

# Daniele Antonioli

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Google scholar: RkX4eFsAAAAJ, Last CV update: March 10, 2019

## Summary

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- PhD Candidate 2015-2019 at Singapore University of Technology and Design (SUTD)
- I'm currently interested in:
  - *Cyber-physical systems security* [1, 2, 3, 4], e.g., simulation/emulation, attacks, defenses, gamification
  - *Wireless systems security* [5, 6], e.g. physical layer security, security evaluations of deployed technologies
  - *Embedded systems and applied cryptography* [7, 8], e.g. industrial, legacy and RISC devices

## Service

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- IEEE Transactions on Information Forensics and Security (T-IFS) since 2017

## Awards

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- Singaporean Presidential Graduate Fellowship (PFG) 2015-2019
- Research excellence award by ST Engineering 2017 (see [2])
- Foundations of Security Analysis and Design (FOSAD) Summer School Scholarship 2016
- UniBO Overseas Master Thesis Scholarship (research in the USA) 2012

## Education

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<b>PhD in CS at Singapore University of Technology and Design (SUTD)</b> <i>Cyber-Physical Systems Security, Wireless Security, Adv: N.O. Tippenhauer</i>	<b>Sept 2015–Present</b> <i>GPA: 4.90/5.00</i>
<b>MS in Electronics and Telecom Engineering at University of Bologna</b> <i>Thesis: Hardware Testing of RNG, Adv: R. Rovatti, W. Burleson</i>	<b>Sept 2010–Mar 2013</b> <i>Grade: 110/110</i>
<b>BS in Electronics and Telecom Engineering at University of Bologna</b> <i>Thesis: Principles and Evolution of Radio Imaging, Adv: C. Lamberti</i>	<b>Sept 2006–Mar 2010</b> <i>Grade: 91/110</i>
<b>High School Diploma at Liceo Scientifico G. Marconi, Italy</b> <i>Science specialisation</i>	<b>Sept 2000–Jul 2006</b> <i>Grade: 98/100</i>

## Research Experience

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<b>RA for Helmholtz Center for Information Security (CISPA), DE</b> <i>Wireless Systems Security, Adv: N.O. Tippenhauer</i>	<b>Aug 2018–Jun 2019</b>
<b>RA for Dept of Computer Science University of Oxford, UK</b> <i>Protocols and Systems Security, Adv: K.B. Rasmussen</i>	<b>Jan 2018–Jul 2018</b>
<b>RA for iTrust Research Centre at SUTD, Singapore</b> <i>Cyber-Physical Systems Security, Adv: N.O. Tippenhauer</i> <ul style="list-style-type: none"><li>○ Design Implementation and Maintenance of MiniCPS [3].</li><li>○ Collaborate on scy-phy related projects and events.</li></ul>	<b>Feb 2015–Sept 2015</b>
<b>RA for VLSI Circuits and Systems Group at UMass, Amherst</b> <i>Hardware Testing and Security, Adv: W. Burleson, V. Suresh</i>	<b>Oct 2012–Dec 2012</b>

- Work on Master thesis and related e-book [9].
- Publish lightweight on-chip implementation of reduced NIST randomness test suite [8]

## Teaching Experience

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**TA for Security Principles (SPR) at University of Oxford, UK** **Summer 2018**

*Instructor: Prof. K.B. Rasmussen*

- Responsible for the exercises and presentation of Scyther
- Topics: CIA, Authentication, Cryptography, RSA, Protocols

**TA for 50.012 Networks at SUTD, Singapore** **Fall 2017**

*Instructor: Prof. N.O. Tippenhauer*

- Manage weekly lab session, grading of homeworks, office hours for 30 students.
- Topics: Internet, TCP/IP, UDP, BGP, SDN, HTTP, REST API, TLS, tunnels, NAT, embedded networks

**TA for 50.020 Security at SUTD, Singapore** **Spring 2017**

*Instructor: Prof. N.O. Tippenhauer*

- Manage weekly lab session, grading of homeworks, office hours for 30 students.
- Topics: sym/asym crypto, BOF, TLS, CTF, hashing, XSS, input validation, code injection, MitM.

**Private Teacher, Italy** **Jan 2013–Jan 2015**

*Audience: Grad, Undergrad, and High school students*

- Grad/undergrad: linear algebra, calculus, programming (C, Pascal).
- High school: math, physics, programming (C++).

**CS External Commissioner Prof for High School Final Exams, Italy** **Jun 2013–Jul 2013**

*Institutes: ITIS Urbino, ITI Don Orione*

- Grade written exams prepared by MIUR, oral interviews and grade assignment for 40 students.
- Topics: LAMP stack, SQL, design and implementation of relational DB, MVC paradigm, HTTP(S).

## Industry Experience

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**Chief of Transportation and Logistics for FIG World Cup, Italy** **Apr 2013**

*Adv: Colombo F, Porfiri P*

- Plan and manage transportation services for 43 International Delegations and Press.
- Coordinate a senior team of drivers, MGMT of facilities, cash fund, lost property and meals plan.

**Intern Clinical Engineer at Infermi Hospital Rimini, Italy** **Apr 2010–Jul 2010**

*Adv: Camillini R.*

- Study and measurement about the safety of optical radiations [10].
- Lab activity, Logistics, Electrical Checks and inspections in various departments of the hospital.

