

CIAO!

I'M LUCA INVERNIZZI.

## // ABOUT ME

My passion is information security, and my expertise is malware. I am keen on building large-scale systems that discover hidden (malicious, usually) patterns in a sea of data. In my free time, I love to challenge myself by competing (or, sometimes, by running) hacking competitions.

I am a Ph.D. Candidate at the University of California, Santa Barbara. My main research focus is finding novel, robust ways to detect and prevent the spreading of malware. I am currently also researching in securing Android devices, and in maintaining (and breaking) one's privacy through traces left online.

In the past, I've been an active member of the GNOME open-source community, and I've had some fun in underwater robotics research.

## // EDUCATION

### 2010 - 2014 | Ph.D. Candidate in Information Security at U.C. Santa Barbara

During my Ph.D. studies, I have been having fun researching on:

- Malware on the web (with papers in the top infosec conferences: S&P, NDSS, CSS)
- How to better secure Android mobile devices (3 papers under submission, secured \$1.1M grant<sup>[1]</sup>)
- How to maintain some privacy online, and novel ways to invade it again :)
- How to teach information security with the help of hacking competitions

### 2010 - 2014 | Master's Student in Computer Science at U.C. Santa Barbara

GPA 4.0

### 2009 - 2010 | Visiting Researcher at the University of Hawaii

Besides snorkeling and hiking, at UH I've worked on a novel mathematical model to drive autonomous underwater vehicles. This work has been presented at the IEEE Conference on Decision and Control (CDC).

### 2007 - 2010 | "Diploma di Licenza" at the Sant'Anna School of Advanced Studies, Italy

*Summa cum laude*, full scholarship awarded as a winner of a nation-wide competition.

### 2007 - 2010 | Master's Degree in Control Engineering at the University of Pisa, Italy

*Summa cum laude*.

### 2008 | Visiting Researcher at U.C. Santa Barbara

In UCSB's mechanical engineering department, I've worked on a distributed algorithm to drive autonomous land vehicles to patrol an area. We have implemented this algorithm to make a group of (real) robotic vehicles collaborate with virtual ones. Part of this work is now part of the Player/Stage open-source framework.

### 2004-2007 | Bachelor's Degree in Computer Engineering at the University of Pisa, Italy

*Summa cum laude*, completed the *Path of Excellence* honors program.

## // PROFESSIONAL EXPERIENCE

### 2012 - 2014 | The Activity Exchange - Project Lead

At ActivityX, I've been in charge of designing and running a scalable service that collects, normalizes, and distributes sensitive health data (such as workouts and blood pressure readings) coming from 20+ sources (such as Fitbit and AppleHealth) and 200k+ users. This system is currently powering Achievemint.com<sup>[2]</sup>, and Humana Vitality<sup>[3]</sup>.

### 2013 | Narus - Research Intern

At Narus, I've designed Nazca, a system capable of discovering and tracking malicious downloads in the network traffic of ISPs. This work resulted in a NDSS'13 paper, a patent, and has sparked the interest of the press<sup>[4]</sup>.

## // CONTACT

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## // SKILLS

Pentesting & hacking

Agile web design (mostly backend)

Creating large-scale scalable systems

Data mining

Robotics

## // PUBLICATIONS

I have published papers in the fields of computer security and robotics.

- "Eyes of a Human, Eyes of a Program: Leveraging different views of the web for analysis and detection", J. Corbetta, L. Invernizzi, C. Kruegel, G. Vigna, in *Proceedings of the Research in Attacks, Intrusions and Defenses Symposium (RAID Symposium 2014)*
- "Ten Years of iCTF: The Good, The Bad, and The Ugly", G. Vigna, K. Borgolte, J. Corbetta, A. Doupe, Y. Fratantonio, L. Invernizzi, D. Kirat, Y. Shoshitaishvili, in *Proceedings of the USENIX Summit on Gaming, Games and Gamification in Security Education (3GSE 2014)*
- "Do You Feel Lucky? A Large-Scale Analysis of Risk-Rewards Trade-Offs in Cyber Security", Y. Shoshitaishvili, L. Invernizzi, A. Doupe, G. Vigna, in *Proceedings of the ACM Symposium on Applied Computing (SAC 2014)*
- "Nazca: Detecting Malware Distribution in Large-Scale Networks", L. Invernizzi, S. Miskovic, R. Torres, S. Saha, S. Lee, M. Mellia, C. Kruegel, G. Vigna, in *Proceedings of the ISOC Network and Distributed System Security Symposium (NDSS 2014)*
- "Message In A Bottle: Sailing Past Censorship", L. Invernizzi, C. Kruegel, G. Vigna, in *Proceedings of the Annual Computer Security Applications Conference (ACSAC 2013)*
- "You Are What You Include: Large-scale Evaluation of Remote JavaScript Inclusions", N. Nikiforakis, L. Invernizzi, A. Kapravelos, S. Van Acker, W. Joosen, C. Kruegel, F. Piessens, G. Vigna, in *Proceedings of the ACM Conference on Computer and Communications Security (CCS 2012)*
- "EVILSEED: A Guided Approach to Finding Malicious Web Pages", L. Invernizzi, S. Benvenuti, P. Milani Comparetti, M. Cova, C. Kruegel, G. Vigna, in *Proceedings of the IEEE Symposium on Security and Privacy (SSP 2012)* (AT&T NYU CSAW best security paper '12 finalist)

