

*Leonardo Aniello*  
Curriculum Vitae  
(December 2014)

## Personal information

Email: [aniello@dis.uniroma1.it](mailto:aniello@dis.uniroma1.it) [leonardo.aniello@gmail.com](mailto:leonardo.aniello@gmail.com)

Nationality: Italian      Date and place of birth: 01 April 1981, Terni (TR), Italy

**Mother tongue:** Italian

**Other languages:** English (FCE: Grade A, Council of Europe Level B2)

## Current position

Temporary Research Fellow at *Research Center of Cyber Intelligence and Information Security* ([www.cis.uniroma1.it](http://www.cis.uniroma1.it)), Department of Computer and System Sciences "Antonio Ruberti", via Ariosto 25, 00185, Rome, Italy ([www.dis.uniroma1.it](http://www.dis.uniroma1.it)), "La Sapienza" University of Rome ([www.uniroma1.it/](http://www.uniroma1.it/)) (since January 2014)

## Activities

### Visiting

- Visiting Researcher at IBM Research Lab in Haifa (February, 1 - April, 30 2012) ([www.haifa.ibm.com](http://www.haifa.ibm.com))
- Visiting Researcher at Department of Computer Science at Royal Hollow University of London (15 May - 4 June 2013) ([www.rhul.ac.uk/computerscience](http://www.rhul.ac.uk/computerscience))

### PhD Schools

- METIS - CTDS'2011, How to Secure Distributed Systems? (Marrakech, April 27-29, 2011) ([www.notere-conf.org/METIS2011/](http://www.notere-conf.org/METIS2011/))
- SDCI 2012 - Winter School: Hot Topics in Secure and Dependable Computing for Critical Infrastructures (Cortina d'Ampezzo, January 15-19, 2012) ([www.dis.uniroma1.it/~dotslcci/](http://www.dis.uniroma1.it/~dotslcci/))

### Participation to conferences/workshops

- SAFECOMP 2011 - The 30th International Conference on Computer Safety, Reliability and Security (Naples, September 19-22, 2011) ([www.safecomp2011.unina.it/](http://www.safecomp2011.unina.it/))
- OPODIS 2012 – The 16th International Conference On Principles Of Distributed Systems (Rome, December 17-20, 2012) ([opodis2012.dis.uniroma1.it/](http://opodis2012.dis.uniroma1.it/))
- ACM SAC 2013 - The 28th ACM Symposium On Applied Computing (Coimbra, March 18-22, 2013) ([www.acm.org/conferences/sac/sac2013/](http://www.acm.org/conferences/sac/sac2013/))
- SRDS 2013 – The 32nd International Symposium on Reliable Distributed Systems (Braga, October 1-3, 2013) ([srds.di.uminho.pt/](http://srds.di.uminho.pt/))
- Netys 2014 – the 2nd International Conference on NETWORKED SYSTEMS (Marrakech, May 15-17, 2014) ([www.netys.net/](http://www.netys.net/))

## Publications

### Conferences

- L. Aniello, G. A. Di Luna, G. Lodi, and R. Baldoni: *A Collaborative Event Processing System for Protection of Critical Infrastructures From Cyber Attacks* (Safecomp 2011) DOI: 10.1007/978-3-642-24270-0\_23
- L. Aniello, L. Querzoni, R. Baldoni: *Input Data Organization for Batch Processing in Time Window Based Computations* (ACM SAC 2013) DOI: 10.1145/2480362.2480437
- L. Aniello, R. Baldoni, L. Querzoni: *Adaptive Online Scheduling in Storm* (ACM DEBS 2013) DOI: 10.1145/2488222.2488267
- L. Aniello, S. Bonomi, F. Lombardi, A. Zelli, R. Baldoni: *An Architecture for Automatic Scaling of Replicated Services* (Netys 2014) DOI: 10.1007/978-3-319-09581-3\_9
- L. Aniello, R. Baldoni, C. Ciccotelli, G. A. Di Luna, F. Frontali, L. Querzoni: *The Overlay Scan Attack: Inferring Topologies of Distributed Pub/Sub Systems through Broker Saturation* (ACM DEBS 2014) DOI: 10.1145/2611286.2611295

## Journals

- G. Lodi, L. Aniello, G. A. Di Luna, R. Baldoni: *An Event-Based Platform for Collaborative Threats Detection and Monitoring* (Information Systems, Volume 39, January 2014) DOI: 10.1016/j.is.2013.07.005
- L. Aniello, L. Querzoni, R. Baldoni: *High Frequency Batch-oriented Computations over Large Sliding Time Windows* (to appear in Future Generation Computer Systems, February 2015) DOI: 10.1016/j.future.2014.09.008

