June 16–19, 2014
Bretton Woods, NH, USA

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MobiSys'14

Proceedings of the 12th Annual International Conference on Mobile Systems, Applications, and Services

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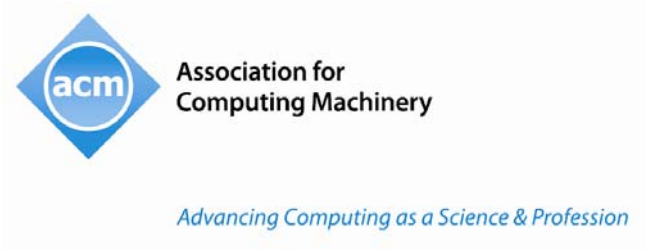

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ISBN: 978-1-4503-2793-0

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Printed in the USA

General Chairs' Welcome

As general chairs it is our great pleasure to welcome you to the 12th *International Conference on Mobile Systems, Applications, and Services – MobiSys'14* – and to the beautiful Mount Washington Hotel and Resort, located in Bretton Woods, New Hampshire. Since its inception in 2003, MobiSys has been the leading forum for mobile-systems research. The conference has a tradition of being highly interactive, including workshops on hot new topics, demos, posters and videos presenting early work or new technologies, a single-track paper program presenting the best research ideas in mobile computing, and a thought-provoking keynote.

We are excited to host this year's conference at the stunningly beautiful Mount Washington Hotel and Resort nestled in the White Mountains of New Hampshire. We have been honored to work with a superb team, working behind the scenes on behalf of the conference and our community. Key to the success of any technical conference is the quality, dedication, and leadership of the technical program chairs. We are very fortunate to have Landon Cox and Morley Mao at the helm of the committee this year. Landon and Morley are a pleasure to work with and we thank them and their technical program committee for putting together a stellar program of high-quality papers.

We are especially excited about our keynote speaker, James Landay, whose talk kicks off the technical program. He has held leadership positions at University of California Berkeley, University of Washington, and Intel Research Lab; he recently joined Cornell Tech in New York City. James is widely recognized as one of the key figures driving ubiquitous computing forward. His current research interests include automated usability evaluation, demonstrational interfaces, and user-interface design tools. We are very happy that James could join us at MobiSys this year.

Anyone who has chaired a conference knows that the key to success is having a great organizing committee. Perhaps the key person in the organization committee – a third general chair – is the Local Arrangements Chair. We offer our deep thanks to Guanling Chen for taking care of all the details that slipped through our fingers.

Speaking of details, we thank Andrés Molina-Markham, publication chair, for dealing with the many details in assembling the proceedings. His tireless work in dealing with all the paper, poster, video, and demo authors/chairs, and the publisher's pressing deadlines, has led to a great product.

Part of the MobiSys culture is the demonstration of new technologies and the informal presentation of work-in-progress. This year we have a large number of demos and posters. We would like to thank our demo and poster chairs Hong Lu and Souvik Sen for doing a terrific job and for keeping the spirit of MobiSys alive with these cutting-edge presentations.

Our workshop chairs Tristan Henderson and Xia Zhou have put together an outstanding set of four workshops: the *Ph.D. Forum* led by Andrius Aucinas, Aaron Yi Ding, Aarathi Prasad and Ardalan Amiri Sani; the *Workshop on Mobile Augmented Reality and Robotic Technology-based Systems* led by Mooi Choo Chuah and Pan Hui; the *Workshop on Physical Analytics* led by Deborah Estrin and Venkat Padmanabhan; and the *Workshop on Mobile Cloud Computing and Services* led by Lin Zhong and Yuvraj Agarwal. These four workshops, some new and some returning, should spark discussion on new challenges in mobile computing. Thank you Tristan, Xia and all the workshop organizers. MobiSys started an experimental new video program last year and we thank Deepak Ganesan and Ben Greenstein for organizing our video program.

