

HUGO RODRIGUES DE BRITO

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ACADEMIC CREDENTIALS

Doctor of Philosophy Candidate in Electrical Engineering (2022 – Present)

Norwegian University of Science and Technology (NTNU), Trondheim, Trøndelag, Norway
Concentration: Power System Operation and Analysis
Supervisor: Kjetil Obstfelder Uhlen, Ph.D.

Master of Science in Electrical Engineering (2017 – 2019)

10.00 / 10.00

Federal University of Pará (UFPA), Belém, PA, Brazil

Concentration: Electric Power Systems

Thesis: “Analytical formulation for the assessment of active distribution networks considering the presence of step voltage regulators”

Supervisor: João Paulo Abreu Vieira, Ph.D.

Available at: repositorio.ufpa.br/jspui/handle/2011/12056

Bachelor of Science in Electrical Engineering (2011 – 2017)

9.23 / 10.00

Federal University of Pará (UFPA), Belém, PA, Brazil

Science without Borders (CsF) scholarship at University of Coimbra, Portugal (2012 – 2013)

Thesis: “The importance of time-domain simulations for the assessment of step voltage regulator runaway condition in distribution networks with distributed generation units”

Supervisor: João Paulo Abreu Vieira, Ph.D.

MAIN RESEARCH INTERESTS

- Modelling, simulation and analysis of transmission & distribution power systems
- Coordinated voltage control for long-term management of reactive power resources
- Impact of renewables-based generation on real-time power grid performance

PROFESSIONAL EXPERIENCE

R&D Project Co-Investigator (2022 – Present)

Norwegian University of Science and Technology (NTNU) in association with University of South-Eastern Norway (USN), Statnett, Statkraft, Skagerak Energi, Lede and AkerSolutions

Project: “System Optimization between power producer and grid owners (SysOpt)”

Duties: Investigations on coordinated and hierarchical voltage control techniques suitable for the characteristics of the Norwegian power grid. Developments are carried out via dynamic simulations in Python and formulation of a deterministic, multi-objective optimal power flow

Principal Investigator: Thomas Øyvang, Ph.D.

R&D Project Co-Investigator (2016 – 2019)

Federal University of Pará (UFPA) in association with Brazilian Electricity Regulatory Agency (ANEEL), Equatorial Energia Utility Company and ITB Electrical Equipment Co., Ltd.

Project: “Method of detection and protection against reverse power tap changer runaway condition of step voltage regulator (SVR) banks located at active distribution networks”

Duties: Knowledge-based analysis and decision support of SVR operation and control modes

Principal Investigator: João Paulo Abreu Vieira, Ph.D.

Undergraduate Project Researcher (2016 – 2017)

Federal University of Pará (UFPA) and Brazilian Council for Sci-Tech Development (CNPq)

Project: “Coordinated voltage control of distribution systems with distributed generation (DG)”

Duties: Investigating the adverse effects of DG interconnection on voltage regulation devices

Project Manager: João Paulo Abreu Vieira, Ph.D.

Intern at Signal Processing Laboratory (2011 – 2012)

Federal University of Pará (UFPA) in association with Amazon Foundation for Studies and Research Support of Pará (FAPESPA)

Duties: Designer and programmer of sensors and embedded systems using VHDL language

Supervisor: Aldebaro Barreto da Rocha Klautau Júnior, Ph.D.

TEACHING EXPERIENCE

Teaching Assistant (2022 – 2025)

Norwegian University of Science and Technology (NTNU)

Course: “TET4180 – Power System Dynamics and Control”

Duties: Preparing, solving, and grading exercises and exams; individual in-class assistance.

Course Coordinator: Kjetil Obstfelder Uhlen, Ph.D.

Scientific Assistant (2023 – 2024)

Norwegian University of Science and Technology (NTNU)

Course: “TET4100 – Circuit Analysis”

Duties: Preparing and solving exercises; individual in-class assistance.

Course Coordinator: Gilbert Joseph Bergna Diaz, Ph.D.

