Gabriel dos Santos

Contacts: +55 (21) 97993-8833

e-mails: gabriel.santos@eng.uerj.br

LinkedIn: https://www.linkedin.com/in/gabriel-d-394b958a/

Presentation

Professor in Electrical Engineering with knowledge in Multiphysics simulations as electromagnetic, thermal simulations using Finite Element Software (COMSOL Multiphysics, Ansys). Knowledge in synchronous and induction machines, air-core/ferromagnetic reactors, power transformers, resistive and inductive superconducting and non-superconducting fault current limiters including their coupling to the electrical power system. Moreover, I have knowledge of High-Temperature Superconductor (HTS) devices simulations and developments and their impacts on the power grid. Actually, I am a professor with fixed position at State University of Rio de Janeiro and a Scientific Researcher at LAFAE laboratory I work with HTS system simulations with electromagnetic, thermal and mechanical systems, power systems simulations and high voltage cables simulations.

Education

- Federal University Fluminense – Doctoral degree, Electrical Engineering (2021-2023).
- Federal University Fluminense – Master Degree, Electrical Engineering (2019-2021)
- Federal University of Rio de Janeiro- Bachelor Degree, Electrical Engineering (2013-2019)

Professional experience

Professor

Company Name State University of Rio de Janeiro

Dates Employed Jun 2022 – Present

Location RJ, Rio de Janeiro

Responsible to teach class about the follow subjects:

-Electrical circuit theory and laboratory

-Electrical Machine theory and laboratory

-Electrical specification of components theory

Scientific Researcher

Company Name LAFAE

Dates Employed Nov 2022 – Present

Location RJ, Rio de Janeiro

-Power Systems Simulation: Power Flow, Short-Circuit, Electromechanical and Electromagnetic transients

-Analysis of renewable sources connection to the Electrical grid of Brazil

-Finite Element Analysis: High Voltage AC and DC cables

Electrical Engineer

Company Name Voltalia Brazil

Dates Employed Apr 2022 – Nov-2022

Location RJ, Rio de Janeiro

-Electromagnetic Transient Analysis considering several substations layouts.
-Power flow analysis
-Short-Circuit analysis
-Electrotechnical Transient analysis
- Experience in dealings with partners for development of "informação e parecer de acesso" and "projeto básico".
- Experience in ONS requirements for electrical studies.
- Participating in winding and solar power plant projects rated 500kV-230kV and 100MVA-500MVA.

Product Engineer

Company Name Emicol Eletroeletronico

Dates Employed Set 2021 – Apr 2022

Location São Paulo, Itu

Simulations and optimizations of PMSM and solenoids using Ansys Maxwel software. Programming in Python to design the PMSM.

Scientific Researcher

Company Name Laboratório Núcleo de Inovação Tecnológica de Engenharia Elétrica (NITEE) Full-time

Dates Employed Feb 2019 – Present

Location Rio de Janeiro Area, Brazil

I participated in the P&D Light Project 2020/2022
-Participation in the design of the power electronics series switch fault current limiter(SS-FCL).

-Transient electromagnetic analysis in the power grid due to the SS-FCL insertion
-Electromagnetic and thermal Simulation using COMSOL of the Air Core Reactor Project,
-Electrical Equipment Projects using finite element method.

I participated in the P&D Light Project 2018/2019
- Simulation of resistive fault current limiter using the thermoelectric model developed in MATLAB and ATPdraw.
-Simulation and development of the Resistive Short-Circuit Fault Current Limiter at laboratory
-Experiments of resistive fault current limiter at CEPEL Andrianópolis Laboratory.

Languages

- Portuguese – Mother Tongue
- English – Write, Read and Speak
- Spanish – Write, Read and Speak

Publications

J-A Approach to Simulations of HTS Tapes: How to Couple with Electric Circuits

Vertical and Horizontal Force Measurements of a Double Crossed Loop

Use of the J-A Approach to Model Homogenized 2G Tape Stacks and HTS Bulks | IEEE Journals & Magazine | IEEE Xplore

Fast Coupled Thermoelectric and Magnetic Model to Simulate the Transient Behavior of Inductive and Resistive Superconducting Fault-Current Limiters | IEEE Journals & Magazine | IEEE Xplore

FEM-circuit co-simulation of superconducting synchronous wind generators connected to a dc network - Archive ouverte HAL

Magnetic bearings with double crossed loops modelled with T-A formulation and electric circuits - ScienceDirect

Analysis and experimental tests of a solid-state fault current limiter | Electrical Engineering (springer.com)

J-A formulation: A finite element methodology for simulating superconducting devices - ScienceDirect

Optimization Design of a Saturated Iron Core Fault Current Limiter Using a GA and PSO Algorithms Coupled With Finite Element Method | IEEE Journals & Magazine | IEEE Xplore

Coupling electromagnetic numerical models of HTS coils to electrical circuits: multi-scale and homogeneous methodologies using the T-A formulation - IOPscience

A review of superconducting fault current limiters compared with other proven technologies - ScienceDirect

2-D Modeling of HTS Coils With --- Formulation: How to Handle Different Coupling Scenarios | IEEE Journals & Magazine | IEEE Xplore

A 3-D Finite-Element Method Approach for Analyzing Different Short Circuit Types in a Saturated Iron Core Fault Current Limiter | IEEE Journals & Magazine | IEEE Xplore

An Integrated Methodology to Assess AC Losses in the kHz Range Using the FEM and Partial Element Equivalent Circuit | IEEE Journals & Magazine | IEEE Xplore

Fundamentals, topologies and optimization methods of saturated iron core fault current limiter (srce.hr)

HTS Coated conductor losses model using the coupling method and the T-A formulation - Archive ouverte HAL

A novel method to simulate coupled 3D FEM with circuit applied to SIC-SFCL - Archive ouverte HAL

Materials | Free Full-Text | Essential Material Knowledge and Recent Model Developments for REBCO-Coated Conductors in Electric Power Systems (mdpi.com)

A coupling method of the superconducting devices modeled by finite element method with the lumped parameters electrical circuit - IOPscience

Multi-objective optimization for the superconducting bias coil of a saturated iron core fault current limiter using the T-A formulation - IOPscience

Tests and recovery under load simulations of a novel bifilar resistive SFCL having undulated shape configuration - IOPscience

A model for calculating losses in transformer related to orders and harmonic amplitude under analysis of joule effect, eddy current and hysteresis (degruyter.com)

A Novel Configuration for Resistive SFCL with bifilar 2G tapes - IOPscience

Simulation of a Superconductor Fault Current Limiter with finite element method using A-V-H formulation | Simpósio Brasileiro de Sistemas Elétricos - SBSE (sba.org.br)

Emulation and experimental analysis of an axial superconductor magnetic bearing - IOPscience

Award

- Academic Excellence Award: Best dissertation in the area of exact sciences in postgraduate programs at Universidade Federal Fluminense.
- Academic Excellence Award: Best dissertation in postgraduate program of electrical and telecommunication engineering at Universidade Federal Fluminense.
- Honor Mention - Comissão Organizadora da 8ª Semana de Integração Acadêmica da UFRJ – Jun/2018