

Mirko Montanari

PhD Candidate, University of Illinois at Urbana-Champaign

704 W Nevada St, Apt 2
Urbana, IL 61801

+1 (949) 413 6310

✉ mmontan2@illinois.edu

🌐 srg.cs.illinois.edu/~mmontan2

Interests

Security monitoring, event-based systems, security policies.

Education

2007–current **PhD Candidate in Computer Science**, *University of Illinois at Urbana-Champaign*.

Dissertation Topic: Security of Policy-based Monitoring Systems

Advisor: Prof Roy H. Campbell; GPA: 4.0/4.0

Research work on security, distributed systems, and policy-based systems.

Expected Graduation: 05/13

2002–2006 **Laurea Specialistica (MS) in Computer Engineering**, *University of Bologna, Italy, 110/110 cum laude*.

Dissertation Topic: Development of a novel interface that uses the users' preferences to guide the interactive exploration of a set of structured data in an e-Commerce setting.

Advisors: Prof. Paolo Ciaccia, Prof. Sharad Mehrotra (UC Irvine), and Prof Nalini Venkatasubramanian (UC Irvine)

Research work on event-based systems, and database systems.

1999–2002 **Laurea (BS) in Computer Engineering**, *University of Bologna, Italy, 110/110 cum laude*.

Thesis Subject: Implementation of an algorithm for the estimation of upper bounds on the cardinality of materialized views in a data-warehouse.

Advisors: Prof. Paolo Ciaccia

Experience

2007–current **Graduate Research Assistant**, *University of Illinois at Urbana-Champaign*.

Developed and implemented a secure distributed monitoring system for cross-organization network infrastructure systems.

- Introduced a distributed reasoning algorithm for performing event-correlation across several hosts in order to increase security and scalability of monitoring. [5, 6, 8]
- Introduced techniques for reducing the information shared across organizations in multi-organizations systems. [4]
- Analyzed the application of policy monitoring and enforcement techniques in the area of cloud computing. [1, 3, 7]
- Applied the research results to the aerospace domain. Developed a framework for managing the security in airports and eEnabled aircrafts. [9]
- Designed and evaluated a replication system that provides reliable in-network data storage over unreliable wireless sensors using probabilistic models for failure prediction [11]

May '11– **Software Developer Engineer Intern**, *Amazon Web Services*, Seattle, WA.

Aug '11 *Supervisor:* Andrew Kiggings.

Developed systems related to security monitoring for DDoS attacks.

- May '08– **Boeing Research and Development Intern**, *Seattle, WA*.
 Aug '08 *Supervisor*: Scott Lintelman.
 Developed internal research proposals. The research projects regarded the application of formal methods on the security analysis of control systems, air traffic management and airplane health management.
- 2005–2007 **Junior Specialist**, *University of California, Irvine, Irvine, CA*.
Supervisors: Sharad Mehrotra and Nalini Venkatasubramanian.
 Implemented a policy-based all-hazard warning system for the dissemination of customized information about impending natural disasters [13] and developed algorithms for customized information dissemination in peer-to-peer pub/sub systems. [10]
- 2003–2006 **Co-founder**, *Void Labs S.N.C., – Software Development Company, Faenza, Italy*.
 Developed of a Java system for newsletter management.
- 2000–2003 **Java Software Developer**, *Impression S.p.A. , Faenza, Italy*.
 ○ Developed of Java applications for the analysis of website access logs.
 ○ Performance tuning of MySQL and Oracle databases for data warehouse applications

Teaching and Mentoring Experience

- Aug '12– **Teaching Assistant for Advanced Operating Systems**, *University of Illinois at Urbana-Champaign*.
 Dec '12 *Urbana-Champaign*.
 Organized and supported the graduate-level class Advanced Operating Systems (CS523). The class analyses open research problems in the area of Operating Systems.
 ○ Collaborated in the development of the class curriculum.
 ○ Prepared lectures and coordinated in-class discussions.
 ○ Supported students in the developed of term research projects.
- May '12– **Instructor for Distributed Systems**, *University of Illinois at Urbana-Champaign*.
 Aug '12 Instructor for the upper-level undergrad / grad class Distributed Systems (CS425).
 ○ Prepared and given 26 lectures over the course of the summer term on the fundamental concepts of Distributed Systems (principal results; middleware development; modern applications).
 ○ Managed a mixed class of grad / undergrad students 41 students: 21 onsite students, 20 online students
 ○ Developed assignments, programming problems, and term projects.
- Aug '11– **Coordinator for the Cloud Computing Seminar series**, *University of Illinois at Urbana-Champaign*.
 Dec '11 *Urbana-Champaign*.
 Coordinator and moderator for a graduate research seminar focused on discussing foundational and recent papers in the area of cloud computing (CS591ccr)
- 2009–current **Undergraduate student mentoring**, *University of Illinois at Urbana-Champaign*.
 Mentoring of 4 undergraduate students interested in security research. Collaborated in the development of research objectives and overseen their work.
- 2009–current **Coordinator for the Security Reading Group seminar**, *University of Illinois at Urbana-Champaign*.
 Coordinator for a graduate research seminar focused on discussing recent papers in top security conferences (CS591rhc).

