

Angelo Tommaso Capossele

Ph.D.

Experience

- 10/2014–
current **Post-doc Researcher**, *University of Rome "La Sapienza"*.
The goal of my current research is to design a management framework for the Internet of Things (IoT) based on Software Defined Network (SDN) concepts that are fully integrated into an IoT standard stack. My research is also focused on the development of security protocols and cryptographic primitives for IoT, Wireless Sensor Networks with Wake-up radios, and Underwater Acoustic Sensor Networks (UASN) from link layer to application layer.
Teaching activities:
 - IoT Laboratory;
 - Wireless Systems Laboratory;
 - Computer Networks;
- 09/2015–
11/2015 **Visiting Post-doc Researcher**, *Northeastern University, Boston MA*.
The goal of my research as a Post-Doc visitor is to study and review management frameworks for the Internet of Things (IoT) based on Software Defined Network (SDN) concepts.
- 11/2013–
09/2014 **Security Engineer/Researcher**, *Nexse Software Engineering, Rome*.
Development of security solutions for Underwater Sensor Networks and Software Defined Networks (SDN). Specifically, as active member of the European project FP7 SUNRISE, I am involved in designing solutions in the area of cyber physical systems.

- 10/2009– **Security Engineer/Researcher**, *"Sapienza" University of Rome*.
- 10/2013 As a member of Cyber Intelligence and Information Security (CIS), I am involved in several European and Italian projects with up to 18 millions euros as budget and more than 30 partners from both university and industrial environment.
- Activities and achievements on major projects:
- ARTEMIS project #1000128 CHIRON (Cyclic and person-centric Health management: Integrated appRoach for hOme, mobile and clinical eNvironments). Activities of technological innovation in different areas: Authentication, Authorization and Accounting (AAA), Security, Privacy;
 - PRIN project TENACE: protection of national critical infrastructures from cyber threats, addressing three scenarios: financial infrastructures, power grid and transportation systems. Activities on vulnerability assessment, risk analysis, review of Cyber Security Governance and policies according to industrial standard (ISO 27000), designing innovative security solutions (key management, digital signature, cryptographic protocols);
 - FP7 project GENESI (GrEen sensor NEtworks for Structural monitoring). Activities on designing communication protocols for large scale heterogeneous wireless sensor/actuator networks enforcing security mechanisms by exploiting energy harvesting capabilities.
- 09/2006– **Network Security Administrator**, *University of Cagliari*.
- 03/2007 As an internship position, main activities are:
- Designing and implementation of an IT lab for up to 100 users;
 - Maintaining and configuring network devices (Router, Switch, Firewall);
 - Enhancing security policies;
 - Configuring VPN networks;

Research Fellowships

- 10/2015– **Borsa di Ricerca**, *C.S. Dept. University of Rome "La Sapienza"*, (BE 15/2015).
current Sviluppo ed implementazione di protocolli di sicurezza per reti di sensori con wake up radio.
- 10/2014– **Assegno di Ricerca**, *C.S. Dept. University of Rome "La Sapienza"*, (BE 06/2014).
09/2015 Definizione, implementazione e test di soluzioni per garantire la sicurezza delle comunicazioni sottomarine (WP4 e WP5 del progetto CIS FP7 SUNRISE).
- 03/2014– **Borsa di Ricerca**, *C.S. Dept. University of Rome "La Sapienza"*, (BE 09/2014).
08/2014 Implementazione e test di protocolli innovativi per la comunicazione sicura in reti di sensori sottomarine.
- 05/2010– **Assegno di Ricerca**, *C.S. Dept. University of Rome "La Sapienza"*, (BE 02/2010).
04/2011 Sviluppo di soluzioni di sicurezza per reti di sensori.

Education

- 2010–2013 **PhD**, *University of Rome "La Sapienza"*.
Computer Science: Security
- 2007–2009 **Master Degree**, *University of Rome "La Sapienza"*, *Cum Laude*.
Computer Science: Security
- 2004–2007 **Bachelor Degree**, *University of Cagliari*, *Cum Laude*.
Computer Science

PhD Research School

- 05/2011 PhD course: "Topics in Wireless Networks Security". University of Milan.