Another critical task of running a top conference is making sure we come in on, or very near, budget. We enjoyed working with Jacob Sorber as our treasurer and finance chair; Jacob developed and managed the budget and kept us in check. Thank you Jacob!

Our publicity chair Minkyong Kim did a splendid job at getting the various calls out for the different parts of the meeting and being proactive in pushing us to get the word out early. If you like our website then you should thank our web chair Jing Xu who was super responsive at keeping the site current and looking great. Eduardo Cuervo did an outstanding job handling registration this year, with great attention to detail. Mount Washington Hotel is located over two hours from major airports, so we sought Tim Pierson's help providing attendees alternatives to renting a car. He organized a bus between two airports and the Mount Washington Hotel and partnered with ZimRide to create opportunities for attendees to share rides. Thank you Minkyong, Jing, Eduardo, and Tim!

MobiSys has a long tradition of fostering student participation. As chairs we have tried to keep the cost of student registrations as low as possible and continue to help provide student travel grants with the help of industrial supporters and National Science Foundation (NSF). Furthermore, we see the students participating in the conference and our Ph.D. Forum as tomorrow's leaders. We thank Ehsan Hoque for doing a tremendous job coordinating student travel grants. We thank Thyagarajan Nandagopal, who serves in the Division of Computer and Network Systems at NSF, for his assistance in obtaining NSF support for travel grants and for leading a discussion on large-scale infrastructure needs for research in mobile computing during the conference.

ACM and ACM SIGMOBILE are our proud sponsors, but a conference like MobiSys cannot be accomplished without help from many partners. We are deeply grateful for the financial support from Brocade, Facebook, Google, HP Labs, HTC, IBM Research, Intel, ISTS at Dartmouth, Microsoft, Nokia Research, NSF, and Telefonica. As a result of their generous support we can bring many students to MobiSys this year who would most likely not have been able to attend without this generous support for travel and registration.

Many people volunteer their time and energy to pull everything together, including our supportive steering committee members led by Victor Bahl. But the success of MobiSys is mainly due to the hard work of all those people who submit papers, demos, video and posters. We thank you all. On behalf of the whole team, welcome to Bretton Woods – enjoy the conference!

Andrew Campbell and David Kotz
MobiSys'14 General Chairs
Dartmouth College, USA

Program Chairs' Welcome

Welcome to MobiSys 2014, the 12th Conference on Mobile Systems, Applications, and Services.

This year's technical program covers a wide range of topics in mobile systems. The program both deepens our understanding of several long-standing problems and explores an expanding set of emerging mobile applications and technologies. Topics include automated user-interface exploration, efficient resource usage, gesture recognition, localization, privacy and security, wearable computing, wireless networks, and more.

We are thrilled to begin the technical program with a keynote talk by Professor James Landay of Cornell NYC Tech. Dr. Landay has been a leading researcher on human-computer interaction and ubiquitous computing for over twenty years. After the keynote, we have an exciting technical program that includes 25 full-length technical papers chosen by the technical program committee (TPC) from 185 submissions.

As interest in the conference has grown over the last several years, so too has the review load for MobiSys TPCs. To reduce the number of reviews each TPC member had to write, we augmented the TPC with an external review committee (ERC) of experts. Most ERC members reviewed six papers during the initial round of the review process.

Our review process consisted of three rounds of decisions. During the first round, all submissions received three or four reviews, each written by a member of the TPC or ERC. If a reviewer recommended that a paper be accepted, the paper advanced to the second round. During the second round, papers received three or four additional reviews, almost entirely from the TPC. At the end of the second round, reviewers discussed each remaining paper online to determine whether it should advance to the third round of decisions. The third round of decisions occurred during an all-day face-to-face meeting of the TPC. By the conclusion of this meeting, the TPC had identified the 25 papers in the program. Finally, all accepted papers were shepherded by a TPC member to ensure that the final manuscripts met the standards of the committee.

We took strict precautions throughout the review process to avoid conflicts of interest. Furthermore, as the TPC chairs, we did not submit papers to avoid conflicts of interest.