REVIEWER EXPERIENCE

Conference Manuscript Reviewer (2024 – Present)

- International Conference on Smart Energy Systems and Technologies (SEST)
- Innovative Smart Grid Technologies Latin America (ISGT LATAM)

Journal Manuscript Reviewer (2023 – Present)

- IEEE Transactions on Energy Conversion

PROFESSIONAL SKILLS

- Experience with Python programming for power system modelling and simulation
- Experience with Power System Simulator for Engineering (PSS®E) programming
- Advanced user of Microsoft Office tools (Word, PowerPoint, Excel and Visio)
- Intermediate user of Matrix Laboratory (MATLAB) software
- Intermediate user of Open Distribution System Simulator (OpenDSS) software
- Familiarity with SEL-5702 SynchroWave Operations (SWO) software
- Familiarity with C and VHDL programming languages
- Familiarity with optimization techniques applied to power systems analysis
- Familiarity with control, installation and operation of voltage regulation devices
- Willingness to work independently or in a team, and to learn any foreign language

LANGUAGES

- Portuguese: Native language
- English: Advanced (CEFR level C1)
111/120 score in TOEFL iBT: Reading 30, Listening 30, Speaking 23, Writing 28
Grade A in FCE exam – University of Cambridge, UK
- Italian: Upper Intermediate (CEFR level B2)
79/100 score in CILS exam – University for Foreigners of Siena, Italy
- French: Intermediate (CEFR level B1)
- Norwegian Bokmål: Basic (CEFR level A2)

CONFERENCES

CIGRÉ Nordic Regional Council Symposium, Trondheim, Norway, 2025. Accepted Paper: “Optimal and Coordinated Voltage Control: Case Study on a 132 kV Norwegian Grid Subsystem”. Role: Oral Presenter.

7th International Conference on Smart Energy Systems and Technologies (SEST), Turin, Italy, 2024. Accepted Paper: “Impact of Secondary Voltage Regulation Dynamics on Transmission-Level Voltage Stability”. Role: Oral Presenter.

6th International Conference on Smart Energy Systems and Technologies (SEST), Muğla, Turkey, 2023. Accepted Paper: “Investigations on Secondary Voltage Control for Long-Term Reactive Power Management”. Role: Oral Presenter.

21st EERA DeepWind Conference, Trondheim, Norway, 2023. Role: Organizing Committee.

XXV National Seminar on Electric Power Production and Transmission (SNPTEE), Belo Horizonte, Brazil, 2019. Accepted Paper: “Effects of distributed generation on the bidirectional operation of cascaded step voltage regulators: case study of a real 34.5 kV distribution feeder”. Role: Oral Presenter.

XVIII Ibero-American Regional Meeting of CIGRÉ (ERIAC), Foz do Iguaçu, Brazil, 2019. Accepted Paper: “Comparison between conventional load flow, QSTS simulation, and dynamic simulation to assess the operation of step voltage regulators in active distribution networks”. Role: Participant.

13th IEEE International Conference on Industry Applications (INDUSCON), São Paulo, Brazil, 2018. Accepted Paper: “Impact of distributed generation on distribution systems with cascaded bidirectional step voltage regulators”. Role: Poster Presenter.

VII Brazilian Symposium on Power Systems (SBSE), Niterói, Brazil, 2018. Accepted Paper: “QSTS simulation of reverse power tap changer runaway condition in active distribution networks”. Role: Oral Presenter.

XXVIII Undergraduate Research Seminar of the Federal University of Pará, Belém, Brazil, 2017. Accepted Presentation: “Coordinated voltage control of distribution networks with distributed generators”. Role: Oral Presenter.

JOURNAL PUBLICATIONS

V. M. Souza, **H. R. Brito**, K. O. Uhlen, “Comparative Analysis of Online Voltage Stability Indices Based on Synchronized PMU Measurements”, in *Sustainable Energy, Grids and Networks (SEGAN)*, vol. 40, December 2024.
DOI: 10.1016/J.SEGAN.2024.101544

V. M. Souza, J. P. A. Vieira, **H. R. Brito**, “Mitigating the impact of high-capacity dispatchable distributed generation on reconfigurable distribution networks with step voltage regulators: A real case study on voltage issues”, in *Electric Power Systems Research*, vol. 207, June 2022.
DOI: 10.1016/J.EPSR.2022.107842

