Federico **Cecati**

Control Engineer · Pianist and Composer

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Basic Information

Date of birth	4th May 1994
Gender	Male
Nationality	Italian
Civil Status	Unmarried
Language	Italian(*Mothertongue*), English(*Proficient*), German(*Intermediate*)
Driving license	A, B

Engineering Education

Ph.D. Student of Electrical and Control Engeneering with Prof. Marco Liserre

Kiel - Germany

Christian-Albrechts-Universität zu Kiel — *July 2018 - Present*

- He is involved in several research projects on the thema of modelling, stability analysis and control of Power Electronics based Power Systems. He gave lectures for the exercitation part of the class of "Grid Converters for Renewable Energy Systems (GriCoRES)" in the academic years 2018/2019 and 2019/2020. He attended several international conferences including IECON 2018 and IECON 2019, presenting his papers.

M.Sc. in Control Engineering with Honors

L'Aquila - Italy

Università degli Studi dell'Aquila — *October 2015 - October 2017*

- Thesis title: "Modeling and nonlinear closed-loop gait control of humanoid robots ". Supervisor: Prof. Costanzo Manes; Language: English

B.Sc. in ICT Engineering with Honors

L'Aquila - Italy

Università degli Studi dell'aquila — *October 2012 – July 2015*

- Thesis title: "LQR optimal control of a ball-and-plate system mounted on an industrial robot". Supervisor: Prof. Costanzo Manes; Language: Italian

Engineering Projects

EKSH Fellowship

Kiel - Germany

Christian-Albrechts-Universität zu Kiel — *July 2018 - July 2021*

- The project with title "Stability Analysis and Control of a Distribution Grid with High Penetration of Wind Energy" was proposed and approved by Gesellschaft für Energie und Klimaschutz Schleswig-Holstein GmbH (EKSH). The acceptance of the project implies a grant of ca. 55000 € to the candidate distributed in montly rates. Additional information can be found on the EKSH official website . The research project is carried on in collaboration with Prof. Frede Blaabjerg and Prof. Xiongfei Wang from Aalborg university.

Add on Project

Kiel - Germany

Christian-Albrechts-Universität zu Kiel — *July 2018 - July 2021*

- The original german title of the project is "Entwicklung eines Add-Ons für Umrichter zur aktiven Filterung der Netzspannung und Resonanz-Dämpfung basierend auf der gemessenen Netzimpedanz", in english "Design of an Add-on for power converter for active filtering, resonance daping based on measured grid impedance." The project is founded by Bundesministerium für Wirtschaft und Energie (BMWi), and include the German company WS TECH and Fachhochschule Kiel.

HEART project

Kiel - Germany

Christian-Albrechts-Universität zu Kiel — *January 2018 - June 2018*

The complete research project name is "the Highly Efficient And Reliable smart Transformer (HEART), a new Heart for the Electric Distribution System". His researches for this project were focussed on control of the Smart Transformer-Fed Grid with high penetration of renewable energies. Particular attention is posed on the phenomenon of Harmonic Instability caused by frequency couplings, interaction between power converters, computation and transmission delays.

Scientific Publications

Journal Papers

- None

Conference Papers

- [1] F. Cecati, M. Andresen, R. Zhu, Z. Zou and M. Liserre, "Robustness Analysis of Voltage Control Strategies of Smart Transformer," IECON 2018 - 44th Annual Conference of the IEEE Industrial Electronics Society, D.C., DC, USA, 2018, pp. 5566-5573.
- [2] F. Cecati, S. Pugliese, R. Zhu and M. Liserre, "Integration and Optimization of Voltage Active Filtering Functionality in a PV Park," IECON 2019 - 45th Annual Conference of the IEEE Industrial Electronics Society, Lisbon, Portugal, 2019, pp. 4733-4739.

Scientific Activity

Technical Responsable of the organization of the international PhD course "Grid forming Power Converter, Smart Transformers, and Hybrid Grids"

Kiel - Germany

12-14 Februar 2020

He was the responsable for the organization of the industrial PhD course "Grid forming Power Converter, Smart Transformers, and Hybrid Grids" on its edition of the year 2020. The course has the duration of three days and includes both theoretical part, with frontal lectures and a experimental part, with exercitation in the laboratory of the Chair of Power Electronics, University of Kiel. More information can be found in the website of the Chair of Power Electronics

Technical Responsable of the organization of the international PhD course "the Smart Transformer, its Impact on the Electric Grid and Technology Challenges"

Kiel - Germany

13-15 Februar 2019

He was the responsable for the organization of the industrial PhD course "the Smart Transformer, its Impact on the Electric Grid and Technology Challenges" on its edition of the year 2019. The course has the duration of three days and includes both theoretical part, with frontal lectures and a experimental part, with exercitation in the laboratory of the Chair of Power Electronics, University of Kiel.More information can be found in the website of the Chair of Power Electronics

Reviewer for IEEE Transaction on Power Electronics and other Journals

He was invited by the Assiociate Editors to review various scientific papers submitted in the several journals including IEEE Transaction on Power Electronics, IET Power Electronics, Journal of Emerging and Selected Topics in Power Electronics, IEEE Access, CSEE Journal of Power and Energy Systems. Moreover, he reviewed papers submitted in several conference including PCIM Europe 2020, AEIT AUTOMOTIVE 2019 and POWERTECH2019.

