

# **2016 International Conference on Collaboration Technologies and Systems (CTS 2016)**

**Orlando, Florida, USA  
31 October 2016**



**IEEE Catalog Number: CFP1616A-POD  
ISBN: 978-1-5090-2301-1**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. 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:	CFP1616A-POD
ISBN (Print-On-Demand):	978-1-5090-3201-1
ISBN (Online):	978-1-5090-2300-4

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2016 International Conference on Collaboration Technologies and Systems CTS 2016

## Table of Contents

CTS 2016 Advisory and Organizing Committees .....	xiii
CTS 2016 International Technical Program Committee .....	xv
CTS 2016 Additional Reviewers .....	xvii
CTS 2016 Symposia, Workshops, and Special Sessions .....	xxi
CTS 2016 Preface .....	xxix
CTS 2016 Program Message .....	xxx
CTS 2016 Keynotes .....	xxxii
CTS 2016 Tutorials .....	xxxv
CTS 2016 Panel Sessions .....	xlvi
CTS 2016 Demo Sessions .....	lvi
CTS 2016 Doctoral Dissertation Colloquium .....	lxvi
CTS 2016 Poster Papers and Posters .....	lxvii
CTS 2016 Sponsors .....	lxix
CTS 2016 Exhibitors .....	lxxi

## Technical Papers

### Full Papers

Idea Management in Social Networks: A Study of how to Tap into the Ideas of Facebook Communities .....	3
<i>Jorge Saldivar, Florian Daniel, Fabio Casati, and Luca Cernuzzi</i>	
Using Social Media Presence for Alleviating Cold Start Problems in Privacy Protection .....	11
<i>Prijila Nair, Melody Moh, and Teng-Sheng Moh</i>	
Features for Ranking Tweets Based on Credibility and Newsworthiness .....	18
<i>Jacob Ross and Krishnaprasad Thirunarayan</i>	
What Makes People Bond?: A Study on Social Interactions and Common Life Points on Facebook .....	26
<i>Emanuel Sanchiz, Francisco Ibarra, Svetlana Nikitina, Marcos Báez, and Fabio Casati</i>	
Tweet Me and I'll Help You: Mapping Tweets for Emergency Operation Centers: The Case of Paris Attacks .....	31
<i>Teresa Onorati, Paloma Díaz, and Belén Carrión Recio</i>	

Co-Design for Harm Reduction Systems with Online Communities of Bodybuilding Steroid Users .....	35
<i>Konstantinos Papangelis, Alan Chamberlain, and Hai-Ning Liang</i>	
Speech Speed Awareness System for a Non-native Speaker .....	43
<i>Jiongda Xu, Wei Liao, and Tommo Inoue</i>	
Sharing, Communication, and Music Listening: A Diary Study of Technology Use by Pre-teens and Adolescents .....	51
<i>Michael Stewart, Deborah Tatar, and Steve Harrison</i>	
Collaborative Systems & Shared Economy (Uberization): Principles & Case Study .....	57
<i>Bertrand David, Rene Chalon, and Chuantao Yin</i>	
Virtual Worlds: Skill, Challenge and Desire for Uniqueness and Spending Money on Intangibles .....	64
<i>Angie M. Cox</i>	
Preliminary Notes on the Organizational and Management Implications of ICT Adoption.....	72
<i>Valeriano Balloni and Floriano Bonfigli</i>	
Towards a Road-Mapping Ontology for Open Innovation in Smart Manufacturing.....	77
<i>Nenad Ivezic and Miroslav Ljubicic</i>	
Idea Management Communities in the Wild: An Exploratory Study of 166 Online Communities .....	81
<i>Jorge Saldivar, Marcos Báez, Carlos Rodriguez, Gregorio Convertino, and Grzegorz Kowalik</i>	
Dynamic Design Intents Capture with Formal Ontology and Perdurants Object Concept for Collaborative Product Design .....	90
<i>Md Tarique Hasan Khan, Frédéric Demoly, and Kyoung Yun Kim</i>	
Designing Crowdsourcing Tasks with Consensus Constraints .....	97
<i>Silvana Castano, Alfio Ferrara, and Stefano Montanelli</i>	
A Scientific Data Provenance API for Distributed Applications.....	104
<i>Bibi Raju, Todd Elsethagen, Eric Stephan, and Kerstin Kleese Van Dam</i>	
Semantic Technology for Evidence Exploration and Learning (STEEL).....	112
<i>Perakath Benjamin, Dan Corlette, and Karthic Madanagopal</i>	
Semantic-Driven Goal-Oriented Development of AAL Environments.....	120
<i>Marco Cameranesi, Claudia Diamantini, Domenico Potena, and Emanuele Storti</i>	
Nerfs, Buffs and Bugs - Analysis of the Impact of Patching on League of Legends .....	128
<i>Artian Kica, Andrew La Manna, Lindsay O'Donnell, Tom Paolillo, Mark Claypool</i>	
Making Decisions in a Virtual Operating Room .....	136
<i>Catherine Pons Lelardeux, David Panzoli, Pierre Lagarrigue, and Jean-Pierre Jessel</i>	

