MOBS 2013
Workshop on Engineering Mobile Enabled Systems

Organizers
Grace A. Lewis (CMU Software Engineering Institute, USA)
Jeff Gray (University of Alabama, USA)
Henry Muccini (University of L’Aquila, Italy)
Nachiappan Nagappan (Microsoft Research, USA)
David Rosenblum (National University of Singapore, Singapore)
Emad Shihab (Rochester Institute of Technology, USA)

ICSE 2013
San Francisco, CA USA
May 25, 2013
WELCOME

Grace A. Lewis
Carnegie Mellon Software Engineering Institute, USA
Motivation

- Mobile technologies are being integrated into enterprise systems and mission-critical systems as a way to collect data in the field
  - Data is produced, stored and used in the field
  - Shared between mobile and resident devices
  - Potentially uploaded to local servers or the cloud
- Creates a distributed, heterogeneous, context-aware, data production and consumption paradigm
Engineering Mobile-Enabled Systems

- Traditionally, mobile app development has been ad hoc, driven by short time-to-market schedules, small short-lived apps, and different economics.
- Larger-scale mobile-enabled systems require a much more mature development approach.
- Focus on software engineering and software architecture principles that promote important quality attributes:
  - Security, performance, battery optimization, and reliability on the mobile device.
  - Resilience, reliability, security, privacy and scalability on the enterprise side.
MOBS 2013 Workshop Goals

- Create a focal point and an ongoing forum for researchers and practitioners to share results and open issues in the area of software engineering of mobile-enabled systems
- Discuss the impact that mobility has on software engineering and how the software engineering research community can help address these and other relevant issues
- Create the initial set of principles for engineering mobile-enabled systems
Paper Submission and Review

- Every paper reviewed by at least three program committee members
- Out of the 16 submissions, 8 were accepted (50%)
- Papers cover a wide range of topics and were grouped into three sessions
  - Testing and Quality Assurance
  - Security and Privacy
  - Process
Represented Countries*

* Includes organizers, paper presenters and keynote

Created using Google Maps (http://maps.google.com)
Abstract Tag Cloud

Interesting Observations

Multiple tags related to “foundation elements”: data, environment, information, services, platform, resources, users

Multiple tags related to “quality aspects”: bugs, change, energy, moving, operations, power, quality, quality-in-use, rapid, responsiveness

Android tag is much larger than iOS
Workshop Logistics

- One keynote
- Three paper sessions
  - Very short paper presentations (15 minutes)
- Breakout Sessions
  - Card sorting to form groups
  - Group meetings
  - Plenary report
- We expect highly interactive sessions
- We will be taking notes throughout the workshop and post a summary on the MOBS 2013 web site: [http://www.sei.cmu.edu/community/mobs2013/](http://www.sei.cmu.edu/community/mobs2013/)
## Agenda — Morning

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<td>08:30 – 08:45</td>
<td>Welcome and Introductions</td>
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| 08:45 – 10:00 | Keynote: Making Smart Communities Resilient: Mobile to the Rescue  
**Martin Griss (Carnegie Mellon University - Silicon Valley, USA)** |
| 10:00 – 10:30 | Open Discussion                  |
| 10:30 – 11:00 | Coffee Break                     |
| 11:00 – 11:45 | Paper Session 1: Testing and Quality Assurance  
**Facilitator: Nachiappan Nagappan, Microsoft Research, USA**  
- A Model of Quality-in-Use for Service-based Mobile Ecosystem  
- A Comparison of Energy Bugs for Smartphone Platforms  
- Testing for Poor Responsiveness in Android Applications |
| 11:45 – 12:15 | Paper Session 2: Security and Privacy  
**Facilitator: Grace Lewis, CMU Software Engineering Institute, USA**  
- Comparing Privacy Control Methods for Smartphone Platforms  
- Securing Static Nodes in Mobile-Enabled Systems using a Network-Layer Moving Target Defense |
| 12:30 – 14:00 | Lunch                            |
## Agenda — Afternoon