CONFERENCE PUBLICATIONS

H. R. Brito, D. S. Baltensperger, K. O. Uhlen, “Optimal and Coordinated Voltage Control: Case Study on a 132 kV Norwegian Grid Subsystem”, in *CIGRÉ Nordic Regional Council Symposium*, Trondheim, Norway, 2025.
DOI: 10.48550/arXiv.2502.10220

H. R. Brito, V. M. Souza, K. O. Uhlen, “Impact of Secondary Voltage Regulation Dynamics on Transmission-Level Voltage Stability”, in *7th International Conference on Smart Energy Systems and Technologies (SEST)*, Turin, Italy, 2024.
DOI: 10.1109/SEST61601.2024.10694346

V. M. Souza, **H. R. Brito**, K. O. Uhlen, "Performance Assessment of Voltage Stability Indices for Real-Time Power Margin Estimation", in *7th International Conference on Smart Energy Systems and Technologies (SEST)*, Turin, Italy, 2024.

DOI: 10.1109/SEST61601.2024.10694352

H. R. Brito, V. M. Souza, K. O. Uhlen, "Investigations on Secondary Voltage Control for Long-Term Reactive Power Management", in *6th International Conference on Smart Energy Systems and Technologies (SEST)*, Muğla, Turkey, 2023.

DOI: 10.1109/SEST57387.2023.10257330

V. M. Souza, **H. R. Brito**, K. O. Uhlen, "Comparison of Voltage Stability Indices Based on Synchronized PMU Measurements", in *6th International Conference on Smart Energy Systems and Technologies (SEST)*, Muğla, Turkey, 2023.

DOI: 10.1109/SEST57387.2023.10257545

H. R. Brito, V. M. Souza, J. P. A. Vieira, M. E. L. Tostes, U. H. Bezerra, V. C. Souza, D. C. Pinheiro, H. A. Barata, H. N. S. Cardoso, M. S. Costa, "Effects of distributed generation on the bidirectional operation of cascaded step voltage regulators: case study of a real 34.5 kV distribution feeder", in *XXV National Seminar on Electric Power Production and Transmission (SNPTEE)*, Belo Horizonte, Brazil, 2019.

DOI: 10.48550/arXiv.2310.09074

V. M. Souza, **H. R. Brito**, J. P. A. Vieira, M. E. L. Tostes, U. H. Bezerra, H. N. S. Cardoso, M. S. Costa, "Comparison between conventional load flow, QSTS simulation, and dynamic simulation to assess the operation of step voltage regulators in active distribution networks", in *XVIII Ibero-American Regional Meeting of CIGRÉ (ERAC)*, Foz do Iguaçu, Brazil, 2019.

DOI: 10.48550/arXiv.2310.09054

H. R. Brito, V. M. Souza, V. C. Souza, J. P. A. Vieira, U. H. Bezerra, M. E. L. Tostes, A. O. R. Garcia, M. S. Costa, G. T. Carrera, H. N. S. Cardoso, "Impact of distributed generation on distribution systems with cascaded bidirectional step voltage regulators", in *13th IEEE International Conference on Industry Applications (INDUSCON)*, São Paulo, Brazil, 2018.

DOI: 10.1109/INDUSCON.2018.8627230

V. M. Souza, **H. R. Brito**, J. P. A. Vieira, "QSTS simulation of reverse power tap changer runaway condition in active distribution networks", in *VII Brazilian Symposium on Power Systems (SBSE)*, Niterói, Brazil, 2018.

DOI: 10.1109/SBSE.2018.8395574

AWARDS

- "Top 7 Presentation Award", for oral presentation in SEST 2024.

PATENTS

M. E. L. Tostes, U. H. Bezerra, J. P. A. Vieira, H. N. S. Cardoso, D. C. Pinheiro, V. C. Souza, H. A. Barata, **H. R. Brito**, M. N. B. F. Marinho, V. M. Souza, T. M. Wanzeler, “Inhibitor of step voltage regulator reverse power tap changer runaway condition”. Brazilian patent number BR512019001562-2, filed July 27, 2017, and issued July 30, 2019.