



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

PhD Student: Salvatore Tessitore

Cycle: XXXV

Training and Research Activities Report

Year: First

Salvatore Tessitore

Tutor: prof. Angrisani Leopoldo

Co-Tutor: Liccardo Annalisa

Date: October 21, 2020

Training and Research Activities Report

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Author: Salvatore Tessitore

1. Information:

- **PhD student:** Salvatore Tessitore
- **DR number:** DR993883
- **Date of birth:** 26/11/1992
- **Master Science degree:** Electrical Engineering **University:** Federico II “Napoli”
- **Doctoral Cycle:** XXXV
- **Scholarship type:** *no scholarship*
- **Tutor:** Angrisani Leopoldo
- **Co-tutor:** Liccardo Annalisa; Giannuzzi Giorgio Maria (Terna Rete Italia)

2. Study and training activities:

Activity	Type ¹	Hours	Credits	Dates	Organizer	Certificate ²
MSc course, Sensori e trasduttori di misura,	Course		9	21/02/2020.	Prof. Schiano Lo Moriello Rosario,	Y
Computational Biology: Large scale data analysis to understand the molecular based of human diseases.	Seminar	1	0.2	09/04/2020	Prof. Michele Ceccarelli	Y
How to get published with the ITEE?	Seminar	2	0.4	20/04/2020	Dr.ssa Eszter Lukacs	Y
Innovation management, entrepreneurship and intellectual property,	Course		5	07/05-19/06	Prof. Pierluigi Rippa	Y
Introduction to convolutional neural networks: analysis and algorithms,	Seminar	3,5	0.7	05/05/2020	Dr Davide Ruggiero (R&D ST Microelectronics)	Y
Large Scale Training of Deep Neural Networks	Seminar	2	0.4	06/05/2020	Giuseppe Fiameni, PhD.	N
Design e Nuove tecnologie.Possibili scenari per	Seminar	1	0.2	11/05/2020	Amleto Picerno Ceraso	Y

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fronteggiare l'emergenza,					Innovation Village	
La programmazione europea e la ricerca. La gestione di un progetto di ricerca,	Seminar	2	0.4	13/05/2020	Ing. Filippo Ammirati Innovation Village	Y
Health 4.0 – La rapidità della medicina e la velocità del cambiamento del nostro mondo	Seminar	2	0.4	14/05/2020	Paolo Netti Innovation Village.	Y
Realtà Virtuale e salute reale.Health 4.0 – Dal bit alla mente: spazi virtuali per la salute,	Seminar	2,5	0.5	15/05/2020	Valentino Megale Innovation Village	Y
Planning 5G under EMF constraints:challenges and opportunities	Seminar	2	0.4	18/05/2020	Prof. Luca Chiaraviglio	N
“Joint Design of Optics and Post-Processing Algorithms Based on Deep Learning for Generating Advanced Imaging Features”.	Seminar	2	0.4	19/05/2020	Raja Gyres. IEEE Computational Imaging Technical Committee	N
Virtual Seminars on “Sensing”	Seminar	4	0.8	20/05/2020	Prof. Carlo Forestiere, DIETI,	Y
In dato veritas.Bugie e verità della data analysis	Seminar	2	0.4	21/05/2020	Innovation Village	Y
“Bias from the wild”. Part of the CVLP Computer Vision and Machine Learning on-line seminar series.	Seminar	2	0.4	26/05/2020	Prof. Nello Cristianini	N
“Noninvasive Mapping of Electrical Properties using MRI”.	Seminar	1,5	0.3	11/06/2020	Prof. Riccardo Lattanzi	N
Introduzione ai microcontrollori e controlli dei motori elettrici	Course		3	16-18 Giugno	Ing. Alan Smith STMicroelectronics	Y
Misure su sistemi wireless,	Course		9	06 Luglio	Prof. Angrisani Leopoldo	Y

1) Courses, Seminar, Doctoral School, Research, Tutorship

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2) Choose: Y or N

2.1. Study and training activities - credits earned

	Courses	Seminars	Research	Tutorship	Total
Bimonth 1	0	0	10	0	10
Bimonth 2	9	0	4	0	13
Bimonth 3	0	0.6	5	0	5.6
Bimonth 4	5	5.3	6	0	16.3
Bimonth 5	12	0	5	0	17
Bimonth 6	3	0	5	0	8
Total	29	5.9	35	0	69.9
Expected	30 - 70	10 - 30	80 - 140	0 - 4.8	

3. Research activity:

My research activities were focused on the measurement of Power System Stability. It is defined as the ability of an electrical system to find a new equilibrium condition following a disturbance, in which the system is intact, except for the protections that have been voluntarily tripped. Power system stability phenomena can be classified into three categories: rotor angle stability, frequency stability, and voltage stability.

In the current year, the attention is paid to the detection of low-frequency oscillations (LFOs) that are phenomena related to rotor angle stability. The problem of oscillations has been well known for some time, there is still no rigorous and precise solution to monitor and obtain information in real time. Various types of algorithms have been developed and available in scientific literature and they all correspond to two different types of approach:

- Model-Based;
- Signal-Based;

At the moment I have analysed the first one, with particular attention to the Practical Swarm Optimization (PSO) and Hilbert Transform method.

The results obtained in this first year involve the implementation of a benchmark to reproduce the real network system used by the Italian TSO (Transmission System Operator) in order to test the algorithms implemented according to the methods found in the literature

4. Research products:

- "A PSO-MMA method for the parameters estimation of inter-area oscillations in electrical grids,"
Bonavolontà, L. P. Di Noia, A. Liccardo, S. Tessitore and D. Lauria,

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IEEE Transactions on Instrumentation and Measurement, doi: 10.1109/TIM.2020.2998909.

5. Conferences and seminars attended

- *"A novel PSO-CWA algorithm for the estimation of inter-area oscillation parameters," Leopoldo Angrisani; Francesco Bonavolontà; Luigi Pio Di Noia; Davide Lauria; Annalisa Liccardo; Salvatore Tessitore; Davide Ruggiero*
IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Dubrovnik, Croatia, 2020, pp. 1-6, doi: 10.1109/I2MTC43012.2020.9128935.
- *"Parameter Identification of Interarea Oscillations in Electrical Power Systems via an Improved Hilbert Transform Method,"*
Enrico Maria Carlini; Giorgio Maria Giannuzzi; Roberto Zaottini; Cosimo Pisani; Salvatore Tessitore; Annalisa Liccardo; Leopoldo Angrisani,
55th International Universities Power Engineering Conference (UPEC), Torino, Italy, 2020, pp. 1-6, doi: 10.1109/UPEC49904.2020.9209805.

6. Activity abroad:

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7. Tutorship

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