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

PhD Student: Volpe Francesco

Cycle: XXXVII

Training and Research Activities Report

Year: FIRST

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Tutor: prof. Mario Pagano   _____

Date: December 13, 2022

Training and Research Activities Report

PhD in Information Technology and Electrical Engineering

Cycle: **Author:**

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1. Information:

- ➢ **PhD student: Volpe Francesco**
- ➢ **DR number: DR996116**
- ➢ **Date of birth: 24/09/1993**
- ➢ **Master Science degree: Electrical Engineering**   **University of Naples "Federico II"**
- ➢ **Doctoral Cycle: XXXVII**
- ➢ **Scholarship type:** *MUR PON*
- ➢ **Tutor: Prof. Mario Pagano**

2. Study and training activities:

Activity	Type[1]	Hours	Credits	Dates	Organizer	Certificate[2]
School F. Gasparini	Doctoral School		4	January, 2022	Gasparini School	Y
Modellistica dei mercati elettrici	Course	48	6	Sep-Dec 2022		Y* (*at 20 december)
Tecnica e diagnostica di isolamenti in alta tensione	Course	48	6	Mar-Jun 2022		Y
Identificazione e controllo ottimo	Course	48	6	Mar-Jun 2022		N
Statistical Data Analysis for Science and Engineering Research	Course	10	4	Mar-Apr 2022		N
Operational Research: Mathematical Modelling, Methods and Software	Course	10	4	Sep-Oct 2022		Y
The spatial structure of Bi-photon States	Seminar	1	0.2	12 January, 2022	Dr. Alessio D'Errico	N
Il dynamic thermal rating delle linee elettriche aeree di trasmissione	Seminar	4	0.4	21 October, 2022	AEIT	N
I mercati dell'energia elettrica	Seminar	2	0.2	30 November, 2022	Unina	N
Cybercrime and Information Warfare:	Seminar	2	0.4	18 Novembe	Prof. S.P. Romano, R	N

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National and International Actors				**r, 2022**	**Natella**	
Stabilizer Renyi Entropy and Quantum Complexity	**Seminar**	**1**	**0.2**	**02 November, 2022**	**Prof Alioscia Hamma**	**N**

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

2.1. Study and training activities - credits earned

	Courses	**Seminars**	**Research**	**Tutorship**	**Total**
Bimonth 1	**4**	**0.2**	**5**	**0**	**9.2**
Bimonth 2	**0**	**0**	**6**	**0**	**6**
Bimonth 3	**0**	**0**	**4**	**0**	**4**
Bimonth 4	**0**	**0**	**4**	**0**	**4**
Bimonth 5	**4**	**0.4**	**7**	**0**	**11.4**
Bimonth 6	**12***	**0.8**	**3**	**0**	**15.8**
Total	**20**	**1.4**	**29**	**0**	**50.4**
Expected	**30 - 70**	**10 - 30**	**80 - 140**	**0 – 4.8**	

*12 at the 20 of December

3. Research activity:

The main topic of the research is about the Health Index (HI) methodology which is a number between 0 and 1 that indicates the physical condition of the item.Silicon rubber coated room temperature vulcanized (RTV) insulators and overhead power lines are investigated in order to asses an HI. Furthermore, thought an optimization problem based on the reliability of the component, it could be obtained the optimal economy time of replacement. To asses the HI of the insulators some laboratory test can be carried out as AC leakage current, Power Factor (PF) measurement and Breakdown Voltage measurement. Meanwhile, for overhead power lines a mechanical ageing mathematical model was developed. Other topic during this year was optimization problem in railway system.

4. Research products:

A. Di Pasquale, M. Pagano, C. Petrarca, F. Volpe,
"Assessing a Health Index Algorithm for High Voltage Overhead Power Lines"
AEIT International Annual Conference 2022, published, 2022

A. Andreotti, A. Di Pasquale, M. Pagano, N. Ravichandran, F. Volpe,
"Analysis of Lightning Transients in 2x25 kV 50 Hz Railway Traction System using EMPT"
AEIT Internation Annual Conference 2022, published, 2002

A. Andreotti, A. Di Pasquale, M. Pagano, N. Ravichandran, F. Volpe
"An Optimal Centralized Control Strategy for Regenerative Braking Energy Flow Exchanges in DC Railway Traction System"
2022 Internation Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM, published, 2022

M. Balato, A. Di Pasquale, M. Pagano, C. Petrarca, F. Volpe,
Evaluation of Electrical Characteristics of Aged RTV-Coated Insulators Removed from Service
<u>*Ready to be submitted*</u>

5. Conferences and seminars attended

AEIT International Annual Conference 2022, Rome 03-05 October, 2022. I have presented the paper Assessing a Health Index Algorithm for High Voltage Overhead Power Lines.

20th International Conference on Harmonics and Quality Power, ICHQP 2022, Naples 29 May- 1 June,2022

6. Activity abroad:

7. Tutorship