PhD in Information Technology and Electrical Engineering
Università degli Studi di Napoli Federico II

PhD Student: Francesco Caputo

Cycle: 37

Training and Research Activities Report

Year: First

student signature

Tutor: prof. Pasquale Arpaia   *tutor signature*

Co-Tutor:

Date: December 12, 2022

Training and Research Activities Report
PhD in Information Technology and Electrical Engineering

Cycle: **Author:**

1. Information:

> - **PhD student: Francesco Caputo**
> - **DR number: DR996113**
> - **Date of birth: 26/12/1992**
> - **Master Science degree: Electronic Engineering**   **University: University of Napoli "Federico II"**
> - **Doctoral Cycle: 37**
> - **Scholarship type: *MUR PON***
> - **Tutor: Pasquale Arpaia**
> - **Co-tutor:**

2. Study and training activities:

Activity	Type[1]	Hours	Credits	Dates	Organizer	Certificate[2]
Statistical data analysis for science and engineering research	**Course**	**12**	**4**	**22-24-29-31/03/2022 05-07/04/2022**	**Roberto Pietrantuono**	**Y**
Laboratorio di programmazione (MSc)	**Course**		**9**	**15/03/2022 To 27/06/2022**	**Luigi De Simone**	**Y**
Machine Learning for Science and Engineering Research	**Course**		**5**	**20/06/2022 to 30/09/2022**	**A.Corazza, R.Prevete, F.Isgrò, C.Sansone**	**Y**
Metrology and machine learning for brain computer interfaces	**Course**		**3**	**13/09/2022 to 10/10/2022**	**Pasquale Arpaia**	**Y**
Sustainable ship for the energy	**Course**		**4**	**27/10/2022 To 27/10/2022**	**Tommaso Coppola**	**Y**
An Introduction to Deep Learning for Natural Language Processing	**Seminar**	**1**	**0,2**	**13/04/2022**	**Francesco Cotugno**	**Y**
Using Delays For Control (Part 1)	**Seminar**	**1**	**0,2**	**21/04/2022**	**Stefania Santini**	**Y**
On using simple optimization tecniques for tuning of UAVs	**Seminar**	**2**	**0,4**	**27/04/2022**	**Fabio Ruggiero**	**Y**
Probing and infusing biomedical knowledge for pre-trained	**Seminar**	**2**	**0,4**	**07/06/2022**	**Francesco Cotugno**	**Y**

language models						
Variable IO Latencies in real life	**Seminar**	**2**	**0,4**	**09/06/2022**	**Marcello Cinque**	**Y**
Come scrivere un CV	**Seminar**	**2**	**0,4**	**08/06/22**	**Pasquale Arpaia**	**Y**
IEEE Xplore Webinar: Search Strategies to Maximize Your Research Experience	**Seminar**	**1**	**0,2**	**12/10/2022**	**IEEE**	**Y**
IEEE Authorship and Open Access Symposium: Tips and best practies to get published from IEEE Editors	**Seminar**	**1,5**	**0,3**	**25/10/2022**	**IEEE**	**Y**
Connecting the dots: Investigating an APT campaign using Splunk	**Seminar**	**2**	**0,4**	**11/11/2022**	**S.P.Romano, R.Natella**	**N**
Cybercrime and Information Warfare: National and International Actors	**Seminar**	**2**	**0,4**	**18/11/2022**	**Simon Pietro Romano**	**Y**
Data mining the output of quantum simulators from critical behavior to algorithmic complexity	**Seminar**	**2**	**0,4**	**11/12/2022**	**S.P.Romano, R.Natella**	**N**
Digitalizzazione dei processi di selezione	**Seminar**	**2**	**0,4**	**30/11/2022**	**Pasquale Arpaia**	**Y**
Accelerate Battery Development with Unified Design, Modeling and Simulation	**Seminar**	**1**	**0,2**	**07/12/2022**	**IEEE**	**Y**
AI Standards: Ethical Considerations And Best Practices When Implementing AI in your organization	**Seminar**	**1**	**0,2**	**09/12/2022**	**IEEE**	**Y**
Seminar: Game theory for information engineering	**Seminar**	**3**	**0,6**	**13/12/2022**	**Marcello Caleffi**	**Y**

1) Courses, Seminar, Doctoral School, Research, Tutorship
2) Choose: Y or N

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2.1. Study and training activities - credits earned

	Courses	Seminars	Research	Tutorship	Total
Bimonth 1	0	0	9	0	9
Bimonth 2	0	0,8	5	0	5,8
Bimonth 3	13	1,2	5	0	19,2
Bimonth 4	0	0	6	0	6
Bimonth 5	12	0,5	5	0	17,5
Bimonth 6	0	2,6	0	0	5,6
Total	25	5,1	30	0	60,1
Expected	20 - 40	5 - 10	10 - 35	0 – 1.6	

3. Research activity:

My research activity focused on cybersecurity for IoT devices involved in agri-food application field. In this period, I conducted an in-depth study on the state of the art concerning "side-channel attacks" using "machine learning" models, i.e. attacks on embedded devices based on power traces, and consequently I worked on the drafting of a scientific article which is responsible for investigating the performance of such attack. I also spent the period in the STMicroelectronics company, conducting low-level functional and vulnerability tests of embedded "secure elements", i.e., microcontrollers for secure data management. I also worked on a test tool for embedded secure elements and written a scientific article for conference.

4. Research products:

Pasquale Arpaia, Francesco Caputo, Antonella Cioffi, Antonio Esposito, Francesco Isgrò, Uncertainty analysis in cryptographic key recovery for machine learning-based power measurements attacks, IEEE Transactions for Instrumentation and Measurements, 2024 (NOT yet indexed)

5. Conferences and seminars attended

None

6. Activity abroad:

None

7. Tutorship

None