



PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

PhD Student: Andrea Cervone

XXXIII Cycle

Training and Research Activities Report – First Year

Tutor: Gianluca Brando

1. Informations

- a. Andrea Cervone
- b. Master Degree in Electrical Engineering – Università di Napoli Federico II
- c. XXXIII Cycle- ITEE – Università di Napoli Federico II
- d. Tutor: Ing. Gianluca Brando

2. Study and Training activities

a. Courses:

- i. Nonlinear Systems (Mathematical Engineering) – Prof. Mario di Bernardo
- ii. Delay Differential Equations (Modulo Occasionale) – Prof. John Hogan
- iii. Electrodynamics of Continuous Media (Mathematical Engineering) – Prof. Claudio Serpico
- iv. Modelli Numerici per i Campi (Electrical Engineering) – Prof. Guglielmo Rubinacci

b. Seminars:

- i. From Engineering to Mathematics and the other way round: two nonlinear case examples – Prof. Josep M. Olm
- ii. New Electrical Architectures of Modern Aircrafts – Prof. Maria Angeles Martin Prats
- iii. Enabling the Innovators and Entrepreneurs of tomorrow - Prof. Xiao Xi; Mr. Wang Jian
- iv. A strategy for energy saving in DC-electrified railway systems utilizing energy storage devices - Mr. Hiroyasu Kobayashi
- v. Dalla teoria dei grafi all'elaborazione dei segnali su grafo - Prof. Sergio Barbarossa
- vi. Elettromagnetismo Computazionale: formulazioni e metodi differenziali ed integrali - Prof. Salvatore Alfonzetti
- vii. Riduzione d'ordine e modellistica comportamentale: teoria e applicazione a Signal e Power Integrity - Prof. Stefano Grivet-Talocia
- viii. Computational Intelligence: dalle metodologie ai contesti applicativi - Prof. Alessandro Salvini
- ix. Author Seminar: How to publish a scientific paper - Aliaksandr Birukou; Elisa Magistrelli
- x. Logic Based Languages and Systems for Big Data Applications - Prof. Carlo Zaniolo

c. External courses:

- i. European PhD School on Power Electronics, Electrical Machines, Energy Control and Power Systems - 19th Edition (Gaeta) – Prof. Levi, Dr. Bayerer, Dr. Colak, Dr. Freijedo et al.
- ii. Roma Tre Summer Course on Power Electronics and Applications (Week 1) Power Electronics in Electric Grid Applications - Prof. Mattavelli, Prof. Vukosavic, Dr. Grbovic et al.
- iii. Roma Tre Summer Course on Power Electronics and Applications (Week 2) Practice on Power Electronics – Prof. Lidozzi

3. Research activity

- a. Multilevel and Multiphase Power Converters
- b. Study on the Design and Control of Multilevel and Multiphase Converters for Electrical Drives and for Grid-Connected Plants
- c. The research focuses on the modelling of the system, on the analysis and design of novel Pulse Width Modulation (PWM) techniques and on the internal (inner voltage equalization) and external (current control or voltage stabilization) of non-conventional converters for high power or high reliability applications
- d. Collaborations with Getra Power S.P.A.

4. Products

a. Publications

i. Published Journal Papers

1. Brando, Gianluca & Bova, Biagio & Cervone, Andrea & Dannier, A & Pizzo, A. (2018). A Distribution Power Electronic Transformer with MMC. Applied Sciences. 8. 120. 10.3390/app8010120.

