



Sidelmo Magalhães Silva

Full Professor · Department of Electrical Engineering · Federal University of Minas Gerais (UFMG), Brazil

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PROFILE

Full Professor at DEE/UFMG, teaching undergraduate and graduate courses. Expertise in the design of static power converters, digital signal processing systems for converter control, and the analysis and mitigation of power quality problems. Current research on microgrids, grid-forming converters, energy storage, electric machine insulation monitoring and arc-flash suppression.

EDUCATION

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|-----------|---|
| 2017–2018 | Postdoctoral researcher — University of Wisconsin–Madison, USA (electric power microgrids) |
| 1999–2003 | Ph.D. in Electrical Engineering — UFMG · Analysis and implementation of a dynamic voltage restorer · Advisor: Braz J. Cardoso Filho · CAPES scholarship |
| 1998–1999 | M.Sc. in Electrical Engineering — UFMG · Study and design of a dynamic voltage restorer · Advisor: Braz J. Cardoso Filho · CAPES scholarship |
| 1993–1997 | B.Sc. in Electrical Engineering — UFMG · Class Gold Medal (Lúcio dos Santos Award) |

PROFESSIONAL EXPERIENCE

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| 2010–present | Federal University of Minas Gerais — Full Professor, full-time · Coordinator of the Undergraduate Teaching Laboratory of Electric Energy Conversion (since 2014) · Member of the DEE Department Board and of the School of Engineering Projects Council |
| 2006–2010 | Federal Center for Technological Education of Minas Gerais (CEFET-MG) — Associate Professor · Coordinator of the Electrical Engineering laboratories |
| 2004–2006 | HPE High Power Engineering Ltda. — Managing partner and Executive Director |
| 2001–2002 | ABB Schweiz, Turgi (Switzerland) — Visiting researcher in power quality equipment R&D (1.5–3.5 MVA) |

ONGOING PROJECTS

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| 2025– | Incident-energy elimination system for low-voltage industrial switchgear · VALE |
| 2023– | SIMOI — online insulation monitoring for low- and medium-voltage induction motors · Coordinator · Petrobras |
| 2021– | Distributed generation and microgrid laboratory (APQ-02561-18) · Coordinator · FAPEMIG |
| 2020– | Medium-voltage VFDs for the large loads of a Libra FPSO and cooperative control · Petrobras / ANP |
| 2018– | Active arc-flash suppression system (ANEEL Strategic R&D) · Petrobras |
| 2018– | Distributed energy resources and battery storage in isolated microgrids · Cosern |

AWARDS AND HONORS

2025	Best Paper, Student & Young Professional category — Brazilian Power Electronics Society (SOBRAEP)
2023	Petrobras Inventor Award
2022	Best Paper, Undergraduate category — Brazilian Conference on Automation
2021	Meritorious Paper Award — IEEE IAS Metals Industry Technical Committee; Best Paper, 16th Petrobras Electrical Engineering Meeting
2010	3rd place, 19th Science and Technology Award — Minas Gerais Society of Engineers
2001	Best Paper — 4th Brazilian Seminar on Power Quality
2008–2017	Honoree, patron or class sponsor of 13 graduating classes (UFMG and CEFET-MG)

SUPERVISION

Completed: 7 Ph.D. · 26 M.Sc. · 4 postdoctoral researchers · 56 B.Sc. final projects · 14 undergraduate research projects · 4 specialization theses. Ongoing: 6 Ph.D. (2 as co-supervisor), 1 M.Sc. and 2 postdoctoral researchers.