PhD thesis

- Title *Green Wireless Sensor Networks Security*
- Supervisor Professor Chiara Petrioli
- Description The dissertation investigates efficient and flexible security negotiation protocols by using different public key cryptography protocols (RSA, ECC and IBE) for Wireless Sensor Networks. Furthermore presents the design and the implementation of a low-cost digital signature algorithm based on ECDSA and a context-aware decentralized data access control. The thesis introduces the exploitation of harvested energy for security protocols.

Professional certifications

- 10/2008 Cisco IPS Specialist
- 10/2007 Cisco Firewall Specialist
- 07/2007 Cisco Information Security Specialist
- 07/2007 Information System Security (INFOSEC) Professional 4011
- 09/2006 Cisco Certified Network Associate (CCNA)

Languages

- Italian Mother tongue
- English Fluent in written/spoken

Technical skills

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|-------------|--|------------|--|
| Security | Cryptography, TLS, PKI; | SDN | OpenFlow, POX, Trema; |
| IoT | CoAP, 6LoWPAN, 802.15.4; | Mobile/WSN | Android, TinyOS, Contiki; |
| Programming | C, Java, nesC, Python, Ruby, PHP, HTML, sql; | OS | Windows (NT,XP,2003 server,7,8), Linux based, OSX (10.3-10.8); |

Awards

- o One of the winners of CLUSIT's best thesis prize 5th edition

Publications

G. Ateniese, G. Bianchi, A. T. Capossele, and C. Petrioli. Low-cost Standard Signatures in Wireless Sensor Networks: A Case for Reviving Pre-computation Techniques? In *Proceedings of the 20th Annual Network & Distributed System Security Symposium, NDSS 2013*, 2013.

Giuseppe Ateniese, Angelo T. Capossele, Petrika Gjanci, Chiara Petrioli, and Daniele Spaccini. SecFUN: Security Framework for Underwater acoustic sensor Networks. In *Proceedings of MTS/IEEE OCEANS - Genova, 2015*, pages 1–9, May 2015.

G. Bianchi, A. T. Capossele, A. Mei, and C. Petrioli. Flexible key exchange negotiation for wireless sensor networks. In *Proceedings of the fifth ACM international*

workshop on Wireless network testbeds, experimental evaluation and characterization, pages 55–62. ACM, 2010.

G. Bianchi, A. T. Caposese, C. Petrioli, and D. Spenza. AGREE: exploiting energy harvesting to support data-centric access control in WSNs. *Elsevier, Ad Hoc Networks*, 11(8):2625 – 2636, 2013.

A. T. Caposese, V. Cervo, G. De Cicco, and C. Petrioli. Security as a CoAP resource: an optimized DTLS implementation for the IoT. In *Proceedings of the IEEE International Conference on Communications, ICC 2015*, June 2015.

Angelo Caposese, Valerio Cervo, Chiara Petrioli, and Dora Spenza. Counteracting denial-of-sleep attacks in wake-up-based sensing systems. In *Proceedings of IEEE SECON 2016*, London, June 2016.

Angelo Caposese, Gianluca De Cicco, and Chiara Petrioli. R-CARP: A Reputation Based Channel Aware Routing Protocol for Underwater Acoustic Sensor Networks. In *Proceedings of ACM WUWNet 2015*, Washington DC, USA, October 22-24 2015.

Savio Sciancalepore, Angelo Caposese, Giuseppe Piro, Gennaro Boggia, and Giuseppe Bianchi. Key Management Protocol with Implicit Certificates for IoT Systems. In *Proceedings of the 2015 Workshop on IoT Challenges in Mobile and Industrial Systems*, ACM IoT-Sys '15, pages 37–42, 2015.

Savio Sciancalepore, Angelo Caposese, Giuseppe Piro, Gennaro Boggia, and Giuseppe Bianchi. On the Design of Lightweight Link-layer Security Mechanisms in IoT Systems. In *Proceedings of 12th Italian Networking Workshop*, January 14'16 2015.

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