Armando Abrantes

Personal Data

Place and Date of Birth:	Sousa, Brazil | 21 September 1993
Professional Address:	Rua Aprígio Veloso, 882, 58429-900 Campina Grande, Paraíba, Brazil
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Research Interests

Grid Integration of Renewable Energy Sources, Parallel and Series Operation of Distributed Converters, AC and DC Micro-grids Modelling and Control, Energy Storage, Non-Linear Synchronization Phenomena of Coupled Oscillators, Low-Inertia Power Systems Stability Analysis, Non-Linear Dynamical Systems, Emergent Phenomena in Complex Systems, Social Technology.

Teaching Experience

Jan. 2022 Feb. 2020	Assistant Professor **Federal Center for Technological Education of Rio de Janeiro (CEFET-RJ)**, Rio de Janeiro, Brazil Department of Electrical Engineering

Education

(Current) Mar. 2021	Doctor of Sciences in Electrical Engineering **Federal University of Campina Grande (UFCG)**, Campina Grande, Brazil Research Theme: Grid-Forming Inverters as a Solution for Low-Inertia Power Grids Course CGPA: 9.0/10.0 Advisor: Profs. A. M. N. Lima and A. C. Oliveira
Feb. 2019 Mar. 2017	Master of Sciences in Electrical Engineering **Federal University of Rio de Janeiro (UFRJ)**, Rio de Janeiro, Brazil Thesis: "Digital One-Cycle Control Technique with Grid Voltage Measurement Applied to Three-Phase Power Factor Corrected Rectifiers and Active Power Filters". Course CGPA: 2.46/3.0 Advisors: Profs. L. G. B. Rolim and R. F. da S. Dias
Jun. 2014 Jul. 2013	Exchange Year in Electrical Engineering **Norwegian University of Science and Technology (NTNU)**, Trondheim, Norway Study Program in the Fields of Marine and Offshore Power Systems, High Voltage Equipment, Electric Drives and Renewable Energy
May 2017 Mar. 2010	Bachelor Degree in Electrical Engineering **Federal University of Campina Grande (UFCG)**, Campina Grande, Brazil Final Project: "Implementation of an Electric Drive System with Permanent Magnet Synchronous Motor with Speed and Position Estimation from Digital Hall Effect Sensors". Course CGPA: 7.53/10.0 Advisor: Prof. A. C. Oliveira

Technical Skills

Tools:	Matlab/Simulink, Python, PSIM, PSCAD/EMTDC, Altium Designer, Code Composer Studio
Prog. Languages:	C/C++, C#, Python, LaTeX
Hardware:	DSPs: Texas Instruments TMS320F28377S and TMS320F28379D, NXP MK22FN512
RT Simulation:	OPAL-RT 5600 and Typhoon HIL (Specialist Certification)

Research Experience

Current Feb. 2021	Laboratory of Industrial Electronics and Motor Drive - UFCG, Campina Grande, Brazil *Application of Power Electronics to Electric Grid* Research on What is decentralized control of grid-connected inverters with focus in Grid-Forming Inverter control design. The systems modelling, control systems design, HIL implementation are done with tools including: a DSP from Texas Instruments and OPAL-RT 5600. Advisors: Profs. R. F. da S. Dias and L. G. B. Rolim
Jan. 2021 Oct. 2017	Alternative Energy Sources Laboratory - Coppe/UFRJ, Rio de Janeiro, Brazil *Application of Power Electronics to Electric Grid* Research on Microgrids focused on applications of nonlinear and non-conventional control techniques to renewable energy sources integration, three-phase PFC Rectifier, Active Filter and Microgrid Voltage Support. The systems modelling, control systems design, real implementation on a DSP from Texas Instruments and recently from NXP Semiconductors. Advisors: Profs. R. F. da S. Dias and L. G. B. Rolim
Sep. 2017 Dec. 2016	Alternative Energy Sources Laboratory - Coppe/UFRJ, Rio de Janeiro, Brazil *Electric Drives and Microcontrollers* Development of an Electric Drive System with Permanent Magnet Synchronous Motor (PMSM) with Speed and Position Estimation from Digital Hall Effect Sensors. The systems modelling, control systems design, real implementation on a DSP from Texas Instruments were done with the use of tools Matlab/Simulink, PSIM and Code Composer Studio. Supervisor: Prof. L. G. B. Rolim
Aug. 2016 Sept. 2014 & Jun. 2013 Nov. 2012	Laboratory of Industrial Electronics and Motor Drive - UFCG, Campina Grande, Brazil *Active Filters and Electric Drives* Researches on Multilevel Converters applied to Active Current Filter and Electric Drives with Open-End Multiphase Induction and Permanent Magnet Synchronous Machines. The systems modelling, control systems design and simulations. were done with the use of tools Matlab/Simulink and PSIM. Advisor: Prof. C. B. Jacobina