TEACHING (UFMG)

Current: Applications of Power Electronics in Electric Power Systems (graduate, since 2016) · Microgrids and Active Distribution Networks (since 2014). Previous: ENG002 Electric Drives (2010–2017) · EEE934A Voltage Variations and Fluctuations (2012–2015) · ELE028 Electric Circuits Laboratory I (2011–2013) · EEE883 Low-Voltage Static Converters (2011)

PATENTS AND SOFTWARE

1. SILVA, L. F. ; **SILVA, S.M.** . Método de mitigação de sobretensões transitórias e monitoramento de degradação dielétrica em sistemas elétricos. Invention patent (INPI, Brazil); filed Jun 26, 2026. [BR1020260162159]
2. RAMOS, M. L. ; OLIVEIRA, W. A. ; **SILVA, S.M.** ; MAIA, T. A. C. ; SILVEIRA, N. B. ; PIRES, I. A. ; GUEDES, A. S. ; MASI, A. J. ; CARDOSO FILHO, B. J. ; ABREU, L. F. . Software para monitoramento e previsão da degradação de falha de isolamento em motores de indução trifásicos equipados com sensor de corrente de alta sensibilidade. Software registration (INPI, Brazil); registered Jul 14, 2026. [BR512026005291-2]
3. AMARAL, F. V. ; **SILVA, S.M.** ; CARDOSO FILHO, B. J. ; CONCEICAO, C. A. ; FONTOURA, G. . Devices and Processes for Arc Suppression in Electrical Panels. US patent (USPTO); filed Apr 18, 2024; granted Jul 7, 2026. [US 12676473 B2]
4. FERREIRA, D. M. ; **SILVA, S.M.** ; BRANDAO, D. I. . Control process for low voltage microgrids with distributed communication. US patent application (USPTO); filed Sep 14, 2023. [US20230291229]
5. **SILVA, S.M.** ; AMARAL, F. V. ; CARDOSO FILHO, B. J. ; CONCEICAO, C. A. ; FONTOURA, G. . Processo para supressão de arcos em painéis elétricos e dispositivo. Invention patent (INPI, Brazil); filed Oct 7, 2022. [BR1020220203997]
6. **SILVA, S.M.** ; FERREIRA, D. M. ; BRANDAO, D. I. . Processo de controle para microrredes de baixa tensão com comunicação distribuída. Invention patent (INPI, Brazil); filed Mar 11, 2022. [BR10202200455]
7. GUEDES, A. S. ; **SILVA, S. M.** . Processos on-line para monitoramento, acompanhamento e indicação dos mecanismos de degradação do isolamento e proteção instantânea contra sobrecorrente de fuga à terra para motores de indução trifásicos. Invention patent (INPI, Brazil); filed Sep 1, 2017. [BR1020170188671]
8. CARDOSO FILHO, B. J. ; PIRES, I. A. ; **SILVA, S. M.** . Compensador em série de tensão. Invention patent (INPI, Brazil); filed Nov 10, 2011; granted Nov 24, 2020. [PI014110003215]
9. BRAGA, M. F. ; **SILVA, S. M.** . Disposição introduzida em dispositivo protetor de contadores para baixa e média tensão. Utility model (INPI, Brazil); filed Nov 24, 2008. [MU88028976]
10. CARDOSO FILHO, B. J. ; **SILVA, S. M.** ; ARRUDA, L. N. ; SILVA, S. R. . Phase-locked loop rápido para rastreamento de fase, frequência e amplitude de sinais monofásicos. Invention patent (INPI, Brazil); filed Nov 27, 2000; granted Sep 13, 2011. [PI0006469]