Undesigned Cooperation within a Serious Game Observations during a Mechanical Engineering Course.....	143
<i>Victor Potier, Pierre Lagarrigue, Michele Lalanne, Catherine Pons Lelardeux, and Michel Galaup</i>	
The Impact of Role-Playing Games through <i>Second Life</i> on the Oral Practice of Linguistic and Discursive Sub-competences in English .....	148
<i>Eliana Quintín, Cecilia Sanz, and Alejandra Zangara</i>	
Discovery Lab Global: Accelerating Innovations... Growing Innovators.....	156
<i>Robert Williams</i>	
Community College STEM Pathways Guide: A Collaborative Online System for Design and Implementation of STEM Pathway Programs .....	158
<i>Caroline VanIngen-Dunn, Cynthia Pickering, Linda Coyle, Anita Grierson, Stephaine Frimer, and Verlyn Fick</i>	
Augmented Reality for Programming Teaching. Student Satisfaction Analysis .....	165
<i>Natali Salazar Mesia, Cecilia Sanz, and Gladys Gorga</i>	
ITCol. Tangible Interaction for Collaboration: Experiments Carried Out.....	172
<i>Artola Veronica, Sanz Cecilia, Pesado Patricia, and Baldassarri Sandra</i>	
Synchron-ITS: An Interactive Tutoring System to Teach Process Synchronization and Shared Memory Concepts in an Operating Systems Course.....	180
<i>Manoj Kumar Putchala and Adam R. Bryant</i>	
A Negation Handling Technique for Sentiment Analysis.....	188
<i>Claudia Diamantini, Alex Mircoli, and Domenico Potena</i>	
Enhancing Topic Detection in Twitter Using the Crowdsourcing Process.....	196
<i>Lobna Nassar, Rania Ibrahim, and Fakhri Karray</i>	
Recommending News Based on Hybrid User Profile, Popularity, Trends, and Location .....	204
<i>Suraj Natarajan and Melody Moh</i>	
Trajectory Segmentation Based on Spatio-Temporal Locality with Multidimensional Index Structures .....	212
<i>Yongjin Kwon, Junho Jin, Jinyoung Moon, Kyuchang Kang, and Jongyoul Park</i>	
Content Based Spam E-mail Filtering .....	218
<i>Pingchuan Liu and Teng-Sheng Moh</i>	
PeerAppear: A Location-Aware Framework for Extensible Image Annotation and Peer-to-Peer Discovery .....	225
<i>Andrew Compton, John Pecarina, and Noah Lesch</i>	
Interoperable Access to Video Content as a Basis for Collaborative Video Editing.....	233
<i>Christian Schenk, Sonja Schimmler, and Uwe M. Borghoff</i>	

