Davide De Simone

Curriculum Vitae

ORCID: 0000-0001-9851-7347

Education

2017–2021 **European PhD in Electrical Engineering**, *cum laude*, Politecnico di Milano, Milan.
PhD Dissertation on *Modular Multilevel Converter With Integrated Storage System for Automotive Applications*

Nov. 2018 – March 2019 **Visiting PhD**, University of Birmingham, Birmingham, United Kingdom.
Main activities: *Implementation and testing on FPGA-based controllers of modulation techniques for modular multilevel converters.*

July 2018 **European PhD School**, Università degli Studi Roma Tre, Rome, Italy.
Power Electronics and Applications.

May 2018 **European PhD School**, Gaeta, Gaeta, Italy.
Power Electronics: Design and Developments.

2015–2017 **Master of Science in Electrical Engineering**, *110/110 cum laude*, Politecnico di Milano, Milan.
MSc thesis on *Modular Multilevel Converters for Automotive Applications.*

2012–2015 **Bachelor of Engineering in Electrical Engineering**, *102/100* Politecnico di Milano, Milan.

2007–2012 **Diploma Liceo Scientifico Tecnologico**, *92/100* Liceo Scientifico Vittorio Sereni, Luino (VA).

Work Experiences

Lug. 2023 – Now **Assistant professor (RTDA)**, Politecnico di Milano, Milan, Italy.
Research carried on in the *Power electronics, Drives and Storage Systems (PeDS) laboratory.*

Mar. 2022 – Lug. 2023 **Research Fellow (Assegnista di Ricerca)**, Politecnico di Milano, Milan, Italy.
Project name: *Modular multilevel converters for automotive and stationary applications.*
Research carried on in the *Power electronics, Drives and Storage Systems (PeDS) laboratory.*

Jan.2021 – Mar. 2022 **Electronic R&D Engineer**, NHOA Energy, Milan, Italy.
Main activities: *Multilevel converters, digital controllers, power electronics.*

Teaching Experiences

Industrial Training Courses

A.Y. 2022/2023 **Lecturer for OMRON training courses**, MADE Competence Center, Milan, Italy.
Power electronics, electrical machines and applied industrial electrical drives. Duration: 24h.

Passion in Action

A.Y. 2022/2023 (II semester) **Laboratory Manager and Activity Manager (Responsabile di laboratorio e delle attività)**, Politecnico di Milano, Milan, Italy.
Student competition: control to maximize the vehicle range of electric vehicles. Duration: 20h.

A.Y. 2022/2023 (I semester) **Laboratory Manager and Activity Manager (Responsabile di laboratorio e delle attività)**, Politecnico di Milano, Milan, Italy.
Student competition: control to maximize the vehicle range of electric vehicles. Duration: 20h.

A.Y. 2019/2020 **Activity Manager and Laboratory Manager (Responsabile di laboratorio e delle attività)**, Politecnico di Milano, Milan, Italy.
Student competition: control to maximize the vehicle range of electric vehicles. Duration: 14h.

Master's Degree Courses

A.Y. 2020/2021 **Teaching assistant (Esercitatore)**, Politecnico di Milano, Milan, Italy.
Electrical Drives, MSc in Electrical Engineering. Duration: 50h.

A.Y. 2019/2020 **Teaching assistant (Esercitatore)**, Politecnico di Milano, Milan, Italy.
Electrical Drives, MSc in Electrical Engineering. Duration: 32h.

A.Y. 2018/2019 **Teaching assistant (Esercitatore)**, Politecnico di Milano, Milan, Italy.
Electrical Drives, MSc in Electrical Engineering. Duration: 32h.

A.Y. 2017/2018 **Teaching assistant (Esercitatore)**, Politecnico di Milano, Milan, Italy.
Electrical Drives, MSc in Electrical Engineering. Duration: 32h.

Bachelor's Degree Courses

A.Y. 2022/2023 **Teaching assistant (Esercitatore)**, Politecnico di Milano, Milan, Italy.
Macchine Elettriche e Azionamenti. BSc in Automation Engineering. Duration: 42h.

A.Y. 2018/2019 **Teaching assistant (Esercitatore)**, Politecnico di Milano, Milan, Italy.
Macchine Elettriche, BSc in Electronics Engineering. Duration: 8h.

A.Y. 2017/2018 **Teaching assistant (Esercitatore)**, Politecnico di Milano, Milan, Italy.
Macchine Elettriche, BSc in Electronics Engineering. Duration: 8h.

Financed Researches

2023-Now **Partecipation in European Project**, V-ACCESS.
Vessel Advanced Clustered and Coordinated Energy Storage Systems

2022-Now **Partecipation in Research Contract**, Politecnico di Milano, Milan, Italy.
Analysis, sizing and simulation of a linear actuator to drive an electric bike Anti-Lock Braking System, BlueBrake S.p.A.

2020 - 2021 **Partecipation in Research Contract**, Politecnico di Milano, Milan, Italy.
Sizing, construction, programming and testing of an inverter for the premagnetization of MV/LV transformers, TMC Transformers.

2018 - 2020 **Partecipation in Research Contract**, Politecnico di Milano, Milan, Italy.
Study and prototype production of an electric drive for avionics applications, Fondazione Foresio.

List of Scientific Publications

International Journals

Feb.-2023 [J.4] **Optimal components selection for a DAB model of CHB converter**, *M. Barresi, D. De Simone, R. Barzaghi, S. Castelli Dezza, L. Meraldi, D. Rosati, L. Piegari*, IEEE Journal of Emerging and Selected Topics in Industrial Electronics.

