# Giulio **De Pasquale**

## COMPUTER SECURITY ENGINEER

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## Education

**Ph.D Candidate in Computer Security**   *London, United Kingdom*
KING'S COLLEGE LONDON, DEPARTMENT OF INFORMATICS   *November 2018 - PRESENT*

Post-graduate research programme covering a wide spectrum of Computer Security topics, focusing mainly on **program analysis**. Other research interests include binary obfuscation/deobfuscation methodologies, malware analysis and vulnerability identification and exploitation.
Advised by Professor Lorenzo Cavallaro.

**B.Sc Degree in Engineering of Computing Systems**   *Milan, Italy*
POLITECNICO DI MILANO   *September 2011 - September 2017*

Degree that covers all the fundamental topics in the IT area, such as Algorithms, Operating Systems, Databases and Computer Architectures, combined to major Engineering subjects including Physics, Math and Algebra.

## Experience

**Research Intern**   *Remote*
TWEAG I/O   *June 2021 - PRESENT*

Worked on the type system of the **Nickel** configuration language.
Advised by Yann Hamdaoui.
  *https://github.com/tweag/nickel*

**Research Intern - NExT Special Projects**   *Redmond, Washington, USA*
MICROSOFT RESEARCH   *June 2019 - September 2019*

Researched **malware analysis** techniques on **ELF core** files as part of *Microsoft Project Freta*. The project has been developed in **Rust**.
Advised by Mike Walker.
  *https://aka.ms/freta*

**Visiting Graduate Researcher - SecLab**   *Santa Barbara, California, USA*
UNIVERSITY OF CALIFORNIA, SANTA BARBARA   *January 2018 - July 2018*

Researched **binary deobfuscation** techniques and novel **fuzzing** methodologies targeting IOT devices.
Advised by Professors Christopher Kruegel and Giovanni Vigna.

## Publications

**DIANE: Identifying Fuzzing Triggers in Apps to Generate Under-constrained Inputs for IoT Devices**   *Online*

42ND IEEE SYMPOSIUM ON SECURITY AND PRIVACY **(S&P)**   *May 2021*

DIANE is a tool that combines static and dynamic analysis to find fuzzing triggers and uses them to fuzz IoT devices automatically.

- **Authors:**
  Nilo Redini, Andrea Continella, Dipanjan Das, **Giulio De Pasquale**, Noah Spahn, Aravind Machiry, Antonio Bianchi, Christopher Kruegel, Giovanni Vigna.

### ShieldFS: A Self-healing, Ransomware-aware Filesystem

*Los Angeles, California, USA*

IN PROCEEDINGS OF THE ANNUAL COMPUTER SECURITY APPLICATIONS CONFERENCE **(ACSAC)**

*December 2016*

ShieldFS is an innovative solution to fight **ransomware** attacks. It automatically creates detection models that distinguish ransomware from benign processes at runtime on the base of the filesystem activity. ShieldFS adapts these models to the filesystem usage habits observed on the protected system.

- **Authors:**

  Andrea Continella, Alessandro Guagnelli, Giovanni Zingaro, **Giulio De Pasquale**, Alessandro Barenghi, Stefano Zanero, Federico Maggi.
  - 🌐 *http://shieldfs.necst.it*

# Personal projects

### Rustico

*London, UK*

PERSONAL INTEREST

*November 2020 - PRESENT*

Rustico is a **Rust** cryptocurrency trading bot. It is features a frontend developed with **Svelte and TailwindCSS** and it is extendable with user-programmed trading strategies.

### Pasticciotto

*Milan, Italy*

POLICTF '17

*June 2017*

Pasticciotto is a polimorphic **Virtual Machine** which can be embedded in an application to protect proprietary code. It was developed for the **PoliCTF '17** as a reverse engineering challenge. The project is open source and it is written in **C++**.

- 🌐 *https://github.com/peperunas/pasticciotto*

### Injectopi

*Milan, Italy*

POLITECNICO DI MILANO

*February 2017 - May 2017*

Injectopi is a set of tutorials that illustrates multiple **code injection** techniques in the Microsoft Windows environment. The project is open source and it is written in **C**.

- 🌐 *https://github.com/peperunas/injectopi*

### AESTracer

*Milan, Italy*

POLITECNICO DI MILANO

*October 2015 - January 2016*

AESTracer is a **Microsoft Windows driver** which actively scans running processes for valid AES keyschedules. It has been included in a research project, ShieldFS, which was later published at ACSAC '16. The project was written in **C**.

# Technical skills

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|---:|:---|
| **Operating Systems** | Gentoo, Arch Linux, Debian, Ubuntu, Microsoft Windows, MacOS |
| **Programming** | Python, Rust, C, TypeScript, Bash, C++, Java, WINAPI |
| **System Administration** | Docker, iptables, Wireguard, OpenVPN, Restic, Ansible, Systemd, Traefik |

# Research Labs

### S2Lab

*London, United Kingdom*

KCL'S SYSTEMS SECURITY RESEARCH LAB

*November 2018 - PRESENT*

The Systems Security Research Lab (S2Lab) is part of the Cybersecurity group in the Department of Informatics at King's College London.

- 🌐 *https://s2lab.kcl.ac.uk/*

### SecLab

*Santa Barbara, California, USA*

UCSB'S COMPUTER SECURITY RESEARCH LAB

*January 2018 - July 2018*

The Computer Security Group at UCSB works on tools and techniques for designing, building, and validating secure software systems.

- 🌐 *https://seclab.cs.ucsb.edu/*

### NECSTLab
Politecnico di Milano's Novel Emerging Computing System Technologies Laboratory

*Milan, Italy*
*March 2014 - September 2017*

> The NECSTLab is a research laboratory of Politecnico di Milano focusing on a number of different research lines on advanced topics in computing systems.
> 🌐 *https://necst.it*

### POuL Linux User Group
Politecnico Open unix Labs

*Milan, Italy*
*March 2014 - PRESENT*

> I am an *honorary member* of POuL, a hackerspace and association of Politecnico di Milano students interested in Linux, hacking and FOSS.
> 🌐 *https://poul.org*

## CTF Teams

### mHACKeroni
Italian Capture the Flag (CTF) Team

*Italy*
*May 2019 - PRESENT*

> mHACKeroni is a CTF team composed of 5 CTF Italian teams. We qualified to **DEFCON 2019 Finals** and placed 5th out of 16 finalists.
> • Involved in the organization of the **mHACKeCTF '20** competition.
> 🌐 *https://mhackeroni.it*

### Phish 'n' Chips
King's College London Capture the Flag (CTF) Team

*London, United Kingdom*
*November 2018 - PRESENT*

> Founder of King's College London CTF team.

### Shellphish
UCSB's Capture the Flag (CTF) Team

*Santa Barbara, California, USA*
*January 2018 - July 2018*

> Involved in the organization of the **UCSB's iCTF 2018** competition.
> 🌐 *https://ictf.cs.ucsb.edu/*

### Tower of Hanoi
Politecnico di Milano's Capture the Flag (CTF) Team

*Milan, Italy*
*September 2014 - PRESENT*

> Involved in the organization of the **PoliCTF 2015** competition held during DIMVA 2015 in Milan.
> 🌐 *https://polictf.it*

## Volunteering

### Residence Welfare Lead
King's Residences

*London, United Kingdom*
*January 2021 - PRESENT*

Residence Welfare Leads are recruited to help residents in King's residences. Welfare Leads are specially trained to live in the Halls and provide an out-of-hours wellbeing support service to our residents, including first aid, mental health and crisis prevention.