Supporting Collaborative Information Seeking in Online Community Engagement .....	241
<i>Feng Sun, Ye Tian, and Guoray Cai</i>	
Image Feature Matching and Its Parallelization Using OpenMP.....	249
<i>Nupur Kohli and Teng-Sheng Moh</i>	
Designing a Unified Cloud Log Analytics Platform.....	257
<i>Maoyuan Sun, Gregorio Convertino, and Mark Detweiler</i>	
Be the Data: Social Meetings with Visual Analytics.....	267
<i>Xin Chen, Jessica Zeitz Self, Maoyuan Sun, Leanna House, and Chris North</i>	
High-Resolution Interactive and Collaborative Data Visualization Framework for Large-Scale Data Analysis .....	275
<i>Simon Su, Vincent Perry, Nicholas Cantner, Dylan Kobayashi, and Jason Leigh</i>	
Data Processing Toolset for the Virtual Watershed.....	281
<i>Lisa Palathingal, Rui Wu, Riad Belkhatir, Sergiu M. Dascalu, and Frederick C. Harris Jr.</i>	
Web-Based Visualization of Marine Environmental Data: Performance Analysis of a Matplotlib Implementation.....	288
<i>Joseph A. James, Teng-Sheng Moh, and Christopher A. Edwards</i>	
Connection Cartographer: Geographically Representing Host-Based Network Connections in Real-Time with a Focus on Usability .....	294
<i>Michael L. Duncan and Adam R. Bryant</i>	
A New Workflow to Interact with and Visualize Big Data for Web Applications.....	302
<i>Rui Wu, Jose T. Painumkal, Nimrat Randhawa, Lisa Palathingal, Sage R. Hiibel, Sergiu M. Dascalu, and Frederick C. Harris Jr.</i>	
Journaling Interfaces to Support Knowledge Workers in Their Collaborative Tasks and Goals .....	310
<i>Paul Jones, Sidharth Thakur, Sean Streck, and Chris Kampe</i>	
Augmented Reality-Based Groupware for Editing 3D Surfaces on Mobile Devices.....	319
<i>Andrés Cortés-Dávalos and Sonia Mendoza</i>	
Sketching Gesture-Based Applications in a Collaborative Working Environment with Wall-Sized Displays .....	327
<i>Marc Hesenius, Markus Kleffmann, and Volker Gruhn</i>	
Mathematical Modeling of Electrical Controlled Pneumatic Brake .....	N/A
<i>Yingze Yang, Lu Xiong, Zhiwu Huang, and Kuo-Chi Lin</i>	
A Consensus Control with Application to Heavy Haul Trains Based on Switched Hierarchical LQR.....	342
<i>Rui Zhang, Jun Peng, Weirong Liu, Bin Chen, Zhiwu Huang, and Jing Wang</i>	
Multi-Robot Cooperative Hunting.....	349
<i>He Shen, Ni Li, Salvador Rojas, and Lanchun Zhang</i>	