1. CALLEGARI, J. M. S. ; BRANDAO, D. I. ; OLIVEIRA, L. G. M. ; **SILVA, S.M.** ; CARDOSO FILHO, BRAZ DE J. . Advanced Microgrid: Containerized Development Platform. REVISTA ELETRÔNICA DE POTÊNCIA, v. 30, p. e202502, 2025. DOI: 10.18618/rep.e202502
2. ANTUNES, HÉLIO MARCOS ANDRÉ ; PIERO, RAMON RAVANI DEL ; **SILVA, SIDELMO MAGALHÃES** . Application of Repetitive Control to Grid-Forming Converters in Centralized AC Microgrids. Energies, v. 18, p. 3427, 2025. DOI: 10.3390/en18133427
3. ANTUNES, HELIO M. A. ; BRANDAO, DANILO I. ; BIAJO, VITOR H. M. ; OLIVEIRA, FELIPE S. ; **SILVA, SIDELMO M.** . Floating, Production, Storage, and Offloading Unit: A Contingency Operating Mode Using Variable Frequency Drives. IEEE Access, v. 1, p. 1-1, 2024. DOI: 10.1109/ACCESS.2024.3400686
4. LOBATO, G. I. C. ; KATTEL, M. B. E. ; MARCELO, F. L. ; **SILVA, S.M.** ; CARDOSO FILHO, B. J. . A novel topology of a non-isolated bidirectional multiphase single inductor DC-DC converter. International Journal of Circuit Theory and Applications, v. 1, p. 1, 2024. DOI: 10.1002/cta.4257
5. RAMOS, GABRIEL V. ; BRANDAO, DENER A. DE L. ; PARREIRAS, THIAGO M. ; **SILVA, SIDELMO M.** ; FILHO, BRAZ J. CARDOSO . A Zero Harmonic Distortion Grid-Forming Converter for Medium Voltage Islanded Microgrids. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, v. 1, p. 1-12, 2024. DOI: 10.1109/tia.2024.3462913
6. BIAJO, V. H. M. ; LOBATO, G. I. C. ; **SILVA, S.M.** . Switch-Level Interleaved Converter: Circuit Operation, Output Ripple and Circulating Current. REVISTA ELETRÔNICA DE POTÊNCIA, v. 29, p. e202454, 2024. DOI: 10.18618/REP.e202454
7. ANTUNES, HÉLIO MARCOS ANDRÉ ; BRANDAO, DANILO I. ; BIAJO, VITOR H. M. ; ALVES, MARCOS H. S. ; OLIVEIRA, FELIPE SILVA ; **SILVA, SIDELMO MAGALHAES** . Floating, Production, Storage, and Offloading Unit: A Case Study Using Variable Frequency Drives. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, v. 1, p. 1-9, 2023. DOI: 10.1109/TIA.2023.3258420
8. ROCHA, S. P. ; **SILVA, S.M.** ; EKEL, P. I. . Fuzzy set-based approach for grid integration and operation of ultra-fast charging electric buses. INTERNATIONAL JOURNAL OF ELECTRICAL POWER & ENERGY SYSTEMS, v. 138, p. 107919, 2022. DOI: 10.1016/j.ijepes.2021.107919
9. BARBOSA, R. ; ISSA, M. ; **SILVA, S.M.** ; ILINCA, A. . Variable Speed Diesel Electric Generators: Technologies, Benefits, Limitations, Impact on Greenhouse Gases Emissions and Fuel Efficiency. Journal of Energy and Power Technology, v. 4, p. 2-23, 2022.
10. FERREIRA, DANIELE ; **SILVA, SIDELMO** ; SILVA, WANER ; BRANDAO, DANILO ; BERGNA, GILBERT ; TEDESCHI, ELISABETTA . Overview of Consensus Protocol and Its Application to Microgrid Control. Energies, v. 15, p. 8536, 2022. DOI: 10.3390/en15228536
11. FERREIRA, R. V. ; **SILVA, S.M.** ; BRANDAO, D. I. . Positive-Negative Sequence Synchronverter for Unbalanced Voltage in AC Grids. JOURNAL OF CONTROL, AUTOMATION AND ELECTRICAL SYSTEMS, v. 1, p. 1-10, 2021. DOI: 10.1007/s40313-021-00690-4
12. FERREIRA, D. M. ; BRANDAO, D. I. ; BERGNA-DIAZ, G. ; TEDESCHI, E. ; **SILVA, S.M.** . Distributed Control Strategy for Low-Voltage Three-Phase Four-Wire Microgrids: Consensus Power-Based Control. IEEE Transactions on Smart Grid, v. 1, p. 1-17, 2021. DOI: 10.1109/tsg.2021.3065910
13. COSTA, D. A. ; TORRES, L. A. B. ; **SILVA, S.M.** ; CONTI, A. R. ; BRANDAO, D. I. . Parameter Selection for the Virtual Oscillator Control Applied to Microgrids. Energies, v. 14, p. 1-25, 2021. DOI: 10.3390/en14071818
14. AMARAL, FERNANDO ; **SILVA, SIDELMO** ; CONCEICAO, CLAUDIO ; FONTOURA, GUSTAVO ; INACIO, CLEBER ; CARDOSO, BRAZ . Assessment of Catastrophic Failure for Phase Control Thyristors in ac Pulsed Applications. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, v. 1, p. 1-1, 2021. DOI: 10.1109/tia.2021.3065896
15. ANTUNES, HÉLIO MARCOS ANDRÉ ; **SILVA, SIDELMO MAGALHÃES** ; BRANDAO, DANILO IGLESIAS ; MACHADO, ALYSSON AUGUSTO PEREIRA ; FERREIRA, REGINALDO VAGNER . A fault-tolerant grid-forming converter applied to AC microgrids. INTERNATIONAL JOURNAL OF ELECTRICAL POWER & ENERGY SYSTEMS, v. 121, p. 106072, 2020. DOI: 10.1016/j.ijepes.2020.106072
16. GUEDES, ARMANDO ; **SILVA, SIDELMO** . Insulation Failures Prognosis in Electric Machines: Preventive Detection and Time to Failure Forecast. IET Electric Power Applications, v. 14, p. 1108-1117, 2020. DOI: 10.1049/iet-epa.2019.0711
17. BRANDAO, DANILO IGLESIAS ; MENDES, FREDERICO ; FERREIRA, REGINALDO VAGNER ; **SILVA, SIDELMO MAGALHAES** ; PIRES, IGOR AMARIZ . ACTIVE AND REACTIVE POWER INJECTION STRATEGIES FOR THREE-PHASE FOUR-WIRE INVERTERS DURING SYMMETRICAL/ASYMMETRICAL VOLTAGE SAGS. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, v. 1, p. 1-1, 2019. DOI: 10.1109/TIA.2019.2893135