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| 14:00 – 14:45 | **Paper Session 3: Process**  
  *Facilitator: Henry Muccini, University of L’Aquila, Italy*  
  - eMontage: An Architecture for Rapid Integration of Situational Awareness Data at the Edge  
  - Software Development Processes for Mobile Systems: Is Agile Really Taking Over the Business?  
  - A Framework and Ontology for Mobile Sensor Platforms in Home Health Management |
| 14:45 – 16:00 | **Open Discussion and Start of Break-Out Sessions**                     |
| 16:00 – 16:30 | **Coffee Break**                                                        |
| 16:30 – 17:00 | **Break-Out Sessions Continued**                                        |
| 17:00 – 18:00 | **Report of Break-Out Sessions and Wrap-Up**                            |
Special Thanks to our Program Committee!

Jeff Boleng, Carnegie Mellon Software Engineering Institute, USA
Massimiliano di Penta, RCOST - University of Sannio, Italy
Sean Eade, Siemens Corporate Research, USA
James Edmonson, Carnegie Mellon Software Engineering Institute, USA
Ahmed E. Hassan, Queen's University, Canada
Abram Hindle, University of Alberta, Canada
Patricia Lago, VU Amsterdam, The Netherlands
Wei Le, Rochester Institute of Technology, USA
Joseph Loyall, Raytheon BBN Technologies, USA
Ivano Malavolta, University of L'Aquila, Italy
Sam Malek, George Mason University, USA
Ali Mesbah, University of British Columbia, Canada
Leonardo Mostarda, Middlesex University, UK
Meiyappan Nagappan, Queen’s University, Canada
Iulian Neamtiu, University of California – Riverside, USA
Marc Novakouski, Carnegie Mellon Software Engineering Institute, USA
Chris Parnin, Georgia Institute of Technology, USA
Luigi Pomante, University of L'Aquila, Italy
Adam Porter, University of Maryland College Park, USA
Douglas Schmidt, Vanderbilt University, USA
Todd Sedano, Carnegie Mellon Silicon Valley, USA
Michael Smit, York University, Canada
Tao Xie, North Carolina State University, USA
Briefly state your name, organization, and areas of interest related to mobile-enabled systems
KEYNOTE: MAKING SMART COMMUNITIES RESILIENT: MOBILE TO THE RESCUE

Martin Griss
Carnegie Mellon University – Silicon Valley, USA
Martin Griss

- Director of the Silicon Valley Campus and director of the Disaster Management Initiative
- 40 years of academic and industrial experience
- Leads research in context-aware applications and software engineering, applying mobile, networking and sensor technology to disaster response
- Has published over 60 articles, book chapters and tutorials on mobile computing, software reuse, software agents and disaster response
Facilitator: Nachiappan Nagappan
Microsoft Research, USA

PAPER SESSION I:
TESTING AND QUALITY ASSURANCE
Testing and Quality Assurance

- As with all software systems, testing and quality are of significant importance. Two main problems that complicate this are:
  - Power/Energy availability
  - Monitoring and overhead: Bandwidth, Debugger

- In this section, we will see three papers that fit into the above two topics.
Papers

• A Model of Quality-in-Use for Service-based Mobile Ecosystem
  ◦ Hyun Jung La and Soo Dong Kim (Soongsil University, South Korea)

• A Comparison of Energy Bugs for Smartphone Platforms
  ◦ Jack Zhang, Ayemi Musa and Wei Le (Rochester Institute of Technology, USA)

• Testing for Poor Responsiveness in Android Applications
  ◦ Shengqian Yang, Dacong Yan and Atanas Rountev (Ohio State University, USA)
PAPER SESSION 2: SECURITY AND PRIVACY

Facilitator: Grace A. Lewis
Carnegie Mellon Software Engineering Institute, USA
Security and Privacy

- Security and privacy for mobile devices is a complex topic
  - Security solutions for mobile devices must defend against viruses, malware, botnets, intrusion attacks, threats from a wide spectrum of mobile applications, and attacks that are specific to mobile devices
  - Usage of sensor-gathered data creates privacy issues
  - IT organizations struggle with BYOD policies to prevent unauthorized access to enterprise systems and disclosure of sensitive content
  - Heterogeneous hardware and software platforms add another layer of complexity