Selected Publications

2023	A. J. G. Abrantes-Ferreira, A. C. Oliveira, A. M. N. Lima, "Dispatchable Virtual Oscillator Inverter: Fault Mitigation in Weak Grids". In: *IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, USA, Oct.-Nov. 2023. To appear
2022	A. J. G. Abrantes-Ferreira, A. C. Oliveira, A. M. N. Lima, "A Unified Control Framework for Grid-Forming Inverters". In: *Brazilian Congress on Automation (CBA)*, Fortaleza, Brazil, Oct. 2021. Link
2022	L. N. Gomes, A. J. G. Abrantes-Ferreira, R. F. S. Dias, L. G. B. Rolim, "Synchronverter-Based STATCOM With Voltage Imbalance Compensation Functionality," *IEEE Trans. Ind. Electron.*, v. 65, no. 5, pp. 4836-4844, May 2022. Link
2021	A. J. G. Abrantes-Ferreira, A. M. N. Lima, "Comparative Performance Analysis of Grid-Forming Strategies Applied to Disconnectable Microgrids". In: *IEEE Brazilian Power Electronics Conference (COBEP)*, João Pessoa, Brazil, Nov. 2021. Link
2020	S. L. S. Lima Barcelos, R. F. S. Dias, A. J. G. Abrantes-Ferreira, A. G. P. Alves, E. W. Watanabe, "Dynamic Direct Voltage Controller (D2VC) for grids with intermittent sources," *Electric Power Systems Research*, v. 182, p. 106225, 2020. Link
2019	A. J. G. Abrantes-Ferreira, L. N. Gomes, R. F. S. Dias and L. G. B. Rolim, "Deriving Stability Condition for One-Cycle Control with Triangular Carrier by Poincaré Maps". In: *Brazilian Power Electronics Conference and Southern Power Electronics Conference (COBEP/SPEC)*, Santos, Brazil, Dec. 2019. Link

Society Memberships

CIGRÉ, IEEE Power Electronics (PELS), Industry Applications (IAS) Power and Energy (PES) Societies, Brazilian Society of Automatics (SBA).

Languages

Portuguese:	Mothertongue
English:	Fluent
Spanish:	Intermediate Knowledge
French:	Elementary

Volunteer Work

Current Apr. 2016	Bike Teacher at Bike Anjo NGO - Campina Grande and Rio de Janeiro, Brazil I teach people to ride bikes and to get to know the cities from a (moving) point of view on a bike.
Dec. 2020 Mar. 2020	DSP Programmer at Ventilator of Exception for COVID-19 - UFRJ, Rio de Janeiro, Brazil Programming of NXP's DSP MK22FN512 for the control and operation of the Ventilator of Exception for COVID-19 - UFRJ (VExCO) Project led by the COPPE/UFRJ Biomedical Engineering Program and countless collaborators, which aimed to meet the urgent foreseen demand for these devices due to COVID-19.
Dec. 2019 Apr. 2019	Teacher at PreparaNEM, Rio de Janeiro, Brazil Support to students on Physics Subject of High School Level aiming to prepare them for the Brazilian National University Entrance Examination (ENEM).

Interests and Activities

Technology, Mathematics, Programming, Energy, Volunteer Work, Walking, Travelling, Percussion, Musical Improvisation, Learning Languages, Cooking, Eating.

References

Antonio M. N. Lima, D.Sc.
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Federal University of Rio de Janeiro, Rio de Janeiro, Brazil
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Robson F. da S. Dias, D.Sc.
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