18. **SILVA, SIDELMO**; GUEDES, ARMANDO . Insulation Protection and Online Stress Agent Identification for Electric Machines using Artificial Intelligence. IET Electric Power Applications, v. 1, p. 1-11, 2019. DOI: 10.1049/iet-epa.2018.5198
19. ANTUNES, HELIO MARCOS ANDRE ; PIRES, IGOR AMARIZ ; **SILVA, SIDELMO MAGALHAES** . Evaluation of Series and Parallel Hybrid Filters Applied to Hot Strip Mills with Cycloconverters. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, v. 1, p. 1-1, 2019. DOI: 10.1109/tia.2019.2932966
20. FERREIRA, REGINALDO V. ; **SILVA, SIDELMO M.** ; ANTUNES, HÉLIO M. A. ; VENKATARAMANAN, GIRI . Dynamic Analysis of Grid-Connected Droop-Controlled Converters and Synchronverters. JOURNAL OF CONTROL, AUTOMATION AND ELECTRICAL SYSTEMS, v. 1, p. 1-13, 2019. DOI: 10.1007/s40313-019-00482-x
21. ANTUNES, HÉLIO MARCOS ANDRÉ ; **SILVA, SIDELMO MAGALHÃES** ; BRANDAO, DANILO IGLESIAS ; MACHADO, ALYSSON AUGUSTO PEREIRA ; FILHO, BRAZ DE JESUS CARDOSO . Harmonic Compensation Using a Series Hybrid Filter in a Centralized AC Microgrid. JOURNAL OF CONTROL, AUTOMATION AND ELECTRICAL SYSTEMS, v. 5, p. 1-11, 2018. DOI: 10.1007/s40313-017-0365-4
22. SILVEIRA, Sandro Élisson da ; **SILVA, S. M.** ; CARDOSO FILHO, Braz de J . Fault Ride-Through Enhancement in DFIG with Control of Stator Flux Using Minimized Series Voltage Compensator. IET Renewable Power Generation, v. 12, p. 1234-1240, 2018. DOI: 10.1049/iet-rpg.2017.0804
23. ANTUNES, H. M. A. ; **SILVA, S. M.** ; BRANDAO, D. I. ; MACHADO, A. A. P. ; CARDOSO FILHO, Braz de J . A new multifunctional converter based on a series compensator applied to AC microgrids. INTERNATIONAL JOURNAL OF ELECTRICAL POWER & ENERGY SYSTEMS, v. 102, p. 160-170, 2018. DOI: 10.1016/j.ijepes.2018.04.013
24. ANTUNES, H. M. A. ; **SILVA, S. M.** ; CARDOSO FILHO, Braz de J . Analysis and Operation of an Electric Power Micro-grid. ITEGAM- Journal of Engineering and Technology for Industrial Applications (ITEGAM-JETIA), v. 4, p. 1, 2018. DOI: 10.5935/2447-0228.20180042
25. BRANDAO, DANILO I. ; SIMÕES, MARCELO G. ; FARRET, FELIX A. ; ANTUNES, HÉLIO M. A. ; **SILVA, SIDELMO M.** . Distributed Generation Systems: An Approach in Instrumentation and Monitoring. ELECTRIC POWER COMPONENTS AND SYSTEMS, v. 46, p. 2189-2202, 2018. DOI: 10.1080/15325008.2018.1563954
26. MACHADO, A. A. P. ; ANTUNES, H. M. A. ; PIRES, I. A. ; **SILVA, S. M.** ; CARDOSO FILHO, BRAZ J. . Probabilistic Assessment and Evaluation of Transients in a Medium-Voltage Three-Phase Capacitor Bank Energized by Unsynchronized Vacuum Switchgears. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, v. 53, p. 918-928, 2017. DOI: 10.1109/tia.2016.2631137