Creating the technical program for MobiSys 2014 was a team effort, and we would like to thank the TPC members, ERC members, and shepherds who worked extremely hard reading papers and providing feedback to paper authors. We would also like to thank the authors for sending us a pool of very high-quality submissions.

We are also grateful to our colleagues who helped organize the conference, including the steering committee, the poster and demo chairs (Hong Lu and Souvik Sen), the treasurer (Jacob Sorber), the publicity chair (Minkyong Kim), the publication chair (Andrés Molina-Markham), the workshop co-chairs (Tristan Henderson and Xia Zhou), the video-program co-chairs (Deepak Ganesan and Ben Greenstein), the transportation chair (Tim Pierson), the student-travel grants chair (M. Ehsan Hoque), the registration chair (Eduardo Cuervo), and the web chair (Jing Xu).

We would especially like to thank the general chairs, Andrew Campbell and David Kotz, and the local arrangements chair, Guanling Chen. Their handling of the conference logistics was invaluable. Finally, we thank our sponsors, ACM SIGMOBILE, and our supporters, Facebook, Google, HTC, Intel, Microsoft Research, Nokia, Telefonica, the National Science Foundation, Brocade, Dartmouth College, and Hewlett Packard. We hope that you will find the technical

program exciting and thought provoking, and that the conference will provide you with a valuable opportunity to share experiences and ideas with others from around the world.

Landon P. Cox
MobiSys '14 Program Co-Chair
Duke University, USA

Z. Morley Mao
MobiSys '14 Program Co-Chair
University of Michigan, USA

Table of Contents

MobiSys'14 Organization List xii

MobiSys'14 Sponsor & Supporters xiv

Keynote Address

- **Balancing Design and Technology to Tackle Global Grand Challenges** 1
  James Landay *(Cornell Tech)*

Session: Applications

- **BodyBeat: A Mobile System for Sensing Non-Speech Body Sounds** 2
  Tauhidur Rahman *(Cornell University)*, Alexander T. Adams *(University of North Carolina at Charlotte)*, Mi Zhang *(Cornell University)*, Erin Cherry *(University of Rochester)*, Bobby Zhou, Huaishu Peng, Tanzeem Choudhury *(Cornell University)*
- **Ubiquitous Keyboard for Small Mobile Devices: Harnessing Multipath Fading for Fine-Grained Keystroke Localization** 14
  Junjue Wang, Kaichen Zhao, Xinyu Zhang *(University of Wisconsin-Madison)*, Chunyi Peng *(The Ohio State University)*
- **Autodirective Audio Capturing Through a Synchronized Smartphone Array** 28
  Sanjib Sur, Teng Wei, Xinyu Zhang *(University of Wisconsin-Madison)*
- **Tracking Human Queues Using Single-Point Signal Monitoring** 42
  Yan Wang *(Stevens Institute of Technology)*, Jie Yang *(Oakland University)*, Yingying Chen *(Stevens Institute of Technology)*, Hongbo Liu *(Indiana University-Purdue University Indianapolis)*, Marco Gruteser, Richard P. Martin *(Rutgers University)*

Session: Wearable Computing

- **A Wearable System That Knows Who Wears It** 55
  Cory Cornelius *(Intel Labs)*, Ronald Peterson, Joseph Skinner, Ryan Halter, David Kotz *(Dartmouth College)*
- **Towards Wearable Cognitive Assistance** 68
  Kiryong Ha, Zhuo Chen, Wenlu Hu, Wolfgang Richter *(Carnegie Mellon University)*, Padmanabhan Pillai *(Intel Labs)*, Mahadev Satyanarayanan *(Carnegie Mellon University)*
- **iShadow: Design of a Wearable, Real-Time Mobile Gaze Tracker** 82
  Addison Mayberry, Pan Hu, Benjamin Marlin, Christopher Salthouse, Deepak Ganesan *(University of Massachusetts, Amherst)*