**2011 | Appfolio - Engineering Intern, Pentester**

At Appfolio, I've pentested the various RoR web apps developed there, including a payment-processing system handling the financial information of 100k+ users. I've fixed tens of vulnerabilities, ranging from logic flaws, XSSs, CSRFs, and authentication/authorization flaws. I left the company with a set of tools (integrated in their CI system) that perform static and dynamic analysis on the various products to alert the developers of possible security vulnerabilities before they go live.

**2010 | Google Summer of Code - Engineering Intern**

During my summer, I've extended Getting Things GNOME!<sup>[5]</sup>, a task manager for the Linux desktop, to support multiple synchronization services (such as Bugzilla, Evolution, RememberTheMilk,...). People liked the new GTG :)<sup>[6]</sup>

**2009 | Biorobotics Institute, Sant'Anna - Web Designer**

I've created and maintained the website for ANGELS <sup>[7]</sup>, an European project in underwater robotics.

**// OPEN SOURCE CONTRIBUTIONS****2010-2012 | The GNOME Foundation - Core Developer & Mentor**

I like participating in the open-source world, whenever I have time. In this period, I've been a core developer of "Getting Things GNOME"<sup>[5]</sup>, and I've become a member of the GNOME Foundation<sup>[8]</sup>. I've also mentored five nice international students for several editions of the Google Summer of Code<sup>[9]</sup> and the <sup>[10]</sup> Gnome's Outreach Program for Women.

**2009-now | Open Source :)**

Over time, like any well-behaved developer I've shared online a few niche projects that other people are using (such as Scapy's support for HTTP<sup>[11]</sup>, which a few companies, such as Lastline and Google, are currently using in some of their projects, and Chrisper<sup>[12]</sup>, a style-checker for academic papers). I've also made many contributions, big and small, to popular open-source projects (PLAYER robotic framework, Flask-Security, Eucalyptus...). Check out my Github<sup>[13]</sup> page for a collection of a few of those.

**// COMPETITIONS****2010-now | Hacking Competitions - Hacker**

I've played in tens of hacking competitions, including the DEFCON CTF in Las Vegas, with my team Shellphish<sup>[14]</sup>. With the team, I've also designed and organized for four years the iCTF<sup>[15]</sup>, the biggest academic hacking competition, with more than 1k players from all over the globe.

**2008 | European Space Agency Robotic Challenge - Robot Hacker**

In this competition, ESA challenged university students to design and build a robotic vehicle capable of retrieving samples in a steep lunar crater. With my team from the SSSUP university, we build an hexapod<sup>[16]</sup> that managed to be selected up to the final in Tenerife. Unfortunately, while our robot was in the crater it started raining (in a very lunar fashion), which shorted our robot's circuits :)

- "Geometric control for autonomous underwater vehicles: overcoming a thruster failure", M. Andonian, D. Cazzaro, L. Invernizzi, M. Chyba, S. Grammatico, in *Proceedings of the IEEE Conference on Decision and Control (CDC 2010)*
- "Trajectory Design for Autonomous Underwater Vehicles for Basin Exploration", M. Chyba, D. Cazzaro, L. Invernizzi, M. Andonian, in *Proceedings of the International Conference on Computer and IT Applications in the Maritime Industries (COMPIT 2010)*
- "A Geometric Approach to Trajectory Design for an Autonomous Underwater Vehicle: Surveying the Bulbous Bow of a Ship", R. N Smith, D. Cazzaro, L. Invernizzi, G. Marani, S. K Choi, M. Chyba, in *Acta applicandae mathematicae, 2010*