## Self Learning

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**Unix tools by University of Cambridge** **2017**

*Instructor: Kuhn M. Topics*

**Learning How to Learn by UCSD (Coursera)** **2014**

*Instructors: Sejnowsky T., Oakley B. Topics*

**Hardware/Software Interface by Washington University (Coursera)** **2014**

*Instructors: Borriello G., Ceze L. Certificate with Distinction*

**Entrepreneurship 101: Who is your customer? by MITx (edX)** **2014**

*Instructor: Aulet B.,*

**Cryptography Part 1 by Stanford University (Coursera)** **2013**

*Instructor: Boneh D. Topics Certificate with Distinction*

**Algorithms Part 1 by Princeton University (Coursera)** **2013**

*Instructors: Wayne K., Sedgewick R Topics*

## Languages

**Italian:** Native

**English:** Professional proficiency: TOEFL iBT: 94 (2013). B-2 CEFR (2012)

**Spanish:** Elementary proficiency

## Skills

**Programming:** object-oriented, procedural, trait-oriented, test-driven

**Langs:** Pythons, C, Rust, SQL, bash, C++, Java, Octave/MATLAB, Mathematica, VHDL, spice

**Architectures:** x86, amd64, ARM

**Pentest:** SQLi, Fuzzing, MitM, BOF, ROP

**Tools:** unix, vim, git, tmux, make, inkscape, gpg

**Markup:** md,  $\LaTeX$ , rst, toml

## Events and Talks

**Invited talk by Prof Conti's SPRITZ group at the University of Padova**

**Summer 2017**

*Towards high-interaction virtual honeypots in-a-box and MiniCPS.*

**SMART MIT/ETH/NUS/SUTD Workshop at NUS CREATE Tower (Singapore)**

**2017**

*Mentoring six grad students for the track of cyber-security policies. ADAPT research paper.*

**SGCSC Cybersecurity Camp at NUS (Singapore)**

**2017**

*Instructors: Liang Z., Roychoudhury A. Directed fuzzing LibPNG with peach and Binutils with afl*

**SCy-Phy Systems Week at SUTD (iTrust, Singapore)**

**2015, 2016, 2017**

*SWaT Security Showdown (S3) CTF and testbed experiments. Technical talks.*

**FOSAD International Summer School at Bertinoro (Italy)**

**Summer 2016**

*Foundations of Security Analysis and Design. Selected with scholarship.*

## Misc

**Sports:** Soccer, Swimming, Basketball

**Hobbies:** Dog owner, Traveling, Nature, Food

**Events:** Concerts, Museums, Art, Sport

**Music:** R&R, Amateur guitar player, Vinyl collector

## Publications

- [1] Daniele Antonioli, Hamid Reza Ghaeini, Sridhar Adepu, Martín Ochoa, and Nils Ole Tippenhauer. Gamifying ics security training and research: Design, implementation, and results of s3. In *Proceedings of Workshop on Cyber-Physical Systems Security & Privacy (co-located with CCS)*, November 2017.
- [2] Daniele Antonioli, Anand Agrawal, and Nils Ole Tippenhauer. Towards high-interaction virtual ICS honeypots-in-a-box. In *Proceedings of the 2nd ACM Workshop on Cyber-Physical Systems Security and Privacy (co-located with CCS)*, pages 13–22. ACM, 2016. <https://dl.acm.org/citation.cfm?id=2994493> **Research excellence award by ST Engineering at FIRST workshop 2017.**
- [3] Daniele Antonioli and Nils Ole Tippenhauer. Minicps: A toolkit for security research on CPS networks. In *Proceedings of the First ACM Workshop on Cyber-Physical Systems-Security and/or Privacy (co-located with CCS)*, pages 91–100. ACM, 2015. <https://arxiv.org/pdf/1507.04860>, Repo: <https://github.com/scy-phy/minicps>.
- [4] Hamid Reza Ghaeini, Daniele Antonioli, Ferdinand Brasser, Ahmad-Reza Sadeghi, and Nils Ole Tippenhauer. State-aware anomaly detection for industrial control systems. In *Proceedings of Symposium on Applied Computing(SAC)*, 2018.

- [5] Daniele Antonioli, Sandra Siby, and Nils Ole Tippenhauer. Practical evaluation of passive COTS eavesdropping in 802.11b/n/ac WLAN. In *Proceedings of Conference on Cryptology And Network Security (CANS)*, November 2017.
- [6] Daniele Antonioli, Nils Ole Tippenhauer, and Kasper Rasmussen. Nearby Threats: Reversing, Analyzing, and Attacking Google's "Nearby Connections" on Android. In *Network and Distributed System Security Symposium (NDSS)*, February 2019.
- [7] John Henry Castellanos, Daniele Antonioli, Nils Ole Tippenhauer, and Martín Ochoa. Legacy-compliant data authentication for industrial control system traffic. In *Proceedings of the Conference on Applied Cryptography and Network Security (ACNS)*, July 2017.
- [8] Vikram B Suresh, Daniele Antonioli, and Wayne P Burleson. On-chip lightweight implementation of reduced NIST randomness test suite. In *IEEE International Symposium on Hardware-Oriented Security and Trust (HOST)*, pages 93–98. IEEE, 2013. <http://sharps.org/wp-content/uploads/SURESH-HOST13.pdf>.
- [9] Daniele Antonioli. Design and testing of RNG. Master's thesis, University of Bologna and University of Massachusetts Amherst, Italy and US, 2013. <http://www.lulu.com/shop/daniele-antonioli/design-and-testing-of-rng/ebook/product-20965725.html>.
- [10] Daniele Antonioli. Artificial optical radiation management, risk and safety in the hospital environment. *Tecnica Ospedaliera (Italian Technical Magazine)*, 2010.