Awards & Scholarships

Scientific

2018 — **ESKH Doctoral Scholarship Winner**, He won the scholarship provided by Gesellschaft für Energie und Klimaschutz Schleswig-Holstein GmbH (EKSH). The scholarship provides a montly stipendium for a period of three years to support a research project in the field of energy and climate protection. The title of the presented project is "Stability Analysis and Control of a Distribution Grid with High Penetration of Wind Energy". Additional information can be found on the EKSH official website — *Kiel - Germany*

2016 — **GSSI Scholarship Winner**, he won one of the four scholarships for Master Degree students provided by Istituto Nazionale di Fisica Nucleare (INFN) - Gran Sasso Science Institute (GSSI) branch, with merit. The duration of the scholarship is two years. — *L'Aquila - Italy*

Research Topics and skills

Research Topics

- State Space Modelling of Power Electronics based Power Systems
- Stability Analysis of Power Electronics based Power Systems
- State Space control of grid-connected Power Converters
- Ancillary services optimization in renewable power plants
- Smart Transformer Modelling and Control

Engineering Skills

- Linear Systems Analysis and Control
- NonLinear Systems Analysis and Control
- Power Systems
- Power Electronics
- Model Identification, Kalman Filtering Theory and Stochastic Control
- Digital Electronics, FPGA and MicroController Based Systems
- Linear and Quadratic Programming, Convex Optimization
- Robotics and Motion Control
- Signal Theory, Digital Signal Processing and Filtering
- Audio Processing
- Time-Delay Systems Analysis and Control

Musical Education and Performances

Conservatory Diploma in Piano

L'Aquila - Italy

Conservatory of Music of L'Aquila

October 2004 - July 2017

Ten years Conservatory diploma in Piano, with Maestro Luciano Bellini. In compliance with italian law existing in 2017, the Consevatory diploma is consedered as a Master Degree. Program of the final exam:

- **Bach**: *Italian Concerto*
- **Beethoven**: *Sonata op. 90*
- **Sckjabin**: *Sonata n. 5*
- **Debussy**: *La fille aux cheveux de lin*, *La cathèdrale engloutie*
- **Chopin**: *Nocturne op.37 n. 1, Nocturne op.27 n. 1, Mazurka op.63 n. 2*
- **Saint-Saens**: *Le Cloches de la Palmas*

Music Composition Bachelor Student

L'Aquila - Italy

Conservatory of Music of L'Aquila

October 2013- July 2017

He was admitted to the Composition class at the Conservatory of Music of L'Aquila, ranked first. He was a Bachelor student of Music Composition with Maestro Claudio Perugini as supervisor.

Musical Masters and Performances

Italy

Italy

- He attended with merit several composition masterclasses and seminars. He discussed his musical works with international composers including Sydney Corbett, Alessio Elia, Andrea Portera, gaining their appreciation. His works were performed in several concert halls, including "Auditorium del Parco" in L'Aquila, "Villa Castiglione Music Hall" in Florence, and "Auditorium of The Conservatory of Music of L'Aquila"
- He attended with merit to several piano masterclasses under supervision of musicians like Maestro Fausto Di Cesare, Maestro Massimiliano Scatena and Maestro Luciano Bellini. He plays music by Johann Sebastian Bach, Wolfgang Amadeus Mozart, Ludwig van Beethoven, Fryderyk Chopin, Claude Debussy, Johannes Brahms, Aleksandr Nikolaevič Skrjabin and many others. He has played in several concert halls in Italy
- He attended with merit to several orchestral conducting masterclasses with Maestro Luciano Bellini. Most relevant performances: Beethoven 5th and 7th Symphonies, Dvořák 9th Symphony and Rachmaninov 2nd Piano Concerto performed with Orchestra Internazionale di Roma in "Torti Theater", Bevagna (Perugia) - Italy

Extracurricular Activity

Member of Rock Bands

Keyboard Player

He has been member of several bands playing different genres including Funk, Blues, Hard Rock, Progressive Rock, Classic Rock, Jazz. He likes improvisation, so he often performs in jam sessions in Kiel, in Rome and in L'Aquila.

Theater Acting

L'Aquila - Italy

Theather Actor

Semptember 2014 - November 2016

He has studied theather acting under direction of Mrs. Rosanna Lancione.

Personal Information

About me

I always have a mathematical approach to engineering problems and I like to see how abstract maths takes shape

in real systems. I like to find relationships among apparently far topics and to observe the same problem under several points of view. I love music, cinema and art. I like nature, therefore I practice sports like ski, jogging, mountain biking and sea swimming. In the past I have practiced several team sports like football, basketball, volleyball, handball. I love to travel and meet new people.