Rodney Itiki

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Updated on Oct 1, 2024.

EDUCATION

Ph.D. in Electrical Engineering, at the University of North Carolina at Charlotte with emphasis on Power Systems (Methods for Spatiotemporal Power Profile from Marine Hydro-Kinetic Energy, and Wind Energy from a Proposed U.S.-Caribbean-South America Super Grid under Hurricanes), 2018 – 2023.

Master of Science in Electrical Engineering (Power System), at University of São Paulo, Brazil, 2016 – 2017.

Postgrad Specialization Course on Project Management with emphasis on Engineering, Getulio Vargas Foundation, 432 hours, Sao Paulo, Brazil, 2007 – 2008.

Bachelor in Accounting at the University of Sao Paulo, Brazil, 1996 – 2003.

Bachelor in Electrical Engineering with emphasis on Electrical Energy and Automation, at the Polytechnic School of University of São Paulo, Brazil, 1991 – 1995. (TOP 1 university in Brazil, TOP 14 BRICS).

Entrance Exam Preparatory Course, Anglo Tamandare, Sao Paulo, Brazil, 1989 - 1990.

High School at Colegio Meninopolis (Catholic school), Sao Paulo, Brazil, 1987 - 1989.

EXPERIENCE

- **Oct 2, 2023 – present: Postdoc Research Associate at Oak Ridge National Laboratory (DOE's National Laboratory)**

Activities

Research and Development on Renewables, Energy Storage, and Grid Integration, including Electromagnetic Transients (EMT), differential and algebraic equations, components EMT modeling, numerical methods, and Pumped storage hydro (PSH), North America grid resilience, wind, solar PV, and hurricanes, MatLab, C++, offshore power systems, Super Grids, High Voltage (HVDC).

Journal paper (1)

Rodney Itiki (*), Nils Stenvig, Teja Kuruganti, and Silvio Giuseppe Di Santo. 2024. "Method for Spatiotemporal Solar Power Profile Estimation for a Proposed U.S.–Caribbean–South America Super Grid under Hurricanes" Energies 17, no. 7: 1545. https://doi.org/10.3390/en17071545

- **2018 – May 2023: Teaching and Research Assistant of Power System Eng. at the University of North Carolina at Charlotte**

Activities

Assistance to undergraduate students in completing the design and assembly of electronic printed circuit boards using cad software Eagle, and evaluation of their performance in the assignments.
Development of computer models in MatLab for simulation of power systems with offshore wind turbines, marine hydrokinetic turbines, microgrids, and super grids. Teaching assistant of: Electrical Energy Conversion, Electromagnetic & Electronic Devices Lab, ECE Junior Design (Eagle software for Printed Circuit Board PCB Design), System Analysis II (Laplace, root locus, stability), and Introduction to Machine Learning (Python, PyTorch).

Journal papers (8)

Rodney Itiki (*), Madhav Manjrekar, and Silvio Giuseppe Di Santo. 2024. "Proposed Extension of the U.S.–Caribbean Super Grid to South America for Resilience during Hurricanes" Energies 17, no. 1: 233. https://doi.org/10.3390/en17010233

Rodney Itiki (*), Madhav Manjrekar, Silvio Giuseppe Di Santo, Cinthia Itiki, Method for spatiotemporal wind power generation profile under hurricanes: a U.S.-Caribbean super grid proposition, *Renewable and Sustainable Energy Reviews*, https://doi.org/10.1016/j.rser.2022.113082

Rodney Itiki (*) et al., A proposed wide-area stabilization system through a large-scale fleet of electric vehicles for grid, *Int. Journ. Electrical Power and Energy Systems (IJEPES)*, https://doi.org/10.1016/j.ijepes.2022.108164

Rodney Itiki (*), Madhav Manjrekar, Silvio G.D. Santo, Luis F.M. Machado, Technical feasibility of Japan-Taiwan-Philippines HVdc interconnector to the Asia Pacific Super Grid, *Renewable and Sustainable Energy Reviews*, https://doi.org/10.1016/j.rser.2020.110161

Rodney Itiki (*), Silvio G.D. Santo, Cinthia Itiki, Madhav Manjrekar, Badrul Chowdhury, A comprehensive review and proposed architecture for offshore power system, International Journal of Electrical Power and Energy Systems (IJEPES), https://doi.org/10.1016/j.ijepes.2019.04.008

Rodney Itiki (*), Prithwiraj R. Chowdhury, Fast deployment of **COVID-19** disinfectant from common ethanol of gas stations in Brazil, *Health Policy and Technology*, https://doi.org/10.1016/j.hlpt.2020.07.002.

