Edoardo Di Paolo

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CONTACTS AND PERSONAL INFORMATION

Edoardo Di Paolo
January 18, 1998. Mantova, Italy.
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EXPERIENCES

Visiting Scholar, Indiana University in Bloomington January 2025 - June 2025
Doing research on social bots at the Luddy Center for Artificial Intelligence under the supervision of professors Filippo Menczer and Alessandro Flammini.

Teaching Assistant at "La Sapienza", University of Rome October 2023 - February 2024
Teaching assistant for the course "Programming" (python).

Artisan Summer School, Austrian Institute Technology (AIT) July 2023
Topics: Artificial Intelligence and Machine Learning with regards to security and safety applications.

Research Scholar at "La Sapienza", University of Rome May 2022 - October 2022
Analysis and testing of new attacks on the IPv6 protocol.

EDUCATION

"La Sapienza", University of Rome & **Luiss Guido Carli** November 2022 - 2025
Ph.D. in Cybersecurity in collaboration with Luiss Guido Carli.

"La Sapienza", University of Rome December 2020 - October 2022
Master of Science in Computer Science, 110/110 cum Laude
Thesis: "Bot Detection Leveraging Image Techniques"

"La Sapienza", University of Rome September 2017 - December 2020
Bachelor's degree in Computer Science, 101 / 110
Thesis: "Analysis of security issues of MQTT protocol"

Liceo classico "Pilo Albertelli" September 2011 - July 2016
Classical studies

TECHNICAL SKILLS

Programming Languages: *Python, PHP, SQL, C, C++, C#, XML, JSON, Java, Javascript, Lua, TypeScript*
Frameworks and libraries: *Laravel, Django, ns3, Angular, Codeigniter, Spark, PyTorch, Pandas, socket.io, React, PyTorch Lightning*
Softwares and others: *AWS, Git, Docker, VirtualBox, Office, Apache, IIS, nginx, Cloudflare, Telegram APIs, Twitch APIs, LaTeX, MongoDB, Node.js, MySQL, PostgreSQL, GraphQL*

PUBLICATIONS

Enrico Bassetti, Edoardo Di Paolo, Francesco Drago, Mauro Conti, Angelo Spognardi. "Opening Pandora's Packet: Expose IPv6 Implementations Vulnerabilities Using Differential Fuzzing", *International Conference on Applied Cryptography and Network Security - 2025, 23-26 June, Munich.*

Edoardo Allegrini, Edoardo Di Paolo, Marinella Petrocchi, Angelo Spognardi. "Deciphering Social Behaviour: a Novel Biological Approach For Social Users Classification", *ACM/SIGAPP Symposium On Applied Computing - 2025, 31 March - 4 April, Catania.*

Edoardo Allegrini, Edoardo Di Paolo, Marinella Petrocchi, Angelo Spognardi. "Deciphering Social Identity: a Novel Genetic Approach For Social Users Classification", *International Conference on Discovery Science - 2024, 14-16 October, Pisa.*

Edoardo Di Paolo, Enrico Bassetti, Angelo Spognardi. "A New Model for Testing IPv6 Fragment Handling", *ESORICS 2023, 25-29 September, The Hague.*

Edoardo Di Paolo, Angelo Spognardi, Marinella Petrocchi. "From Online Behaviours to Images: A Novel Approach to Social Bot Detection", *International Conference on Computational Science (ICCS) - 2023, 3-5 July, Prague.*

Edoardo Di Paolo, Enrico Bassetti, Angelo Spognardi. "Security assesment of common open source MQTT brokers and clients", *Italian Conference on CyberSecurity (ITASEC) - 2021, Online.*

SECURITY ADVISORIES

CVE-2024-6640: ICMPv6 packets with identifier value of zero bypass firewall rules written on the

assumption that the incoming packets are going to create a state in the state table.
CVE-2023-4809: IPv6 fragments may bypass firewall rules written on the assumption all fragments have been reassembled and, as a result, be forwarded or processed by the host. [1]

Projects and others

F1 22 Telemetry December 2022
A simple UDP server which parses UDP packets from the F1 22 game. This project uses python as backend and NextJS as frontend. **Source code**

F1 cars tracking November 2021 - February 2022
A *Computer Vision* project to track the F1 cars in videos producing the correct bounding box with a *transfer learning* approach with an RCNN model. **Source code**

Drones Routing Algorithms November 2021 - January 2022
These homeworks are about routing protocols for drones with a *reinforcement learning* approach. The first homework was about the *k-bandit* problem and the last two were about the *Q-learning* and the energy consumption trying to minimize the latency. **Source code**

Fundamentals of Computer Graphics Homeworks October 2021 - December 2021
In these homeworks I implemented different renders in C++ with the **yocto-gl** library; for example one of the implemented render was about the hair rendering. **Source code**

Flood-WUP Implementation July 2021 - December 2021
It is the implementation with ns3 of Flood-WUP (described in **this paper**) for the AFC (subsidiary formative activity). It is a flooding protocol for devices with low energy. **Source code**

Asteroids Predictions April 2021 - June 2021
The project consists of two tasks: a *binary classification* to decide if an asteroid is potentially hazardous or not and a *regression problem* that tries to predict the asteroids' diameter. **Source code**

MQTT Fuzzer September 2020 - December 2020
An MQTT fuzzer in order to test MQTT brokers and clients. It is written in *python* and it uses a library called *twisted*. **Source code**

Foundations of Data Science homeworks September 2020 - December 2020
Image filtering and object identification, histogram distances, logistic regression, gradient ascent, Newton's method, Gaussian Discriminant Analysis **Source code**

OpenJML December 2020 - January 2021
A project for the *Security in Software Applications* course in which I used JML for a Java code in order to correct errors in the source. **Source code**

Image classification November 2020 - December 2020
A ML project where I used some *neural network* in order to classify images in 8 different classes with different models. **Source code**

Assembly functions classification October 2020 - November 2020
A ML project in order to classify correctly some type of assembly functions. **Source code**

Static analysis with FlawFinder and Splint October 2020 - November 2020
A project for the *Security in Software Applications* course in which I used FlawFinder and Splint in order to find vulnerabilities. **Source code**

Sapienza Classroom April 2020 - June 2020
The project is a website similar to *Google Classroom* built with *ReactJS, PHP, PostgreSQL* and *socket.io* as websocket. **Source code**

Languages

Italian: *native proficiency*
English: *professional working proficiency*

[1] This section may not be updated. Other projects are available in my GitHub profile.