Session: Security

- **nShield: A Noninvasive NFC Security System for Mobile Devices** 95
  Ruogu Zhou, Guoliang Xing *(Michigan State University)*
- **Sensor-Assisted Facial Recognition: An Enhanced Biometric Authentication System for Smartphones** 109
  Shaxun Chen, Amit Pande, Prasant Mohapatra *(University of California Davis)*
- **MAdFraud: Investigating Ad Fraud in Android Applications** 123
  Jonathan Crussell, Ryan Stevens, Hao Chen *(University of California, Davis)*
- **EnCore: Private, Context-based Communication for Mobile Social Apps** 135
  Paarijaat Aditya, Viktor Erdélyi *(Max Planck Institute for Software Systems)*, Matthew Lentz, Elaine Shi, Bobby Bhattacharjee *(University of Maryland)*, Peter Druschel *(Max Planck Institute for Software Systems)*

Session: Gestures

- **RisQ: Recognizing Smoking Gestures with Inertial Sensors on a Wristband** 149
  Abhinav Parate *(University of Massachusetts, Amherst)*,
  Meng-Chieh Chiu, Chaniel Chadowitz, Deepak Ganesan, Evangelos Kalogerakis *(University of Massachusetts)*
- **An Energy Harvesting Wearable Ring Platform for Gesture Input on Surfaces** 162
  Jeremy Gummeson *(University of Massachusetts, Amherst & Microsoft Research)*,
  Bodhi Priyantha, Jie Liu *(Microsoft Research)*
- **User-Generated Free-Form Gestures for Authentication: Security and Memorability** 176
  Michael Sherman, Gradeigh Clark, Yulong Yang, Shridatt Sugrim *(Rutgers University)*,
  Arttu Modig *(University of Helsinki)*, Janne Lindqvist *(Rutgers University)*,
  Antti Oulasvirta *(Max Planck Institute for Informatics and Saarland University)*,
  Teemu Roos *(University of Helsinki)*

Session: UI Automation

- **Automatic and Scalable Fault Detection for Mobile Applications** 190
  Lenin Ravindranath *(Massachusetts Institute of Technology & Microsoft Research)*,
  Suman Nath, Jitendra Padhye *(Microsoft Research)*, Hari Balakrishnan *(Massachusetts Institute of Technology)*
- **PUMA: Programmable UI-Automation for Large-Scale Dynamic Analysis of Mobile Apps** 204
  Shuai Hao, Bin Liu *(University of Southern California)*, Suman Nath *(Microsoft Research)*,
  William G. J. Halfond, Ramesh Govindan *(University of Southern California)*

Session: Resource Usage

- **Characterizing Resource Usage for Mobile Web Browsing** 218
  Feng Qian, Subhabrata Sen, Oliver Spatscheck *(AT&T Labs - Research)*
- **Procrastinator: Pacing Mobile Apps' Usage of the Network** 232
  Lenin Ravindranath *(Massachusetts Institute of Technology)*,
  Sharad Agarwal, Jitendra Padhye *(Microsoft Research)*, Chris Riederer *(Columbia University)*
- **CoAST: Collaborative Application-Aware Scheduling of Last-Mile Cellular Traffic** 245
  Cong Shi *(Georgia Institute of Technology)*, Kaustubh Joshi, Rajesh K. Panta *(AT&T Labs - Research)*,
  Mostafa H. Ammar, Ellen W. Zegura *(Georgia Institute of Technology)*

Session: Performance

- **Rio: A System Solution for Sharing I/O between Mobile Systems** 259
  Ardalan Amiri Sani, Kevin Boos, Min Hong Yun, Lin Zhong *(Rice University)*
- **Real-Time Android with RTDroid** 273
  Yin Yan, Shaun Cosgrove, Varun Anand, Amit Kulkarni, Sree Harsha Konduri, Steven Y. Ko, Lukasz Ziarek
  (University at Buffalo, The State University of New York)
- **Enhancing Vehicular Internet Connectivity Using Whitespaces, Heterogeneity, and a Scouting Radio** 287
  Tan Zhang *(University of Wisconsin-Madison)*, Sayandeep Sen *(IBM Research India)*,
  Suman Banerjee *(University of Wisconsin-Madison)*