L. F. M. Machado, S. G. D. Santo, G. M. Junior, **R. Itiki** and M. D. Manjrekar, "Multi-Source Distributed Energy Resources Management System Based on Pattern Search Optimal Solution Using Nonlinearized Power Flow Constraints," in IEEE Access, vol. 9, pp. 30374-30385, doi: https://doi.org/10.1109/ACCESS.2021.3060336.

Rodney Itiki (*), S.G.D. Santo, E.C.M. Costa, R.M. Monaro, Methodology for mapping operational zones of VSC-HVDC transmission system on offshore ports, *International Journal of Electrical Power & Energy Systems*, Volume 93, pp. 266-275. DOI: https://doi.org/10.1016/j.ijepes.2017.05.034

IEEE Conference papers (4)

Rodney Itiki (*), P. Roy Chowdhury, F. Kamal, B. Chowdhury, M. Manjrekar, G. Bonner, "Method for Estimation of Marine Hydro-Kinetic Power based on High-frequency Radar Data", *Oceans 2021*, San Diego. DOI: https://doi.org/10.23919/OCEANS44145.2021.9705675

Rodney Itiki (*), M. Manjrekar, Silvio G. D. Santo, "Comparative Evaluation of Super Grid Topologies proposed for Europe and Latin America", In Proc. *51st North America Power Symposium*, KS, USA, DOI: https://doi.org/10.1109/NAPS46351.2019.9000193

Rodney Itiki (*), Madhav Manjrekar, Silvio Giuseppe Di Santo, "Topology Design Method for Super Grids based on experiences in China and North America", In Proc. *11th Conference on Innovative Smart Grid Technologies*, Washington DC, https://doi.org/10.1109/ISGT45199.2020.9087768 .

Luis F.M. Machado (*), S.G.D. Santo, K.G.D. Santo, A.L.V. Gimenes, M.M.Udaeta, Rodney Itiki, Madhav Manjrekar, "Technical-Economical Probabilistic Analysis of a Multi-Source System, In Proc. *IEEE PES T&D*, Chicago, IL. DOI: https://doi.org/10.1109/TD39804.2020.9300021

Symposium posters (4)

Rodney Itiki (*), Madhav Manjrekar, Badrul Chowdhury, Green **Hydrogen** and Oxygen for electrification of ferry boats, sustainability of local business, water treatment and oxygenation in North Carolina Coast, NC Renewable Ocean Energy Symposium, NCROEP CSI, Wanchese.
https://www.coastalstudiesinstitute.org/wp-content/uploads/2022/05/Rodney-Itiki-NCROEP-2022-Student-Poster-UNCC-Rev-03.pdf

Rodney Itiki (*),, K. Singh, F. Kamal, B. Chowdhury, M. Manjrekar, “Offshore Microgrid platform for Marine Hydrokinetic Energy and **Hydrogen** production in North Carolina”, International Conference on Ocean Energy (ICOE) meeting, Washington DC, https://www.eventscribe.com/2021/ICOE/fsPopup.asp?efp=REJFWktDQUQxNDE0MA&PosterID=342057&rnd=0.7708328&mode=posterinfo

Rodney Itiki (*),, Madhav Manjrekar, Badrul Chowdhury, Estimation of Power Generation Profile of Offshore MHK Microgrid Cluster, NC Renewable Ocean Energy Symposium, NCROEP CSI, Wanchese, https://www.coastalstudiesinstitute.org/wp-content/uploads/2021/05/Poster-Rodney-Itiki-UNC-Charlotte-2021-Rev-02.pdf

Faria Kamal, **Rodney Itiki**, Chandra Sekhar Goli, Sumedh Halbe, M. Manjrekar, B. H. Chowdhury, Hybrid High Voltage AC/DC System Protection and Controls For Interfacing Off-shore MHK Power Generation With On-shore Grid, North Carolina Coast, NC Renewable Ocean Energy Symposium, NCROEP CSI, Wanchese.

- **2016 – 2018: Research assistant of Electric Power System Engineering at the University of São Paulo USP, Brazil**

Activity

Development of computer models in PSCAD for simulation of electric power plants in maritime platforms, and research thesis writing.