ii. Published Conference Papers

1. An Adaptive Balancing Modulation for Multilevel Diode Clamped Converters without Common Mode Voltage Injection; "Brando, G., Cervone, A., Del Pizzo, A., Meo, S." ; SPEEDAM 2018 - Proceedings: International Symposium on Power Electronics, Electrical Drives, Automation and Motion
2. A Novel Current References Limitation Strategy in Mono-Inverter Dual PMSM Drives; "Cervone, A., Di Noia, L.P., Rizzo, R., Spina, I."; Proceedings - 2018 23rd International Conference on Electrical Machines, ICEM 2018
3. A Constrained Optimal Model Predictive Control for Mono Inverter Dual Parallel PMSM Drives; "A. Cervone, L. P. Di Noia, R. Rizzo, I. Spina, R. Miceli"; 2018 7th International Conference on Renewable Energy Research and Applications (ICRERA)
4. A Novel Inductor Based Balancing Circuit for Diode Clamped Converters; G. Brando, A. Cervone; IECON 2018 - 44th Annual Conference of the IEEE Industrial Electronics Society
5. Novel Balancing Approach for Multilevel Diode Clamped Converters in Medium Voltage Hybrid STATCOM Application; G. Brando, A. Cervone; IECON 2018 - 44th Annual Conference of the IEEE Industrial Electronics Society

iii. Papers in Preparation

1. Harmonic Balance-Based Space Vector Approach for MMC Inter-Leg Equalization

b. Patents

-

5. Conferences and Seminars

a. SPEEDAM 2018

International Symposium on Power Electronics, Electrical Drives, Automation and Motion – 24th Edition

Amalfi (Italy) – 20-22 June 2018

Presentation of the paper "*An Adaptive Balancing Modulation for Multilevel Diode Clamped Converters without Common Mode Voltage Injection*"

b. IECON 2018

44th Annual Conference of the IEEE Industrial Electronics Society

Washington D.C. (USA) – 21-23 October 2018

Presentation of the paper "*A Novel Inductor Based Balancing Circuit for Diode Clamped Converters*"

Presentation of the paper "*Novel Balancing Approach for Multilevel Diode Clamped Converters in Medium Voltage Hybrid STATCOM Application*"

6. Activity abroad

-

7. Tutorship

-

Student: Andrea Cervone
andrea.cervone@unina.it

Tutor: Ing. Gianluca Brando
gianluca.brand@unina.it

Cycle XXXIII

	Credits year 1						Credits year 2						Credits year 3													
	Estimated	1	2	3	4	5	6	Summary	Estimated	1	2	3	4	5	6	Summary	Estimated	1	2	3	4	5	6	Summary	Total	Check
Modules	30	0	0	3	15	9	9	36							0									0	36	30-70
Seminars	10	0,4	1,2	2	0	3	0,4	7							0									0	7	10-30
Research	20	5	0	5	0	20	0	30							0									0	30	80-140
	60	5,4	1,2	10	15	32	9,4	73	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	73	180

Year	Lecture/Activity	Type	Credits	Certification	Notes
1	A strategy for energy saving in DC-electrified railway systems utilizing energy storage devices, Lecturer: Mr. Hiroyasu Kobayashi, 05/02/2018	Seminar	0.4	x	
1	Logic Based Languages and Systems for Big Data Applications; Prof. Carlo Zaniolo; 13/03/2018 – 15/03/2018	Seminar	0.8	x	
1	Enabling the Innovators and Entrepreneurs of tomorrow; Prof. Xiao Xi and Mr. Wang Jian; 17/04/2018	Seminar	0.4	x	
1	European PhD School on Power Electronics, Electrical Machines, Energy Control and Power Systems - 19th Edition (Gaeta)	Doctoral School	3	x	
1	New Electrical Architectures of Modern Aircrafts; Prof. Maria Angeles Martin Prats; 07/05/2018 – 10/05/2018 – 11/05/2018	Seminar	0.8	x	
1	From Engineering to Mathematics, and the other way round: two nonlinear case examples; Prof. Josep M. Olm; 05/06/2018	Seminar	0.6	x	
1	Dalla teoria dei grafi all'elaborazione dei segnali su grafo; Prof. Sergio Barbarossa; 13/06/2018; Università di Roma La Sapienza	Seminar	0.6	x	Corso Breve della Gasparini PhD School
1	Roma Tre Summer Course on Power Electronics and Applications (Week 1) Power Electronics in Electric Grid Applications"; 02-06 Luglio	Doctoral School	3	x	
1	"Roma Tre Summer Course on Power Electronics and Applications (Week 2) Practice on Power Electronics" 09-14 Luglio	Doctoral School	3	x	
1	Nonlinear Systems (Mathematical Engineering); Prof. Mario di Bernardo; 27/07/2018	MS Module	6	x	
1	Delay Differential Equations; Prof. John Hogan; 27/07/2018	Ad Hoc Module (Occasional)	3	x	Esame Sostenuto con il Prof. Mario di Bernardo
1	Electrodynamics of Continuous Media (Mathematical Engineering); Prof. Claudio Serpico; 14/09/2018	MS Module	9	x	
1	Elettromagnetismo Computazionale: formulazioni e metodi differenziali ed integrali; Prof. Salvatore Alfonzetti; 15-18 Ottobre 2018	Seminar	1	x	Corso Breve della Gasparini PhD School
1	Riduzione d'ordine e modellistica comportamentale: teoria e applicazione a Signal e Power Integrity; Prof. Stefano Grivet-Talocia; 18-19 Ottobre 2018	Seminar	1	x	Corso Breve della Gasparini PhD School
1	Computational Intelligence: dalle metodologie ai contesti applicativi; Prof. Alessandro Salvini; 15-17 Ottobre 2018	Seminar	1	x	Corso Breve della Gasparini PhD School
1	Modelli Numerici per i Campi (Electrical Engineering); Prof. Guglielmo Rubinacci; 21/12/2018	MS Module	9	x	
1	Author Seminar: How to publish a scientific paper; "Aliaksandr Birukou and Elisa Magistrelli"; 26/11/2018	Seminar	0.4	x	

CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Module Title NON LINEAR SYSTEMS

Lecturer prof M di Bernardo

Dates II semestre 2018 (Mathematical Eng.)

Student Andrea Corvone

Cycle XXXIII

Credits earned 6 CFU

Lecturer signature



Above information are provided to attest that the student attended lessons relevant to the module held in the indicated period.

Earned Credits depend on the student performance in the module activities and are provided and certified by the lecturer. The amount of earned credits is usually limited to the number or credits reported in the List of Modules relevant to the ITEE PhD. If the case, the lecturer is kindly requested to shortly motivate why the earned credits exceeds this limit.

CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Module Title DELAY DIFFERENTIAL EQUATIONS

Lecturer PROF. JOHN HOGAN (BRISTOL)

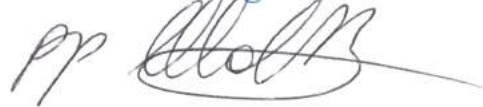
Dates 02/07 10:00-12:00 ; 03/07 14:00-16:00 ; 04/07 14:00-16:00 ;
05/07 14:00-16:00 ; 06/07 14:00-16:00

Student ANDREA CERVONE

Cycle XXXIII

Credits earned 3 CFU

Lecturer signature



Above information are provided to attest that the student attended lessons relevant to the module held in the indicated period.

Earned Credits depend on the student performance in the module activities and are provided and certified by the lecturer. The amount of earned credits is usually limited to the number or credits reported in the List of Modules relevant to the ITEE PhD. If the case, the lecturer is kindly requested to shortly motivate why the earned credits exceeds this limit.

CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Module Title ELECTRODYNAMICS OF CONTINUOUS MEDIA

Lecturer PROF. CLAUDIO SERPICO

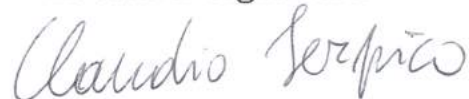
Dates II SEMESTRE 2018 (MATHEMATICAL ENGINEERING)

Student ANDREA CERYONE

Cycle XXXIII

Credits earned 9 CFU

Lecturer signature



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CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Module Title Modelli Numerici per i Campi

Lecturer G. RUBINACCI

Dates 21/12/2018

I Semester 2018/2019 (Electrical Engineering)

Student ANDREA CORUONIS

Cycle XXXIII

Credits earned 3 CFU

Lecturer signature

Above information are provided to attest that the student attended lessons relevant to the module held in the indicated period.