Award and Honoraries

- Travel Scholarship, IEEE/IFIP Dependable Systems and Networks, 2012
- 1st rank out of 12, Siebel Center Computing Habitat Competition, 2009 Winning “Best Computing

- Habitat Project”, “most innovative use of new technologies”, and “Judge’s prize”
- Travel Scholarship, ACM Computer and Communication Security, 2009
 - Master thesis study-abroad Fellowship, University of Bologna, 2005

█ Languages

Italian	Native	English	Fluent
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█ Computer skills

Programming Languages	Java (J2EE), C/C++, Prolog, PHP, SQL, AWK,	IDEs and Libraries	Tomcat, Apache, Hadoop, OpenGL, NS-2 simulator, SVN
System Administration	Administration of multi-user Linux systems.	Database Systems	Management of MySQL and Oracle for data-warehouse.
Middleware	Web services, Java RMI, Jini		

█ Journal Articles and Book Chapters

- [1] Roy H. Campbell, **Mirko Montanari**, Reza Farivar, Middleware for Assured Clouds, **Journal of Internet Services and Applications**, 2011
- [2] Zahid Anwar, **Mirko Montanari**, Alejandro Gutierrez, and Roy H. Campbell, Budget constrained optimal security hardening of control networks for critical cyber-infrastructure, **International Journal of Critical Infrastructure Protection**, Volume 2, Issue 1-2, May 2009.

█ Conference and Workshop Publications

- [3] **Mirko Montanari**, Jun Ho Huh, Derek Dagit, Rakesh Bobba and Roy H. Campbell, Evidence of Log Integrity in Policy-based Security Monitoring, Workshop on Dependability of Clouds, Data Centers and Virtual Machine Technology (**DCDV**), in conjunction with IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2012
- [4] **Mirko Montanari**, Lucas T. Cook, Roy H. Campbell, Multi-Organization Policy-based Monitoring, IEEE International Symposium on Policies for Distributed Systems and Networks (**IEEE POLICY**), July 2012.
- [5] **Mirko Montanari**, Roy H. Campbell, Confidentiality of Event Data in Policy-based Monitoring, IEEE/IFIP International Conference on Dependable Systems and Networks (**DSN**), June 2012.
- [6] **Mirko Montanari**, Roy H. Campbell, Attack-resilient Compliance Monitoring for Large Distributed Infrastructure Systems, IEEE International Conference on Network and System Security (**NSS**), Sept 2011.
- [7] John Bellessa, Evan Kroske, Reza Farivar, **Mirko Montanari**, Kevin Larson, Roy H. Campbell, NetODESSA: Dynamic Policy Enforcement in Cloud Networks, 2011 30th IEEE Symposium on Reliable Distributed Systems Workshops (**SRDS Workshops**), 2011

- [8] **Mirko Montanari**, Ellick Chan, Kevin Larson, Wucherl Yoo, Roy H. Campbell, "Distributed Security Policy Conformance," **IFIP SEC**, Lucerne, Switzerland, June 2011.
- [9] **Mirko Montanari**, Roy H. Campbell, Krishna Sampigethaya, Mingyan Li, "A Security Policy Framework for eEnabled Fleets and Airports," **IEEE Aerospace Conference**, Big Sky, MT, March 2011
- [10] Hojjat Jafarpour, Sharad Mehrotra, Nalini Venkatasubramanian, and **Mirko Montanari**, MICS: An Efficient Content Space Representation Model for Publish/Subscribe Systems, ACM International Conference on Distributed Event-Based Systems (**DEBS**) 2009, Nashville, TN, USA, ACM, 2009.
- [11] Riccardo Crepaldi, **Mirko Montanari**, Indranil Gupta, and Robin Kravets, Using Failure Models for Controlling Data Availability in Wireless Sensor Networks, **INFOCOM Mini-Conference**, Brazil, IEEE, 2009.
- [12] **Mirko Montanari**, Roy H. Campbell, Multi-Aspect Security Configuration Assessment, Workshop on Assurable & Usable Security Configuration (**SafeConfig**), Collocated with ACM CCS 2009, ACM, Chicago, 2009
- [13] **Mirko Montanari**, Sharad Mehrotra, and Nalini Venkatasubramanian, Architecture for an Automatic Customized Warning System, IEEE International Conference on Intelligence and Security Informatics (**ISI**), New Brunswick, New Jersey, USA, 2007.

Published Demos and Posters

- [14] Riccardo Crepaldi, **Mirko Montanari**, Shayne Czyzewsky, Roy H. Campbell, and Robin Kravets, Event Detection Using Phenomenon Models, ACM / USENIX **MobiSys**, Kraków, Poland, ACM, 2009
- [15] Reza Farivar, **Mirko Montanari**, Ellick Chan, and Roy H. Campbell, An Automatic User Study Demo in Indoor Environments and Its Privacy Implications , IEEE International Conference on Pervasive Computing and Communications (**PerCom**), Galveston, Texas, USA, 2009