Matthew Tancreti, Vinaitheerthan Sundaram, Saurabh Bagchi, and Patrick Eugster SIFT: Building an Internet of Safe Things Chieh-Jan Mike Liang, Börje Karlsson, Nic Lane, Junbei Zhang, Zheyi Pan, Zhao Li, and Feng Zhao	C'Mon: a Predictable Monitoring Infrastructure for System-Level Latent Fault Detection and Recovery Jiguo Song and Gabriel Parmer dOSEK: The Design and Implementation of a Dependability-Oriented Static Embedded Kernel Martin Hoffmann, Florian Lukas, Christian Dietrich and Daniel Lohmann A Generalized Model for Preventing Information Leakage in Hard Real-Time Systems Rodolfo Pellizzoni, Neda Paryab, Man-Ki Yoon, Stanley Bak, Sibin Mohan and Rakesh Bobba

	Case Study - Temporal Logic Motion Planning using POMDPs with Parity Objectives Mária Svoreňová, Martin Chmelík, Kevin Leahy, Hasan Ferit Eniser, Krishnendu Chatterjee, Ivana Černá and Calin Belta		SloT: Securing the Internet of Things through Distributed System Analysis Fernando Augusto Teixeira, Gustavo Vieira Machado, Pablo Marcondes Fonseca, Fernando Magno Quintão Pereira, Hao Chi Wong, José Marcos Silva Nogueira and Leonardo B. Oliveira	
15:30 17:30	Reactive Synthesis from Signal Temporal Logic Specifications Vasumathi Raman, Alexandre Donzé, Dorsa Sadigh, Richard M. Murray and Sanjit A. Seshia Estimator-Based Reactive Synthesis under Incomplete Information Rüdiger Ehlers and Ufuk Topcu Temporal Logic Control for Stochastic Linear Systems using Abstraction Refinement of Probabilistic Games Mária Svoreňová, Jan Křetínský, Martin Chmelík, Krishnendu Chatterjee, Ivana Cerna and Calin Belta Cross-entropy Temporal Logic Motion Planning Scott Livingston, Eric Wolff and Richard Murray	Analysis of the Coupling of Communication network and Safety Application in Cooperative Collision Warning Systems Yaser Fallah and Masoumeh Khandani UrbanCPS: a Cyber-Physical System based on Multi- source Urban Infrastructure Data for Heterogeneous Model Integration Desheng Zhang, Juanjuan Zhao, Fan Zhang and Tian He		Memory Efficient Global Scheduling of Real-time Tasks Ahmed Alhammad, Saud Wasly and Rodolfo Pellizzoni Reverse-engineering Embedded Memory Controllers through Latency-based Analysis Mohamed Hassan, Anirudh Kaushik and Hiren Patel A Framework for Scheduling DRAM Memory Accesses for Multi-Core Mixed-time Critical Systems Mohamed Hassan, Hiren Patel and Rodolfo Pellizzoni A Predictable and Command-Level Priority- Based DRAM Controller for Mixed-Criticality Systems Hokeun Kim, David Broman, Edward A. Lee, Michael Zimmer, Aviral Shrivastava and Junkwang Oh