## Tutorials

- T. Heinze, L. Aniello, L. Querzoni, Z. Jerzak: *Tutorial: Cloud-based Data Stream Processing* (AMC DEBS 2014)

## Workshops

- L. Aniello, G. Lodi and R. Baldoni: *Inter-Domain Stealthy Port Scan Detection through Complex Event Processing* (EWDC 2011) DOI: 10.1145/1978582.1978597
- L. Aniello, S. Bonomi, M. Breno, R. Baldoni: *Assessing Data Availability of Cassandra in the Presence of non-accurate Membership* (DISCCO 2013) DOI: 10.1145/2506155.2506157
- L. Aniello, A. Bondavalli, A. Ceccarelli, C. Ciccotelli, M. Cinque, F. Frattini, A. Guzzo, A. Pecchia, A. Pugliese, L. Querzoni, S. Russo: *Big Data in Critical Infrastructures Security Monitoring: Challenges and Opportunities* (BIG4CIP 2014)

## Under revision

- M. Cinque, A. Pecchia, F. Frattini, S. Russo, L. Querzoni, L. Aniello, C. Ciccotelli, A. Ceccarelli, A. Bondavalli, A. Guzzo, A. Pugliese: *Big Data Analytics for Critical Infrastructures Protection: a Security Monitoring Framework* (submitted to the International Journal of Critical Computer-Based Systems)

## Technical reports

- L. Aniello, R. Baldoni, G. Chockler, G. Laventman, G. Lodi and Y. Vigfusson: *Agilis: An Internet-Scale Distributed Event Processing System for Collaborative Detection of Cyber Attacks* (MIDLAB Technical Report 04/2011)

## Book chapters

- contributions on three chapters of the book *Collaborative Financial Infrastructure Protection: Tools, Abstractions and Middleware* (published by Springer, February 2012)
  - *Cyber Attacks on Financial Critical Infrastructures* (M. Marchetti, M. Colajanni, M. Messori, L. Aniello and Y. Vigfusson) DOI: 10.1007/978-3-642-20420-3\_3
  - *Collaborative Inter-Domain Stealthy Port Scan Detection Using Esper Complex Event Processing* (L. Aniello, G. A. Di Luna, G. Lodi and R. Baldoni) DOI: 10.1007/978-3-642-20420-3\_7
  - *Distributed Attack Detection Using Agilis* (L. Aniello, R. Baldoni, G. Chockler, G. Laventman, G. Lodi and Y. Vigfusson) DOI: 10.1007/978-3-642-20420-3\_8

## **Research projects**

**CoMiFin** Communication Middleware for Monitoring Financial Critical Infrastructure (2008 - 2011) ([www.comifin.eu](http://www.comifin.eu)). EU project funded by the Seventh Framework Programme (FP7). The research area is Critical Infrastructure Protection (CIP), focusing on the Critical Financial Infrastructure (CFI).

**TENACE** Protecting National Critical Infrastructures from Cyber Threats (2013 - 2016) ([www.dis.uniroma1.it/~tenace](http://www.dis.uniroma1.it/~tenace)). Italian project funded by the Italian Ministry of Education, University and Research under the PRIN program. The overall goal is the protection of national Critical Infrastructures (CI) from cyber threats following a collaborative approach.

**DOTS-LCCI** Dependable Off-The-Shelf based middleware systems for Large-scale Complex Critical Infrastructures (2010 - 2012) ([dots-lcci.prin.dis.unina.it](http://dots-lcci.prin.dis.unina.it)). The project aims to define novel methods and techniques to assure and assess the resiliency level of current and future OTS-based LCCIs.

## Research interests

Distributed Event Processing. The distribution of the computation allows parallelizing the work in order to both achieve better performance and support the elaboration of massive data volumes, which is becoming a common requirement for today's applications. MapReduce is an emerging paradigm for distributed processing which addresses some interesting issues like locality awareness and large scale scalability. Hadoop is an open-source framework implementing MapReduce paradigm which I'm currently employing for carrying out several evaluations in the field of distributed event processing.

Intrusion Detection/Prevention Systems. As more and more systems are connected to the Internet, many security threats arise that would compromise both the operation of provided services and the reputation of service providers, as well as undermine finances and privacy of service customers. Such worrying situation requires the development of proper solutions for detecting, preventing and mitigating present cyber attacks. Current topics I'm focusing on are portscan detection and botnet detection.