Software and Hardware Architectures in Cooperative Aerial and Ground Robots for Agricultural Disease Detection.....	354
<i>Pablo Menendez-Aponte, Christian Garcia, Douglas Freese, Sinem Defterli, and Yunjun Xu</i>	
Relinquishing Manual Control: Collaboration Requires the Capability to Understand Robot Intent .....	359
<i>Kristin E. Schaefer, Ralph W. Brewer, Joe Putney, Edward Mottern, Jeffrey Barghout, and Edward R. Straub</i>	
Renyi Divergence Based Distributed Particle Filter for Cooperative Object Tracking.....	N/A
<i>Wentao Yu, Junshan Tan, Aibin Chen, Xiaoyong Zhang, and Kuo-Chi Lin</i>	
Development of an Autonomous Ball-Picking Robot .....	373
<i>Karl Nicolaus, Jeremy Hooper, Richard Wood, and Chan Ham</i>	
Adaptive Kalman Filter Control Law for Visual Servoing.....	379
<i>Matthew Marshall and Harvey Lipkin</i>	
Immersive Telerobotics Using the Oculus Rift and the 5DT Ultra Data Glove .....	387
<i>Marvin A. Conn and Sharad Sharma</i>	
Tailigator: Cooperative System for Safety Distance Observance.....	392
<i>Cristina Olaverri-Monreal, Rene Lorenz, Florian Michaeler, Gerd Ch. Krizek, and Matthias Pichler</i>	
Analysis of a Payload-based Network Intrusion Detection System Using Pattern Recognition Processors.....	398
<i>Irshad M. Iqbal and Ricardo A. Calix</i>	
Collaborative Ensemble-Learning Based Intrusion Detection Systems for Clouds .....	404
<i>Poonam Mehetrey, Behrooz Shahriari, and Melody Moh</i>	
An FPGA Architecture for ASIC-FPGA Co-design to Streamline Processing of IDSs.....	412
<i>Tomoaki Sato, Sorawat Chivapreecha, Phichet Moungnoul, and Kohji Higuchi</i>	
Experts' Knowledge Merging to Reduce IDS Alerts Number .....	418
<i>Lydia Bouzar-Benlabiod, Lila Meziani, Abdelkrim Chebieb, Nacer-Eddine Rim, and Zakaria Mellal</i>	
On the Anatomy of the Dynamic Behavior of Polymorphic Viruses .....	424
<i>Armando Cabrera and Ricardo A. Calix</i>	
A Temporal Blockchain: A Formal Analysis .....	430
<i>Richard Dennis, Gareth Owenson, and Benjamin Aziz</i>	
RapIoT Toolkit: Rapid Prototyping of Collaborative Internet of Things Applications.....	438
<i>Simone Mora, Francesco Gianni, and Monica Divitini</i>	
Tele-Board Prototyper - Distributed 3D Modeling in a Web-Based Real-Time Collaboration System.....	446
<i>Matthias Wenzel, Adrian Klinger, and Christoph Meinel</i>	

Social Modeling for Multi-agent Systems .....	454
<i>Gita Sukthankar</i>	
Argumentation for Collaboration Among Internet of Things .....	455
<i>Henry Hexmoor</i>	
An Evolutionary Algorithm for an Agent-Based Fleet Simulation Focused on Electric Vehicles .....	457
<i>Benedikt Jäger, Christoph Hahn, and Markus Lienkamp</i>	
A Market Collaborative Agents-Based Framework for Information Retrieval .....	465
<i>Djamel Eddine Menacer and Nassima Guenaoui</i>	
Abstract Argumentations Using Voronoi Diagrams .....	472
<i>Ellie Lovellette and Henry Hexmoor</i>	
ShareEnergy: Configuring Mobile Relays to Extend Sensor Networks Lifetime Based on Residual Power .....	478
<i>Fu-Nan Huang, Tseng-Yi Chen, Shuo-Han Chen, Hsin-Wen Wei, Tsan-sheng Hsu, and Wei-Kuan Shih</i>	
Implementing MANET for Trustworthy Collaboration Using OSS and Android Based COTS Devices .....	485
<i>Ashfaq Ahmad Malik, Athar Mahboob, and Tariq Mairaj Khan</i>	
Smart Solutions for Smart Cities: Using Wireless Sensor Network for Smart Dumpster Management .....	493
<i>Sahar Idwan, Junaid Ahmed Zubairi, and Imran Mahmood</i>	
A Microservice-Based Architecture for the Development of Accessible, Crowdsensing-Based Mobility Platforms .....	498
<i>Andrea Melis, Silvia Mirri, Catia Prandi, Marco Prandini, and Paola Salomoni</i>	
The HEREiAM Tele-social-care Platform for Collaborative Management of Independent Living .....	506
<i>Silvia Macis, Daniela Loi, and Luigi Raffo</i>	
Reflections on the Research Methods Used in an Investigation of Cross-modal Collaborative Information Seeking .....	511
<i>Dena Al Thani and Tony Stockman</i>	
Big Data in the Clinic: Using Data to Guide Practice .....	518
<i>Elizabeth A. Krupinski</i>	
High Definition Live Interactive and Store and Forward Tele dermatology: A Comparison of Concordance, Confidence, and Satisfaction with In-person Exams .....	520
<i>Richard Marchell, Craig Locatis, and Michael Ackerman</i>	
Online Group-Exercises for Older Adults of Different Physical Abilities .....	524
<i>Marcos Báez, Francisco Ibarra, Iman Khaghani Far, Michela Ferron, and Fabio Casati</i>	