- **2000 - 2015 Electrical Engineer VI with CNEC WorleyParsons, Brazil**

Design of power generation and distribution system in medium voltage (up to 18 kV), low voltage (up to 480Vac and 125Vdc), single line diagrams in Autocad or Microstation, three-line diagrams, diagrams for interconnection of measurement, control, and protection panels, cable sizing, cable list, substation electrical room layout. Assessment of existing field conditions, engineering documents search, and as-built survey. Supervision of electrical designers for schematic diagrams, cable tray layout, grounding and lightning protection plant, lighting plant, electrical material takeoff, and cable cut schedule. I was a specialist in charge of power system studies (simulation of short circuit, load flow, motor starting, battery sizing, capacitor bank sizing, harmonics studies, protection coordination, relay settings in PTW of SKM). For my protection coordination studies, I have some brief experience with digital relays from SEL, ABB (REF), Siemens (7SJ), and GE Multilin. I wrote technical specifications of step-up transformers, generator circuit-breakers, HV substation, stepdown transformers, 13.8kV, 4.16kV and 480V switchgear, 480Vac motor control centers, LV switchboards for 220Va/110Vac, and the HV switchyard and substation package, and scope of work statement. I prepared drawings of the hazardous area classification plan. I prepared a Technical Bid Evaluation of MV and LV electrical equipment and evaluated and made comments on vendors' documents. I provided technical assistance to field assembly and construction. I provided training and supervision of junior engineers and designers. I performed quality control of engineering documents produced by the designers. I elaborated proposals for engineering services with workforce estimates and expected delivery time/cost. I conducted remote technical assistance to the field assembly and construction. I was also in charge of collecting relevant data from mechanical, civil, piping, process engineering, and standards of the client for the electrical design of the EPC project. Reason for leaving the company: Layoff due to sharp drop in oil prices, and economic recession in Oil & Gas sector in Brazil.

Engineering Design Projects

Statoil Peregrinno Fixed Offshore Platform (4x8000 kW) - LONDON WorleyParsons Office - conceptual and Front End Engineering Design (FEED) during eight months. (Short circuit, load flow, and harmonics studies)
Statoil Peregrinno Fixed Offshore Platform A & B (3 x 3000 kW + 500kW revamp), Front End Loading (FEL3) design.
Petrobras Piratininga combined cycle power plant (616 MW) in São Paulo, Brazil. 5 months in Houston, TX (USA) at Parsons Energy and Chemical Group.
Petrobras Baixada Fluminense Combined Cycle Power Plant (2x214 MVA+230 MVA). (Short circuit, load flow, and coordination and selectivity of protection devices studies)
Petrobras Offsite of Diesel Additive Blending Project of RPBC refinery (2x750 kVA).
Petrobras Hydrodessulfurization/Diethanolamine and Hydrotreatment of Naphta Unit of RPBC refinery (15 MVA).
Petrobras FEED Hydrogen generation and Diesel treatment Unit, Henrique Lage Refinery.
Petrobras FEED Liquefied Petroleum Gas Treatment Unit, Cacimbas and Mexilhão.
Petrobras Combined cycle power plant on Cubatão (300 MVA), and Termoaçu (320 MW). (Short circuit, load flow, and relay coordination and selectivity of protection devices studies)
Light Nilo Peçanha Hydropower Plant (400 MVA) modernization Brazil, Alcoa Juruti Bauxite Mining Facility in Pará, Brazil. Electrical design engineer

- **1996 - 2000 Electrical Engineer with Frontenge Engenharia Ltda, Brazil**

Engineering Design Projects

CBPI Oil Company – Design of Gasoline storage and distribution base.,
BASF Chemical - Design of electrical power distribution system of chemical facilities

SPECIFIC TECHNICAL EXPERTISE/SPECIALIST COURSES

- PTW SKM and ETAP (for power system simulation in engineering companies)
- PSCAD, and PSSE/SINCAL from Siemens (electrical power simulation in academia and research)
- AutoCAD / MicroStation (for 2D drawing of diagrams, substation layout, power distribution plants)
- EAGLE (design of printed circuit boards for research or power electronic industry)
- MATLAB script (95%), C++ (3%) and Python (2%) (for research coding)

- VISIO (for figures in articles) and MS OFFICE (Excel, Word, Access, Power Point).

LANGUAGES: English (very good), Portuguese (fluent 100%), Spanish (30%), Japanese (2%)

PEER REVIEWER:

- Renewable and Sustainable Energy Reviews (>87)
- IEEE Transactions on Sustainable Energy (6)
- Electronics (11)
- Energies (11)
- Journal of Marine Science and Engineering (4)
- AIMS Energy (3)
- Applied Sciences (2)
- Clean Technologies (1)

RESEARCH REFERENCES IN LABORATORIES:

- **Nils M Stenvig (MSc)**
  Group Leader – Energy Systems Integration - Oak Ridge National Laboratory
  Phone: +1 865.241.9222, email: stenvignm@ornl.gov
- **Dr. Madhu Sudhan Chinthavali**
  Section Head, Energy Systems Integration – Oak Ridge National Laboratory
  Phone: +1 865-341-1411, chinthavalim@ornl.gov