27. PIRES, IGOR AMARIZ ; DE OLIVEIRA, FILIPE DIAS ; **SILVA, SIDELMO MAGALHAES** ; DE JESUS CARDOSO FILHO, BRAZ . On the Application of Single-Phase Voltage Sag Compensators in Three-Phase Systems. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, v. 53, p. 630-637, 2017. DOI: 10.1109/tia.2016.2603466
28. NAZARIO, V. ; GUIMARAES, F. G. ; **SILVA, S. M.** . Multi-objective energy storage power dispatching using plug-in vehicles in a smart-microgrid. Renewable Energy, v. 89, p. 730-742, 2016. DOI: 10.1016/j.renene.2015.11.084
29. GUEDES, Armando Souza ; **SILVA, SIDELMO MAGALHÃES** ; CARDOSO FILHO, Braz de Jesus ; CONCEIÇÃO, CLÁUDIO ALVARES . Evaluation of electrical insulation in three-phase induction motors and classification of failures using neural networks. Electric Power Systems Research (Print), v. 1, p. 1, 2016. DOI: 10.1016/j.epsr.2016.06.016
30. CHATTOPADHYAY, RITWIK ; BHATTACHARYA, SUBHASHISH ; FOUREAUX, NICOLE C. ; PIRES, IGOR A. ; PAULA, HELDER DE ; MORAES, LÊNIN ; CORTIZIO, PORFÍRIO C. ; **SILVA, SIDELMO M.** ; FILHO, BRAZ CARDOSO ; BRITO, JOSÉ A. DE S. . Low-Voltage PV Power Integration into Medium Voltage Grid Using High-Voltage SiC Devices. IEEE JOURNAL OF INDUSTRY APPLICATIONS (PRINT), v. 4, p. 767-775, 2015. DOI: 10.1541/ieejia.4.767
31. PIRES, IGOR AMARIZ ; **SILVA, SIDELMO M.** ; FILHO, BRAZ DE JESUS CARDOSO . Increasing Ride-Through Capability of Control Panels Using Square-Wave Series Voltage Compensator. IEEE Transactions on Industry Applications, v. 51, p. 1309-1316, 2015. DOI: 10.1109/tia.2014.2350080
32. PIRES, IGOR A. ; **SILVA, SIDELMO M.** ; AMARAL, FERNANDO V. ; CARDOSO FILHO, BRAZ J. . Protecting Control Panels Against Voltage Sags: Using a Square-Wave Series Voltage Compensator. IEEE Industry Applications Magazine, v. 20, p. 24-33, 2014. DOI: 10.1109/mias.2013.2288391
33. SANTOS, CLAUDIO H.G. ; FERREIRA, REGINALDO V. ; **SILVA, SIDELMO MAGALHAES** ; CARDOSO FILHO, BRAZ J. . Fourier-Based PLL Applied for Selective Harmonic Estimation in Electric Power Systems. J POWER ELECTRON, v. 13, p. 884-895, 2013. DOI: 10.6113/jpe.2013.13.5.884
34. OLIVEIRA, A. F. B. ; **SILVA, S. M.** ; SANTOS, C. H. G. ; CARDOSO FILHO, B. J. . Application Of A Repetitive Controller In A Single-phase Pwm Inverter With An Output Lc Filter Operating As A Programmable Ac Source. ELETRÔNICA DE POTÊNCIA (IMPRESSO), v. 18, p. 1161-1169, 2013. DOI: 10.18618/REP.2013.4.11611169