Session: Localization

- **COIN-GPS: Indoor Localization from Direct GPS Receiving** 301
  Shahriar Nirjon *(University of Virginia)*,
  Jie Liu, Gerald DeJean, Bodhi Priyantha, Yuzhe Jin, Ted Hart *(Microsoft Research)*
- **SAIL: Single Access Point-Based Indoor Localization** 315
  Alex Mariakakis *(University of Washington)*, Souvik Sen, Jeongkeun Lee, Kyu-Han Kim *(HP Labs)*
- **I am a Smartphone and I can Tell my User's Walking Direction** 329
  Nirupam Roy, He Wang, Romit Roy Choudhury *(University of Illinois at Urbana-Champaign)*

Session: Demonstrations

- **Demo: Rio – A System Solution for Sharing I/O between Mobile Systems** 343
  Ardalan Amiri Sani, Kevin Boos, Min Hong Yun, Lin Zhong *(Rice University)*
- **Demo: Open Data Kit 2.0 Tool Suite** 344
  Waylon Brunette, Samuel Sudar, Gaetano Borriello *(University of Washington)*
- **Demo: Kahawai – High-Quality Mobile Gaming Using GPU Offload** 345
  Eduardo Cuervo, Alec Wolman *(Microsoft Research)*, Landon Cox *(Duke University)*,
  Stefan Saroiu, Madanlal Musuvathi *(Microsoft Research)*, Ali Razeen *(Duke University)*
- **Demo: Real-time Object Tagging and Retrieval** 346
  Puneet Jain *(Duke University)*, Romit Roy Choudhury *(University of Illinois at Urbana-Champaign)*
- **Demo: DeLorean – Using Speculation to Enable Low-Latency Continuous Interaction for Mobile Cloud Gaming** 347
  Kyungmin Lee *(University of Michigan)*, David Chu, Eduardo Cuervo, Alec Wolman *(Microsoft Research)*,
  Jason Flinn *(University of Michigan)*
- **Demo: AuthPaper – Protecting Paper-based Documents/Credentials Using Authenticated 2D Barcodes** 348
  Chak Man Li, Pili Hu, Wing Cheong Lau *(The Chinese University of Hong Kong)*
- **Demo: A Remote Sensor Placement Device for Scalable and Precise Deployment of Sensor Networks** 349
  David Mascareñas, Logan Ott *(Los Alamos National Laboratory)*, Aaron Curtis *(New Mexico Tech)*,
  Sara Brambilla, Amy Larson, Steve Brumby, Charles Farrar *(Los Alamos National Laboratory)*
- **Demo: Hand-to-Hand Communication Using Smartphones** 350
  Keisuke Murase, Ryo Kanaoka *(Aoyama Gakuin University)*, Niwat Thepvilojanapong *(Mie University)*,
  Tsubasa Ito *(Aoyama Gakuin University)*, Teemu Leppänen *(University of Oulu)*, Hiroki Saito *(Meiji University)*,
  Yoshito Tobe *(Aoyama Gakuin University)*
- **Demo: Zero Interaction Private Messaging with ZIPR** 351
  Ali Razeen, Landon Cox *(Duke University)*
- **Demo: Mapping Global Mobile Performance Trends with Mobilyzer and MobiPerf** 353
  Sanae Rosen, Hongyi Yao, Ashkan Nikravesh, Yunhan Jia *(University of Michigan)*,
  David Choffnes *(Northeastern University)*, Z. Morley Mao *(University of Michigan)*
- **Demo: I am a Smartphone and I can Tell My User's Walking Direction** 354
  Nirupam Roy, He Wang, Romit Roy Choudhury *(University of Illinois at Urbana-Champaign)*
- **Demo: Ubiquitous Interaction with Smart Objects** 355
  Jan Rüth, Hanno Wirtz, Klaus Wehrle *(RWTH Aachen University)*
- **Demo: Protecting Visual Secrets with PrivateEye** 357
  Animesh Srivastava, Landon Cox *(Duke University)*
- **Demo: Crowd-Cache – Popular Content for Free** 358
  Kanchana Thilakarathna *(UNSW & NICTA)*, Fangzhou Jiang *(USYD & NICTA)*, Sirine Mrabet *(NICTA)*,
  Mohamed Ali Kaafar *(INRIA & NICTA)*, Aruna Seneviratne *(UNSW & NICTA)*,
  Prasant Mohapatra *(University of California, Davis)*
- **Demo: Yalut -- User-Centric Social Networking Overlay** 360
  Kanchana Thilakarathna *(UNSW & NICTA)*, Xinlong Guan *(NICTA)*, Aruna Seneviratne *(UNSW & NICTA)*
- **Demo: SaveAlert: Design for a Sensor-driven CrowdWatch Danger Detection System** ... 362
  Güliz Seray Tuncay, Kirill Varshavskiy, Robin Kravets *(University of Illinois at Urbana-Champaign)*
- **Demo: Recognizing Humans without Face Recognition** 364
  He Wang *(University of Illinois at Urbana-Champaign)*, Xuan Bao *(Samsung Research)*,
  Romit Roy Choudhury *(University of Illinois at Urbana-Champaign)*,
  Srihari Nelakuditi *(University of South Carolina)*

