

Giulio De Pasquale

COMPUTER SECURITY PHD CANDIDATE

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Experience

 **Visiting PhD Student - SecLab**
UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Santa Barbara, California, USA

June 2022 - October 2023

Conducted research on the application of **AI planning** in post-exploitation scenarios. This involved automatically deriving system facts and creating action chains for privilege escalation. This work was a component of the DARPA HARDEN program.

🌐 <https://seclab.cs.ucsb.edu> | 🧑🏫 Advised by Prof. Christopher Kruegel and Prof. Giovanni Vigna

 **Visiting PhD Student**
UNIVERSITY COLLEGE OF LONDON

London, United Kingdom

June 2021 - PRESENT

Joined UCL's ISec research group to collaborate on ongoing research projects. Coordinated an ongoing series of fortnightly **hands-on seminars** on information security while focusing on solving CTF challenges.

🌐 <https://sec.cs.ucl.ac.uk>

 **Research Intern**
TWEAG I/O

Remote

June 2021 - PRESENT

Worked on the improving the robustness of the type system of **Nickel**, a declarative configuration language. The project is written in **Rust**.

🌐 <https://github.com/tweag/nickel> | 🧑🏫 Advised by Dr. Yan Hamdaoui

 **Research Intern - NEXt Special Projects**
MICROSOFT RESEARCH

Redmond, Washington, USA

June 2019 - September 2019

Researched **malware analysis** techniques to detect active threats in **ELF core** files as part of *Microsoft Project Freta*. The project has been developed in **Rust**.

🌐 <https://aka.ms/freta> | 🧑🏫 Advised by Mike Walker

 **Visiting Graduate Researcher - SecLab**
UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Santa Barbara, California, USA

January 2018 - July 2018

Researched **deobfuscation** techniques for software protected by VM obfuscation and **fuzzing** methodologies targeting IoT devices.

🌐 <https://seclab.cs.ucsb.edu> | 🧑🏫 Advised by Prof. Christopher Kruegel and Prof. Giovanni Vigna

Publications

ROPfuscator: Robust Obfuscation with ROP

San Francisco, California, USA

2023 IEEE SECURITY AND PRIVACY WORKSHOPS (SPW)

May 2023

Based on Return-Oriented Programming (ROP), ROPfuscator is a compiler-driven software **obfuscation pass**, developed to protect intellectual property in software from sophisticated man-at-the-end (MATE) attacks and reverse engineering attempts.

• **Authors:**

Giulio De Pasquale, Fukutomo Nakanishi, Daniele Ferla, Lorenzo Cavallaro.

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

32ND ANNUAL COMPUTER SECURITY APPLICATIONS CONFERENCE (ACSAC) & BLACK HAT '17

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 Barengi, Stefano Zanero, Federico Maggi.

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.

<https://s2lab.kcl.ac.uk> | Advised by Prof. 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 with major Engineering subjects including Physics, Math and Algebra.

Technical skills

Operating Systems Programming

Gentoo, NixOS, Arch Linux, Debian, Ubuntu, Microsoft Windows, MacOS
Python, Rust, Nix, C, Souffle, PDDL, TypeScript, Bash, C++, Java

Interests

Reverse engineering, program analysis, system administration,
declarative, low-level and systems' programming

Conferences contributions

Reviewer USENIX 2019, WOOT 2023, ESORICS 2023

Artifact Evaluation Committee USENIX 2021/2022/2023, NDSS 2023, WOOT 2023

Personal projects

Rustico

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

Pasticciotto

<https://github.com/peperunas/pasticciotto>

Pasticciotto is a polymorphic **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++**.

Injectopi

<https://github.com/peperunas/injectopi>

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**.

AESTracer

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**.

CTF Teams



mHACKeroni

ITALIAN CAPTURE THE FLAG (CTF) TEAM

Italy

May 2019 - PRESENT

mHACKeroni is composed by five CTF Italian teams. We qualified and placed 5th to **DEFCON 2019 Finals**.

- 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 the team.

<https://phishnchips.co.uk>



Shellphish

UCSB'S CAPTURE THE FLAG (CTF) TEAM

Santa Barbara, California, USA

January 2018 - PRESENT

- 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 - June 2022

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.



Dog Volunteer

SANTA BARBARA HUMANE

Santa Barbara, California, USA

March 2023 - October 2023

As a Dog Volunteer, daily care was provided for shelter dogs, including exercise, basic training, and socialization. The role involved maintaining the cleanliness of the housing environment, reporting any concerns, and assisting in the adoption process. Operational tasks such as feeding and spot cleaning were also performed. The volunteers are trained in safe animal handling, positive reinforcement training, and reporting changes in animal behavior or health.