35. PIRES, I. A. ; CARDOSO FILHO, Braz de J ; **SILVA, S. M.** . Compensador Série de Tensão em Onda Quadrada para Mitigação de Afundamentos de Tensão. Controle & Automação (Impresso), v. 23, p. 164-178, 2012.
36. **SILVA, S. M.**; MARQUES, A. B. ; SATO, E. F. M. ; BRAGA, M. F. . Dispositivo para proteção de contadores contra afundamentos de tensão. ELETRICIDADE MODERNA, v. 39, p. 218-225, 2011.
37. FRANCA, G. J. ; SILVA, M. I. ; **SILVA, S. M.** . Operação dinâmica de bancos de capacitores com eliminação de correntes de inrush. O Setor Elétrico, v. 1, p. 90-95, 2010.
38. DAVILA FILHO, R. C. ; Marcelo Fonseca Braga ; **SILVA, S. M.** . Aplicação de filtros ativos e passivos de potência: estudo de caso. Eletricidade Moderna, v. 422, p. 288299, 2009.
39. LOPES, Bruno Marciano ; **SILVA, S. M.** ; CARDOSO FILHO, Braz de Jesus ; BRITO, José A S ; TRAVASSOS, Gustavo . Critical Analysis Of Low Voltage Static Series Compensators: Cost Versus Functionality. ELETRÔNICA DE POTÊNCIA (IMPRESSO), Ilha Solteira, SP, v. 11, n.1, p. 53-60, 2006. DOI: 10.18618/REP.2006.1.053060
40. **SILVA, S. M.**; SILVEIRA, Sandro Élisson da ; REIS, A. S. ; CARDOSO FILHO, B. J. . Analysis of a Dynamic Voltage Compensator With Reduced Switch-Count and Absence of Energy Storage System. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, New York, v. 41, n.7, p. 1255-1262, 2005. DOI: 10.1109/tia.2005.853382
41. **SILVA, S. M.**; CARDOSO FILHO, B. J. ; CARDOSO, M. M. G. ; BRAGA, M. R. . Blower Drive System based on Synchronous Motor with Solid Salient-Pole Rotor: Performance under Starting and Voltage Sag Conditions. IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, New York, USA, v. 39, n.5, p. 1429-1435, 2003.
42. **SILVA, S. M.**; CARDOSO FILHO, B. J. ; SILVA, Selênio Rocha ; RIBEIRO, T. N. . Análise e implementação de um restaurador dinâmico de tensão. Eletricidade Moderna, v. 44, p. 170-184, 2002.

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