- Two of many challenges will be discussed in this session
  - Does the iOS platform have better privacy control methods than Android?
  - How do we secure static nodes in mobile-enabled systems (MOBS)?
Papers

• Comparing Privacy Control Methods for Smartphone Platforms
  - Mohammed Alhamed, Khalid Amiri, Mansoor Omari and Wei Le (Rochester Institute of Technology, USA)

• Securing Static Nodes in Mobile-Enabled Systems using a Network-Layer Moving Target Defense
  - Stephen Groat, Reese Moore, Randy Marchany and Joe Tront (Virginia Tech, USA)
CARD SORTING SESSION

Facilitator: Jeff Gray
University of Alabama, USA
Process

• On the provided post-it note, write your name and what you believe is the most important principle for engineering mobile-enabled systems
• Place your post-it note either next to a related set of post-it notes or by itself if you see no relationship to existing post-it notes
• Feel free to walk around the room and merge or split groups – No hard feelings!
• The resulting groups will be the breakout groups for the afternoon
  ◦ If there are too many groups, the organizers will make executive decisions during lunch time
IEEE Software Special Issue on Next Generation Mobile Computing
Website: http://tinyurl.com/singmc2013
Submission Deadline: June 30, 2013
Publication: March/April 2014

For more information about the focus, contact the Guest Editors:
- James Edmondson (jredmondson@sei.cmu.edu), Carnegie Mellon Software Engineering Institute
- William Anderson, Carnegie Mellon Software Engineering Institute
- Joe Loyall, BBN
- Jeff Gray, University of Alabama
- Jules White, Virginia Tech
- Klaus Schmid, University of Hildesheim

For full author guidelines: www.computer.org/software/author.htm
For submission details: software@computer.org
To submit an article: https://mc.manuscriptcentral.com/sw-cs
Henry Muccini
University of L'Aquila, Italy

PAPER SESSION 3:
PROCESS
Process (and Architectures)

- New challenges for architecting MOBSs
  - **Data** collection and exchange, data mashup, interoperability
    - Mobile devices and WSNs produce and aggregate contextual data
    - Inputs from a diverse set of existing devices
    - Ontologies as a way to facilitate data exchange
  - Computation **distribution** and synchronization
    - Mini-cloud
    - All-on-the web approaches
  - **Middleware** supporting MOBS
  - Context awareness

- New Processes for MOBS
  - **Agile** processes
  - Needs of evidence
  - “Domain-specific” processes
  - “Domain-specific” standards
Papers

- **eMontage: An Architecture for Rapid Integration of Situational Awareness Data at the Edge**
  - Soumya Simanta, Gene Cahill and Edwin Morris (Carnegie Mellon Software Engineering Institute, USA)

- **Software Development Processes for Mobile Systems: Is Agile Really Taking Over the Business?**
  - Luis Corral, Alberto Sillitti and Giancarlo Succi (Free University of Bolzano, Italy)

- **A Framework and Ontology for Mobile Sensor Platforms in Home Health Management**
  - Mark Hennessy, Chris Oentojo and Steve Ray (Carnegie Mellon University - Silicon Valley, USA)
Process

- Get together with your group
- Give your group a name that represents the theme of your post-it notes
- Come up with 1-3 slides that represent your collective set of principles for engineering mobile-enabled systems related to your theme
- Provide your slides on a USB drive to one of the organizers
- Assign a presenter for the plenary session
WRAP-UP
Thanks for a Great Workshop!

- We plan on doing it again next year so start thinking about submissions
- We will submit a summary of the workshop to ACM Software Engineering Notes
  - We will give you credit for coming up with the first-ever set of principles for engineering mobile-enabled systems
- Presentations and summaries will be available on the MOBS web site soon
  - If you would like your presentation to be linked from the MOBS web site, please send a 1-up PDF file to Grace Lewis (glewis@sei.cmu.edu)