Jan.-2020 [J.3] **Windowed PWM: a Configurable Modulation Scheme for Modular Multilevel Converter Based Traction Drives**, *D. De Simone, L. Piegari, P. Tricoli, S. D'Arco*, IEEE Transactions on Power Electronics.

Dec.-2019 [J.2] **Integration of Stationary Batteries for Fast Charge EV Charging Stations**, *D. De Simone, L. Piegari*, Energies 2019, 12 (24), 4638.

Sept. 2019 [J.1] **Control strategy to improve EV range by exploiting hybrid storage units**, *S. Barcellona, D. De Simone, L. Piegari*, IET Electrical System in Transportation.

Peer-Reviewed Conference Proceedings

Nov.-2022 [C.11] **Use of Supercapacitors to Enhance the Lifetime and Efficiency of Road Vehicles Batteries**, *D. Del Giudice, D. De Simone and L. Piegari*, 2022 IEEE Vehicle Power and Propulsion Conference (VPPC).

July-2021 [C.10] **A Novel Approach for Distributed Maximum Power Point Tracking Using Modular Multilevel Converters**, *A. July, D. De Simone and L. Piegari*, 2021 IEEE 15th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG).

July-2020 [C.9] **Modular multilevel converters for battery electric vehicles: variable dc voltage control to optimize battery lifetime**, *D. De Simone and L. Piegari*, 2020 IEEE 14th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG), Setubal, Portugal.

June-2020 [C.8] **Optimization of MMC level number for battery integration in MV grid**, *M. Barresi, D. De Simone and L. Piegari*, 2020 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM), Sorrento, Italy.

Oct.-2019 [C.7] **A Hybrid Modular Multilevel Converter with Multiple Common-Mode Voltage Injection Control for Electric Vehicle Applications**, *D. Wang, L. Piegari, D. De Simone, J. Liu*, IEEE Applied Power Electronics Conference and Exposition (APEC), New Orleans, Louisiana.

Sept.-2019 [C.6] **Design and operation of a fail-operational 5kW 800V-12V DC-DC converter**, *F. Bertino, D. De Simone, L. Piegari*, 2019 21st European Conference on Power Electronics and Applications (EPE'19 ECCE Europe), Genova, Italy.

July 2019 [C.5] **A novel sliding mode controller for DC-DC Boost converters**, *A. Cervone, D. De Simone*, 7th International Conference on Clean Electrical Power (ICCEP), Otranto, Italy.

July 2019 [C.4] **Real-time Electric Vehicle Range Estimation Based on a Lithium-Ion Battery Model**, *S. Barcellona, D. De Simone, S. Grillo*, 7th International Conference on Clean Electrical Power (ICCEP), Otranto, Italy.

June 2019 [C.3] **A Battery Lifetime Improved Control Strategy of Modular Multilevel Converter for Electric Vehicle Application**, *D. Wang, J. Liu, X. Chen, L. Piegari, D. De Simone, S. Song*, IEEE 10th International Symposium on Power Electronics for Distributed Generation Systems, Xi'an, Shaanxi, China.

Sept. 2018 [C.2] **A Simple Control Strategy for a PV-Battery System**, *S. Barcellona, D. De Simone, L. Piegari*, 7th IET Renewable Power Generation (RPG) conference, Lyngby, Denmark.

June 2018 [C.1] **Comparative Analysis of Modulation Techniques for Modular Multilevel Converters in Traction Drives**, *D. De Simone, L. Piegari, S. D'Arco*, 2018 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM), Amalfi, Italia.

Activities in International Conferences

July 2023 **Participation in the Organizing Committee**, Otranto, Italy.
2023 International Conference on Clean Electrical Power (ICCEP)

July 2019 **Participation in the Organizing Committee**, Otranto, Italy.
2019 International Conference on Clean Electrical Power (ICCEP)

July 2019 **Conference Presentation**, Otranto, Italy.
Real-time Electric Vehicle Range Estimation Based on a Lithium-Ion Battery Model, 2019 International Conference on Clean Electrical Power (ICCEP)

June 2018 **Conference Presentation**, Amalfi, Italy.
Comparative Analysis of Modulation Techniques for Modular Multilevel Converters in Traction Drives, 2018 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM)

Languages

Native Italian

Fluent English

Computer skills

Advanced Matlab, Simulink, Texas Instrument's embedded coder, LaTeX, Microsoft Office, Arduino IDE, FDM 3D Printing

Intermediate Cura, Eagle, SolidWorks, Slic3r, LabView FPGA, C, Inkscape, SLA 3D Printing, Python

Basic Altium, Ansys Maxwell, Lightroom, LtSpice, Photoshop, Premiere

Certifications

2015 TOEIC, 900/990

Memberships

2014–current AVISMI Blood Donor

Interests and Hobbies

- Photography
- 3D printing
- Windsurfing
- Climbing

Friday 1st September, 2023

Autorizzo al trattamento dati ai sensi del GDPR 2016/679 del 27 aprile 2016 (Regolamento Europeo relativo alla protezione delle persone fisiche per quanto riguarda il trattamento dei dati personali). Autorizzo la pubblicazione del Curriculum Vitae sul sito istituzionale del Politecnico di Milano (sez. Amministrazione Trasparente) in ottemperanza al D. Lgs n. 33 del 14 marzo 2013 (e s.m.i.).