- **Demo: A Paper Keyboard for Mobile Devices** 364
  Junjue Wang, Kaichen Zhao, Xinyu Zhang *(University of Wisconsin-Madison)*,
  Chunyi Peng *(The Ohio State University)*
- **Demo: FaceBlock: Privacy-Aware Pictures for Google Glass** 366
  Roberto Yus *(University of Zaragoza)*,
  Primal Pappachan, Prajit Kumar Das *(University of Maryland, Baltimore County)*,
  Eduardo Mena *(University of Zaragoza)*, Anupam Joshi, Tim Finin *(University of Maryland, Baltimore County)*

Poster Session

- **Poster: A Robust Vehicular Accident Detection System using Inexpensive Portable Devices** 367
  Nicholas Capurso, Eric Elsken, Donnell Payne, Liran Ma *(Texas Christian University)*
- **Poster: SoftOffload – A Programmable Approach Toward Collaborative Mobile Traffic Offloading** 368
  Aaron Yi Ding *(University of Helsinki)*, Jon Crowcroft *(University of Cambridge)*,
  Sasu Tarkoma *(University of Helsinki)*
- **Poster: Semi-automatic Monitoring Vital Parameters of Mobile Users** 369
  Zhanwei Du, Yongjian Yang, Wu Liao, Linlu Liu, Lipeng Liu *(Jilin University)*
- **Poster: Motivating an Inter-networking Architecture for WSN/IoT** 370
  Laura Marie Feeney *(Swedish Institute of Computer Science)*
- **Poster: A Virtual Sensing Framework for Mobile Phones** 371
  Jon C. Hammer, Tingxin Yan *(University of Arkansas)*
- **Poster: M-Seven – Monitoring Smoking Event by Considering Time Sequence Information via iPhone M7 API** 372
  Bo-Jhang Ho, Mani B. Srivastava *(University of California, Los Angeles)*
- **Poster: Retro: An Automated, Application-Layer Record and Replay for Android** 373
  Taeyeon Ki, Satyaditya Munipalle, Karthik Dantu, Steven Y. Ko, Lukasz Ziarek
  (University at Buffalo, The State University of New York)
- **Poster: Enabling Computational Jewelry for mHealth Applications** 374
  Andres Molina-Markham, Ronald A. Peterson, Joseph Skinner, Ryan J. Halter *(Dartmouth College)*,
  Jacob Sorber *(Clemson University)*, David Kotz *(Dartmouth College)*
- **Poster: Scalable Evaluation for Wireless Mobile Systems** 376
  Soumendra Nanda, Brian DeCleene, Victor Firoiu, May Leung, Yingbo Song, Charles Tao *(BAE Systems)*
- **Poster: Towards Reducing Smartphone Application Delay through Read/Write Isolation** 378
  David T. Nguyen, Gang Zhou *(College of William and Mary)*, Guoliang Xing *(Michigan State University)*
- **Poster: Ontology-Based Heartbeat Classification for Mobile Electrocardiogram Monitoring** 379
  Juyoung Park, Kuyeon Lee, Kyungtae Kang *(Hanyang University)*
- **Poster: Balancing Disclosure and Utility of Personal Information** 380
  Aarathi Prasad, Xiaohui Liang, David Kotz *(Dartmouth College)*
- **Poster: DriveBlue – Can Bluetooth Enhance Your Driving Experience?** 382
  Ahmed Salem, Tamer Nadeem, Mecit Cetin *(Old Dominion University)*
- **Poster: A Power-Aware Mobile App for Field Scientists** 383
  Bo Wang, Xinghui Zhao, David Chiu *(Washington State University)*