Collaborative Environments. Sense and Respond systems are quite widespread. They first detect and correlate external events, that is the "sense" phase, and then produce on time useful outputs, that is the "respond" phase. According to the concept that the more I could sense, the better I would respond, what becomes crucial is the ability to gather a huge amount of data coming from several heterogeneous and distributed sources. A collaborative environment is aimed to support the required interactions between such sources, facing any related issue like the ones about interoperability and privacy. An interesting case study I'm concentrating on concerns with the collaboration of different financial institutions for improving their own defenses against cyber attacks.

## Teaching

### 2013/2014

- Distributed Systems ([www.dis.uniroma1.it/~baldoni/distributedsystems2013.php](http://www.dis.uniroma1.it/~baldoni/distributedsystems2013.php)):  
*Amazon's Dynamo, Google's BigTable*
- Distributed Systems Seminars ([www.dis.uniroma1.it/~baldoni/semsd2014.php?lang=ita](http://www.dis.uniroma1.it/~baldoni/semsd2014.php?lang=ita)):  
*storage management in Hadoop for time window computations*
- Elective in Computer Networks ([www.dis.uniroma1.it/~becchett/Elective/elective.html](http://www.dis.uniroma1.it/~becchett/Elective/elective.html)):  
*privacy in collaborative environments*

### 2012/2013

- Distributed Systems ([www.dis.uniroma1.it/~baldoni/distributedsystems2013.php](http://www.dis.uniroma1.it/~baldoni/distributedsystems2013.php)):  
*Amazon's Dynamo, Google's BigTable*
- Elective in Architecture and Distributed Systems ([www.dis.uniroma1.it/~querzoni/teaching/...](http://www.dis.uniroma1.it/~querzoni/teaching/...)):  
*Amazon's Dynamo, Google's BigTable*
- Distributed Systems Seminars ([www.dis.uniroma1.it/~baldoni/3ff32a3dd753664.php](http://www.dis.uniroma1.it/~baldoni/3ff32a3dd753664.php)):  
*storage management in Hadoop for time window computations*

### 2011/2012

- Elective in Architecture and Distributed Systems ([www.dis.uniroma1.it/~querzoni/teaching/...](http://www.dis.uniroma1.it/~querzoni/teaching/...)):  
*port scan detection techniques*
- Distributed Systems Seminars ([www.dis.uniroma1.it/~baldoni/SemSD2012.htm](http://www.dis.uniroma1.it/~baldoni/SemSD2012.htm)):  
*storage management in Hadoop for time window computations*

### 2010/2011

- Distributed Systems Seminars ([www.dis.uniroma1.it/~baldoni/SemSD2011.htm](http://www.dis.uniroma1.it/~baldoni/SemSD2011.htm)):  
*port scan detection techniques*

## Education and training

Ph.D. Student at “La Sapienza” University of Rome (November 2010 – October 2013). Dissertation title: “Timely Processing of Big Data in Collaborative Large-Scale Distributed Systems”. Advisor: Prof. Roberto Baldoni.

Master's Degree in Computer Engineering at “La Sapienza” University of Rome (October 2010). Dissertation title: “A contract-based event-driven model for cooperative environments: the case of collaborative security”. Supervisor: Prof. Roberto Baldoni. Final grade: 110/110 cum laude.

Bachelor's Degree in Computer Engineering at “La Sapienza” University of Rome (December 2003). Dissertation title: “A System for Automatic Project Assignment”. Supervisor: Prof. Fabrizio d’Amore. Final grade: 110/110 cum laude.

## Work experiences

Sistematica S.p.A., via Bramante 43, 05100, Terni (TR), Italy ([www.grupposistematica.it](http://www.grupposistematica.it))

- February 2004 – July 2005: design and development of the client side of a system for storing and managing data received by satellite, in the context of Cosmo SkyMed project ([www.cosmo-skymed.it](http://www.cosmo-skymed.it))
- April 2007 – December 2007: analysis, design and development of a distributed system for the management of both lift maintenance and spot display inside lifts
- January 2008 – March 2009: analysis, design and development of a monitoring system of Italian dams ([www.registroitalianodighe.it](http://www.registroitalianodighe.it))

E-VOLVING Business Integration, via del Maglio 6, 05100, Terni (TR), Italy ([www.e-volving.it](http://www.e-volving.it))

- July 2006 – December 2006: analysis, design and development of a web application for invoices management for a well-known Italian company

Autorizzo il trattamento dei dati personali contenuti nel mio curriculum vitae in base art. 13 del D. Lgs. 196/2003