

# Curriculum Vitae

## PERSONAL INFORMATION

Name

**Davide Barater**

Orcid ID

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Davide Barater (M'14-S'21) received the Ph.D. degree in Information Technology in 2014 from the University of Parma Italy.

He is currently Associate Professor at the University of Modena and Reggio Emilia, Italy. His research area is focused on power electronics and electrical machines for e-mobility and motor drives.

He is the Coordinator of the European Project AUTO-MEA that aims to develop novel solutions for windings structures based on hairpin technology for improved power density, efficiency and increased frequency operation. <https://www.automea.unimore.it>

He is secretary of the IEEE Industrial electronics society Electrical Machines Technical Committee and Associate Editor of IEEE Transactions on Industry Applications. He is author or co-author of more than 100 papers on scientific journals and international conferences.

## WORK EXPERIENCE

dates (from - to)

April 2021 → Today

Occupation or position held

Associate Professor in Electrical machines and drives

Main activities and responsibilities

High power density and high speed electronic power converters and electrical machines for electric and hybrid and full electric vehicle traction. Diagnostics of electric motors used in avionics for the development of the More Electric Aircraft (MEA).

Employer's name and locality

Department of Engineering Enzo Ferrari, Via P. Vivarelli 10, 41125 Modena, Italy.

dates (from - to)

April 2018 → April 2021

Occupation or position held

Assistant Professor in Electrical machines and drives

Main activities and responsibilities

Electronic power converters and electrical machines for electric and hybrid vehicle traction. Diagnostics of electric motors used in avionics for the development of the More Electric Aircraft (MEA).

Employer's name and locality

Department of Engineering Enzo Ferrari, Via P. Vivarelli 10, 41125 Modena, Italy.

dates (from - to)

December 2015 → April 2018

Occupation or position held

Research Fellow in Electric Engineering

Main activities and responsibilities

Power electronics for renewable energy systems and transport applications. High efficiency DC-DC, DC-AC converters based on wide-bandgap devices, integration into the grid of distributed renewable sources, sensorless control of electrical motors and motor diagnostic for aircraft applications.

Employer's name and locality

Department of Engineering and Architecture at the University of Parma, Parco Area delle Scienze, 181/a 43124 Parma, Italy.

dates (from - to)

February 2014 → December 2015

Occupation or position held

Post Doc Researcher in Power converters for renewable energies.

Main activities and responsibilities

Integration into the grid of low power distributed renewable sources. The activity encompassed:

- The development of a transformerless single-phase PV inverter
- The study of the potential impact of wide-bandgap devices in PV inverter applications in terms of efficiency, cost reduction and lifetime.
- The study of LV grid fed by Solid State Transformer (SST) or Smart Transformer (ST) to overcome grid stability issues due to the widespread diffusion of low power distributed energy sources

Employer's name and locality

Department of Engineering and Architecture at the University of Parma, Parco Area delle Scienze, 181/a 43124 Parma, Italy.

dates (from - to)

September 2010 → 2013

Occupation or position held

Consultant in Electrical Engineering

Main activities and responsibilities

Consulting for the development of power converters and drives.