**// PATENTS**

- (Pending approval) Detecting Malware Infestations in Large-Scale Networks, L. Invernizzi, S. Miskovic, R. Torres, S. Saha, S. Lee, M. Mellia, C. Kruegel, G. Vigna

**// IN THE PRESS**

In the past years I have been lucky enough that people have taken interest in my work and wrote articles about it. Here's a collection of the ones I am most proud of:

- New detection system spots zero-day malware<sup>[19]</sup>
- Zoom out for a view of malware, say boffins<sup>[4]</sup>
- Enterprising research IDs zero day malware<sup>[20]</sup>
- UCSB Security Researchers To Help Too-Trusting Smartphone App Users<sup>[1]</sup>
- World's Largest Computer Hacking Contest Happening at UCSB<sup>[21]</sup>
- Cyberteams duke it out in the World Series of hacking<sup>[22]</sup>
- Getting things done with Linux to-do list programs<sup>[23]</sup>
- Germany's CESAR crowned king of rovers in ESA's Robotics Challenge<sup>[24]</sup>

## // LINKS

To avoid having to type in these links, You can visit [www.lucaavernizzi.net](http://www.lucaavernizzi.net) for an online version of this CV.

- [0] [http://www.lucaavernizzi.net/files/luca\\_invernizzi\\_resume.pdf](http://www.lucaavernizzi.net/files/luca_invernizzi_resume.pdf)
- [1] <http://campustechnology.com/articles/2014/09/18/ucsb-security-researchers-to-help-too-trusting-smartphone-app-users.aspx?admgarea=news>
- [2] <http://www.achievemint.com/>
- [3] <https://www.humana.com/vitality/>
- [4] [http://www.theregister.co.uk/2014/02/18/zoom\\_out\\_for\\_a\\_view\\_of\\_malware\\_say\\_boffins/](http://www.theregister.co.uk/2014/02/18/zoom_out_for_a_view_of_malware_say_boffins/)
- [5] <http://gtgnome.net/>
- [6] <http://www.omgubuntu.co.uk/2009/12/getting-things-gnome-gets-rtm-sync-geolocation-ui-tweaks-much-love-from-me>
- [7] <http://sssa.bioroboticsinstitute.it/projects/ANGELS>
- [8] <http://www.gnome.org/>
- [9] <https://developers.google.com/open-source/soc/?csw=1>
- [10] <https://wiki.gnome.org/OutreachProgramForWomen>
- [11] <https://github.com/invernizzi/scapy-http>
- [12] <https://github.com/invernizzi/Chrisper>
- [13] <https://github.com/invernizzi/>
- [14] <https://ctftime.org/team/285>
- [15] <http://itf.cs.ucsb.edu/>
- [16] [http://4.bp.blogspot.com/\\_PZedSw-39RQ/SSqXB53sdSI/AAAAAAAAAAc/WuE0ksclj\\_4/s1600/pESApod\\_moon.jpg](http://4.bp.blogspot.com/_PZedSw-39RQ/SSqXB53sdSI/AAAAAAAAAAc/WuE0ksclj_4/s1600/pESApod_moon.jpg)
- [17] <http://blog.lucaavernizzi.net/>
- [18] <http://scholar.google.com/citations?user=4CEVnEMAAAJ&hl=en>
- [19] [http://www.net-security.org/malware\\_news.php?id=2712](http://www.net-security.org/malware_news.php?id=2712)
- [20] <http://www.crn.com.au/News/372515,enterprising-research-ids-zero-day-malware.aspx>
- [21] <http://www.keyt.com/news/worlds-largest-computer-hacking-contest-happening-at-ucsb/23363462>
- [22] <http://www.cnn.com/id/101179977>
- [23] <http://arstechnica.com/information-technology/2009/07/getting-things-done-with-linux-todo-list-programs/>
- [24] [http://www.esa.int/Education/Germany\\_s\\_CESAR\\_crowned\\_king\\_of\\_rovers\\_in\\_ESA\\_s\\_Robotics\\_Challenge2](http://www.esa.int/Education/Germany_s_CESAR_crowned_king_of_rovers_in_ESA_s_Robotics_Challenge2)
- [25] <https://www.cs.ucsb.edu/~vigna/>
- [26] <https://www.cs.ucsb.edu/~chris/>
- [27] <http://alessiosignorini.com/>
- [28] <http://lucafoschini.com/>
- [29] <http://www.linkedin.com/in/jwalker>