- **Poster: Crowdsourcing for Video Traffic Surveillance** 384
  Hui Wen, Qiang Li *(Beijing Key Laboratory of IOT Information Security Technology)*,
  Qi Han *(Colorado School of Mines)*, Shiming Ge, Limin Sun *(Beijing Key Laboratory of IOT Information Security Technology)*
- **Poster: Improving Efficiency of Metropolitan-Scale Transit Systems with Multi-Mode Data Feeds** 385
  Desheng Zhang, Tian He *(University of Minnesota)*

Video Presentation Abstracts

- **Video: Rio – A System Solution for Sharing I/O between Mobile Systems** 386
  Ardalan Amiri Sani, Kevin Boos, Min Hong Yun, Lin Zhong *(Rice University)*
- **Video: WiFi-Honk – Smartphone-based Beacon Stuffed WiFi Car2X-Communication System for Vulnerable Road User Safety** 387
  Kaustubh Dhondge, Sejun Song, Younghwan Jang, Hyungbae Park, Sunae Shin, Baek-Young Choi *(University of Missouri - Kansas City)*
- **Video: Remote Sensor Placement** 388
  David Mascareñas, Sara Brambilla, Logan Ott, Amy Larson, Charles Farrar *(Los Alamos National Laboratory)*, Aaron Curtis *(New Mexico Tech)*, Steve Brumby *(Los Alamos National Laboratory)*
- **Video: Study of Storage Impact on Smartphone Application Delay** 389
  David T. Nguyen, Gang Zhou *(College of William and Mary)*, Guoliang Xing *(Michigan State University)*
- **Video: Procrastinator – Pacing Mobile Apps' Usage of the Network** 390
  Lenin Ravindranath *(Massachusetts Institute of Technology)*,
  Sharad Agarwal, Jitendra Padhye *(Microsoft Research)*, Chris Riederer *(Columbia University)*
- **Video: User-Generated Free-Form Gestures for Authentication: Security and Memorability** 391
  Michael Sherman, Gradeigh Clark, Yulong Yang, Shridatt Sugrim *(Rutgers University)*,
  Arttu Modig *(University of Helsinki)*, Janne Lindqvist *(Rutgers University)*,
  Antti Oulasvirta *(Max Planck Institute for Informatics and Saarland University)*,
  Teemu Roos *(University of Helsinki)*
- **Video: Open Data Kit Tables** 392
  Samuel Sudar, Waylon Brunette, Gaetano Borriello *(University of Washington)*
- **Video: Unsupervised Indoor Localization (UnLoc) – Beyond the Prototype** 393
  He Wang *(University of Illinois at Urbana-Champaign)*, Souvik Sen *(HP Labs)*,
  Alex Mariakakis *(University of Washington)*, Ahmed Elgohary *(University of Waterloo)*,
  Moustafa Farid, Moustafa Youssef *(EJUST)*,
  Romit Roy Choudhury *(University of Illinois at Urbana-Champaign)*

Author Index 395

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