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EUROPEAN PHD SCHOOL

POWER ELECTRONICS ELECTRICAL MACHINES ENERGY CONTROL
AND POWER SYSTEMS

19th Edition

Gaeta (Italy) May 21-25, 2018

CERTIFICATE OF ATTENDANCE

This is to certify that

Andrea Cervone

has successfully attended the 19th Edition of the European
Ph.D. School: Power Electronics, Electrical Machines, Energy Control
& Power Systems, held in Gaeta, Italy, on May 21-25, 2018.



Associazione Nazionale
Azionamenti Elettrici ONLUS

Via G. Di Blasio, 43

03043 CASSINO (FR) - ITALY

C.F. 10159900157 - P.IVA 02275110134

Prof. Giuseppe Tomasso

Chair of the European PhD School

University of Cassino and Southern Lazio



EUROPEAN PHD SCHOOL

POWER ELECTRONICS ELECTRICAL MACHINES ENERGY CONTROL
AND POWER SYSTEMS

19th Edition

Gaeta (Italy) May 21-25, 2018

CERTIFICATE OF ATTENDANCE

Andrea Cervone

has successfully completed the following courses:

- R. Bayerer** - Power Circuits for Clean Switching and Low Losses
- E. Levi** - Multi-phase drive and generation systems for advanced industrial applications
- O. Stalter** - About the role of power electronics in the grid until 2050
- C. Haag, C. Loef, G. Gurses** - DC Grids

Electrical Machine and Drives Session

- I. Colak** - EMC in Power electronics and design for EMC
- M. Pennese** - The revenge of electric vehicles: from regulations to technologies scenario
- F. D. Frejedo** - Grid Connected Converters

UNIVERSITÀ DEGLI STUDI DI GAETA
DIPARTIMENTO DI INGEGNERIA
ELETTRICA ED ELETTRONICA
VIA S. PIETRO 103
04013 GAETA (LT) ITALIA
TEL. +39 0474 371111 FAX. +39 0474 371112

Roma Tre Summer Course on Power Electronics and Applications

Roma Tre University – Department of Engineering
Mechanical Engineering Committee

Certificate of Attendance

presented to

Andrea Cervone

for Attending the Roma Tre Summer Course on
Power Electronics and Applications – 4th edition

Week1 - 3 ECTS, July 2nd – July 6th
Power Electronics in Electric Grid Applications

Technical Sponsorship

ECPE – European Center for Power Electronics

In cooperation with

National Instruments, Semikron, Huawei Technologies, ST
Microelectronics, The University of Nottingham, University of
Alcalá, University of Belgrade, University of Padova, University of
Roma Tor Vergata

Chairman

Fabio Crescimbinì

Lecturers

Stefano Bifaretti, Fabio Brucchi, Emilio Bueno, Valeriano Cardi,
Petar Grbovic, Alessandro Lidozzi, Paolo Mattavelli, Vladimir
Scarpa, Slobodan Vukosavic, Pericle Zanchetta

Date,

06 LUG. 2018

Course Chairman (Prof. Fabio Crescimbinì)



Head of the Teaching Committee (Prof. Antonio Casimiro Caputo)





Roma Tre Summer Course on Power Electronics and Applications

Roma Tre University – Department of Engineering
Mechanical Engineering Committee

Certificate of Attendance

presented to

Andrea Cervone

for Attending the Roma Tre Summer Course on
Power Electronics and Applications – 4th edition

Week2 - 3 ECTS, July 9th – July 14th
Practice on Power Electronics

Technical Sponsorship

ECPE – European Center for Power Electronics

In cooperation with

National Instruments, Semikron, Huawei Technologies, ST Microelectronics, The University of Nottingham, University of Alcalá, University of Belgrade, University of Padova, University of Roma Tor Vergata

Chairman

Fabio Crescimbinì

Lecturers

Stefano Bifaretti, Fabio Brucchi, Emilio Bueno, Valeriano Cardi, Petar Grbovic, Alessandro Lidozzi, Paolo Mattavelli, Vladimir Scarpa, Slobodan Vukosavic, Pericle Zanchetta