Employer's name and locality	Raw Power s.r.l. - legal base: Via Alberto Pansa, 47 - 42100 Reggio Emilia (RE) - Italy
dates (from - to)	July 2009 → July 2010
Occupation or position held	Receiver of a post-graduate grant
Main activities and responsibilities	Study and development of a 3 kW transformerless PV converter. The activity comprehended the HW design, the realization of prototype converter, firmware development and project validation assessing the compliance of the prototype to EMI standards and grid connection standards (Italian ENEL DK5940V2).
Employer's name and locality	CONSORZIO SPINNER, Villa Gandolfi Pallavicini Via Martelli 22-24, 40138 - Bologna, Italy
<b>RESEARCH INTEREST AND EXPERTISE</b>	<p>Power Electronics with focus on: Distributed Generation and Renewable Energies (10 years), Electric Drives (10 years), Aerospace (7 years), Reliability (5 years).</p> <p>He is the author or co-author of over 80 international publications, 23 of which are journals and 49 of international conference proceedings in the field of electrical converters, machines and drives.</p> <p>The publications, according to source, totaled a total number of citations equal to 1110 with calculated h-index equal to 18 (September 2021).  <a href="https://www.scopus.com/authid/detail.uri?authorId=35182543800">https://www.scopus.com/authid/detail.uri?authorId=35182543800</a></p> <p>On google scholar citations are 1391 with calculated h-index equal to 19 and i10-index 30 (September 2021).  <a href="https://scholar.google.com/citations?hl=it&amp;user=Duy49k8AAAAJ">https://scholar.google.com/citations?hl=it&amp;user=Duy49k8AAAAJ</a></p>
<b>EDUCATION AND TRAINING</b>	
dates (from - to)	January 2011 - March 2014
qualification awarded	Phd in Information Technologies, main topic: topologies for photovoltaic grid-connected power converters
education or training organization's name and locality'	Department of Information Engineering at the University of Parma, Parco Area delle Scienze, 181/a 43124 Parma, Italy
dates (from - to)	March 2009
qualification awarded	Master degree in Electronic Engineering
Final Mark	110/110 Magna cum Laude
Thesis' title	Grid connected converters without galvanic insulation for PV applications
education or training organization's name and locality'	University of Parma, Italy
dates (from - to)	December 2005
qualification awarded	Bachelor's degree in Electronic Engineering
Final Mark	110/110 Magna cum Laude
Thesis' title	Realization of a system for the testing of a motor control unit: organization and management of digital signals
education or training organization's name and locality'	University of Parma, Italy
<b>SCIENTIFIC ACTIVITIES IN INTERNATIONAL ORGANIZATIONS</b>	<p>Secretary of IEEE IES Electrical Machines Technical Committee</p> <p>General chair of the 2021 IEEE Workshop on Electrical Machine Design, Control and Diagnostics (WEMDCD), 8-9 APRIL 2021 <a href="http://www.wemdc2021.unimore.it">http://www.wemdc2021.unimore.it</a></p> <p>Associate Editor of IEEE Transactions on Industry Applications, committee Industrial Drives</p> <p>Special session chair "Power Electronics and Drive Systems for Aerospace Applications" at IECON 2017 - 43rd Annual Conference of the IEEE, Beijing (China), 29 Oct-1 Nov. 2017.</p> <p>Special session chair "Ultra-Reliable Power Conversion for More Electric Transports" at IECON 2019 - 45th Annual Conference of the IEEE, Lisbon (Portugal), 14-17 October 2019.</p>

Topic chair for the conference Energy Conversion Congress and Exposition (ECCE) in 2015, 2016, 2017

Reviewer for the following journal:

- IEEE Transactions on Power Electronics
- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Industrial Informatics
- IEEE Transactions on Industry Applications

Senior Member IEEE and member of the following society:

- Institute of Electrical & Electronics Engineers (IEEE)"
- IEEE Industrial Electronics Society
- IEEE Industry Applications Society
- IEEE Power Electronics Society
- IEEE Dielectrics and Electrical Insulation Society

Member of the IEEE-IES Technical Committee on Renewable Energy System

## **NATIONAL and INTERNATIONAL PROJECT**

Principal Investigator (Coordinator) of RAISE Project (Reliable Aircraft electrical Insulation System sElection), for a total funding of about € 400k from the European Community: Horizon 2020, Clean Sky 2, call JTI-CS2-2017-CfP06-SYS-03 -12

The project aims to identify the impact of high voltage gradients ( $dv / dt$ ), introduced by the rapid switching of the new wide-bandgap power devices, on the lifetime of the winding system of electric motors.

Principal Investigator (Coordinator) of AUTO-MEA Project (Automated Manufacturing of wound components for next generation Electrical machines), for a total funding of about € 1100k: Horizon 2020, Clean Sky 2, call JTI-CS2-2018-CfP09-SYS-03-19

The project aims to identify innovative solutions for the structure of the windings of electric motors for transport applications, capable of allowing high power densities and low losses even in the case of high-speed machines with high operating frequency.

Unit coordinator of the DORNA Project Unit (Development of high reliability motor drives for next generation propulsion applications), for a total funding of about 1100k € by the European Community Horizon 2020 program - Marie Skłodowska-Curie Actions - Research and Innovation Staff Exchange (RISE), Call: H2020-MSCA-RISE-2019.

The project aims to create, through exchange and cross-sectoral and international contamination, synergies between academic and industrial sectors at European level to train a new generation of researchers and professionals able to successfully tackle the challenges of electrification in the sector automotive.

Unit coordinator Green SEED Project (Design of more electric tractors for more suitable agriculture), for a total funding of about € 514k, Italian program PRIN2017 - youth line

The project aims to identify solutions for the hybridization or purely electrical realization of agricultural machines, in order to reduce the environmental impact and the production of CO<sub>2</sub>. The study includes the identification of the best topology of the electrification structure to be adopted, the analysis of the load requirements for the different operations and the design of the traction components.

## **EXPERT ROLES**

EU Expert - Expert reviewer for the European Commission (electrical and electronic, aerospace and transport applications)