Telemedicine in the Apple App Store: An Exploratory Study of Tele dermatology Apps.....	534
<i>Matthias Kochmann and Craig Locatis</i>	
A Research Plan to Study Impact of a Collaborative Web Search Tool on Novice's Query Behavior .....	539
<i>Mareh Al-Sammarraie and Karthikeyan Umapathy</i>	
Enriching Play Experience across Multiple Platforms through Collaborative Real World Actions.....	545
<i>Christopher Malec and Sudhanshu Kumar Semwal</i>	
R&D Capabilities Predictability and Risk Control in Scrum Framework .....	551
<i>Kyriakos Tsoukalas</i>	

## Poster Papers

The Role of Social Media in National Discourse and Mobilization of Citizens.....	559
<i>Joseph Kwame Adjei</i>	
Collaboration in Computer Vision Using Scientific Workflows .....	564
<i>Kabir Chug and Ricky J. Sethi</i>	
A Scalable Secure Platform for Vehicular Cloud Computing .....	N/A
<i>Heshem A. El Zouka</i>	
Design of Architecture and Signal for Collaboration in Fixed & Mobile Convergence Network.....	574
<i>Hyun Soon Nam and No Ik Park</i>	
RCV: Network Monitoring and Diagnostic System with Interactive User Interface.....	578
<i>Soya Park, Ketan Talaulikar, and Chris Metz</i>	
Enhancing Capacity and Survivability on Ethernet Based Technique for LTE Network.....	N/A
<i>Fadli Sirait, Beny Nugraha, Fahraini Bacharudin, and Leonard N. M. Sitohang</i>	

## Doctoral Dissertation Colloquium Abstracts

Using a Value Sensitive Design Approach to Promote Adolescent Online Safety on Mobile Platforms .....	593
<i>Arup Kumar Ghosh</i>	
Body Ownership in Virtual Reality .....	597
<i>Sungchul Jung and Charles E. Hughes</i>	
Coordination in Spare Parts Supply Chains.....	601
<i>Philipp Saalman and Bernd Hellingrath</i>	

## Posters Abstracts

Improving the Local Disk Cover Algorithm for Placing Relay Nodes in a Wireless Sensor Network.....	607
<i>Shuo-Han Chen, Yen-Ting Chen, Yu-Pei Liang, Yong-Ching Lin, Heng-Yin Chen, and Wei-Kuan Shih</i>	

## Late Manuscripts

Social Media Analytics to Identify and Counter Islamist Extremism: Systematic Detection, Evaluation, and Challenging of Extremist Narratives Online.....	611
<i>I. Budak Arpinar, Ugur Kursuncu, and Dilshod Achilov</i>	
Internet of Things: Challenges and Opportunities for Collaborative Technologies .....	613
<i>Kien A. Hua</i>	
Training with Virtual Operating Room Teammates to Influence Team Behaviors .....	615
<i>Benjamin Lok</i>	
Breaking Down Silos to Promote Collaborative Reflection in Healthcare .....	617
<i>Gabriela Marcu</i>	
An Attribute-Based Statistic Model for Privacy Impact Assessment .....	619
<i>Yong Wang and Jun Liu</i>	
Sensemaking and Storytelling: Network Security Strategies for Collaborative Groups.....	622
<i>Elizabeth Anne Watkins, Franziska Roesner, Susan McGregor, Byron Lowens, Kelly Caine, and Mahdi Nasrullah Al-Ameen</i>	
<b>Author Index .....</b>	<b>625</b>