Date, **13 LUG. 2018**

Course Chairman (Prof. Fabio Crescimbinì)



Head of the Teaching Committee (Prof. Antonio-Casimiro Caputo)







CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Seminar Title From engineering to mathematics (and the other way round): two nonlinear case examples
Lecturer Josep M. Olm, Universitat Politècnica de Catalunya, Barcelona, Spain
Organizer Prof. Mario di Bernardo, DIETI
Date 05/06/2018

Student CERVONE ANDREA

Cycle XXXIII

Credits earned 0.6

Organizer or Lecturer signature

Above information are provided to attest that the student attended the seminar held in the indicated date.

Earned Credits depend on the student performance in the seminar activities and are provided and certified by the organizer or the lecturer. The standard number of earned credits is usually of 0.2 credits per seminar hour and are credited providing the student actively participated to the seminar. Extra activities subsequently performed by the student and related to the seminar content can lead to extra credits up to 1 credit per seminar hour. If the case, the organizer is kindly requested to shortly motivate the number of extra earned credits.



CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Seminar Title NEW ELECTRICAL ARCHITECTURES OF MODERN AIRCRAFT

Lecturer PROF. MARIA ANGELES MARTIN PRATS

Organizer PROF. FRANCESCO MARULO

Date 07/05 ; 10/05 ; 11/05 2018

Student CERVONE ANDREA

Cycle XXXIII

Credits earned 0.8

Organizer or Lecturer signature

Francesco Marulo

Above information are provided to attest that the student attended the seminar held in the indicated date.

Earned Credits depend on the student performance in the seminar activities and are provided and certified by the organizer or the lecturer. The standard number of earned credits is usually of 0.2 credits per seminar hour and are credited providing the student actively participated to the seminar. Extra activities subsequently performed by the student and related to the seminar content can lead to extra credits up to 1 credit per seminar hour. If the case, the organizer is kindly requested to shortly motivate the number of extra earned credits.



CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Seminar Title ENABLING THE INNOVATORS AND
ENTREPRENEURS OF TOMORROW

Lecturer PROF. XIAO XI ; MR. WANG JIAN

Organizer PROF. GIORGIO VENTRE


Date 17/04/2018

Student CERVONE ANDREA

Cycle XXXIII

Credits earned

0.4


Organizer or Lecturer signature


Above information are provided to attest that the student attended the seminar held in the indicated date.

Earned Credits depend on the student performance in the seminar activities and are provided and certified by the organizer or the lecturer. The standard number of earned credits is usually of 0.2 credits per seminar hour and are credited providing the student actively participated to the seminar. Extra activities subsequently performed by the student and related to the seminar content can lead to extra credits up to 1 credit per seminar hour. If the case, the organizer is kindly requested to shortly motivate the number of extra earned credits.



CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Seminar Title LOGIC BASED LANGUAGES AND SYSTEMS FOR
BIG DATA APPLICATIONS

Lecturer CARLO ZANIOLO

Organizer ANTONIO PICARIELLO

Date 13/03/2018 ; 15/03/2018

Student ANDREA CERYONE

Cycle XXXIII

Credits earned 0.8

Organizer or lecturer signature

Above information are provided to attest that the student attended the seminar held in the indicated date.

Earned Credits depend on the student performance in the seminar activities and are provided and certified by the organizer or the lecturer. The standard number of earned credits is usually of 0.2 credits per seminar hour and are credited providing the student actively participated to the seminar. Extra activities subsequently performed by the student and related to the seminar content can lead to extra credits up to 1 credit per seminar hour. If the case, the organizer is kindly requested to shortly motivate the number of extra earned credits.



CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Seminar Title A STRATEGY FOR ENERGY SAVING IN DC-ELECTRIFIED RAILWAY SYSTEM UTILIZING ENERGY STORAGE DEVICES

Lecturer HIROYASU KOBAYASHI

Organizer PROF. DIEGO IANNUZZI

Date 05/02/2018

Student CERYONE ANDREA

Cycle XXXIII

Credits earned 0.4

Organizer or Lecturer signature

Above information are provided to attest that the student attended the seminar held in the indicated date.

Earned Credits depend on the student performance in the seminar activities and are provided and certified by the organizer or the lecturer. The standard number of earned credits is usually of 0.2 credits per seminar hour and are credited providing the student actively participated to the seminar. Extra activities subsequently performed by the student and related to the seminar content can lead to extra credits up to 1 credit per seminar hour. If the case, the organizer is kindly requested to shortly motivate the number of extra earned credits.



GRUPPO NAZIONALE DI ELETTROTECNICA

Scuola Nazionale Dottorandi di Elettrotecnica

“Ferdinando Gasparini”

ATTESTATO DI FREQUENZA

Attività didattica associata a ET2018
(ROMA, 13 GIUGNO 2018)

Corso Breve

“Dalla Teoria dei Grafi all’Elaborazione dei Segnali su Grafo”

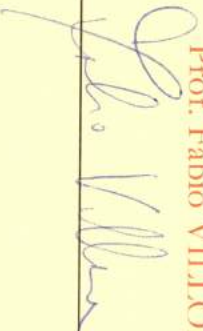
“From Graph Theory to Signal Processing on Graphs”

Prof. Sergio Barbarossa, Università degli Studi di Roma “La Sapienza”

dott. **Andrea Cervone**

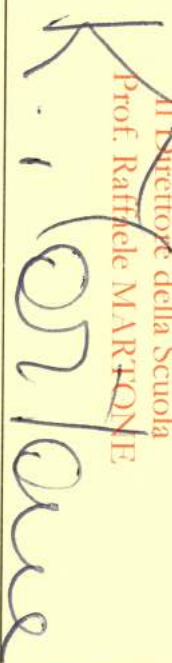
Il Presidente del Gruppo Nazionale di Elettrotecnica

Prof. Fabio VILLONE



Il Direttore della Scuola

Prof. Raffaele MARONE



GRUPPO NAZIONALE DI ELETTROTECNICA

Scuola Nazionale Dottorandi di Elettrotecnica
“*Ferdinando Gasparini*”

TWENTYSECOND STAGE

(Napoli, 15-19 ottobre 2018)

CERTIFICATE OF ATTENDANCE

dott. Andrea CERVONE

Il Presidente del Gruppo Naz. di Elettrotecnica
Prof. Fabio VILLONE



Il Direttore della Scuola
Prof. Raffaele MARTONE



CREDITS ATTESTATION

PhD in Information Technology and Electrical Engineering

Università degli Studi di Napoli Federico II

Module Title AUTHOR SEMINAR : HOW TO PUBLISH A SCIENTIFIC PAPER

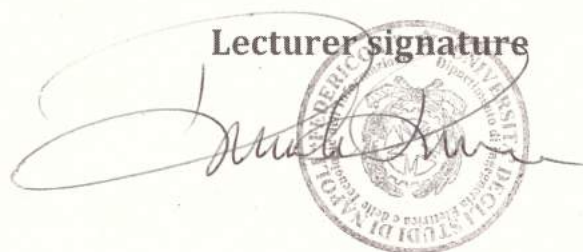
Lecturer ALIAK SANDR BIRUKOU , EUSA MAGISTRELLI

Dates 26/11/2018 - 14:00/16:00

Student CERVONE ANDREA

Cycle XXXIII

Credits earned 0,4

Lecturer signature


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Andrea Cervone
Università degli Studi Federico II di Napoli
DIETI

Dr. Elisa Magistrelli
Account Development
Manager

Springer Nature

elisa.magistrelli@springer.com

Milano, 29 Novembre 2018

Attestato di partecipazione AUTHOR SEMINAR

Si attesta che Andrea Cervone ha partecipato all'Author Seminar Springer Nature svoltosi a Napoli presso la Sala Softel , il giorno 26 Novembre 2018, dalle ore 14.00 alle ore 16.00.

Cordiali saluti,

Elisa Magistrelli
Account Development Manager
Springer Nature

