

DIOGO FILIPE RODRIGUES

Electrical Engineer, Power Electronics

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LinkedIn · Engineering portfolio

PROFILE

Electrical engineer with experience since 2020 in power electronics, embedded firmware and converter control for EV charging, wind energy and automotive systems. Contributed to a 250 kW charging module through circuit simulation, prototype debugging, firmware development and laboratory validation. Combines hands-on hardware work with control software investigation and validation in emulation and real systems.

CORE EXPERTISE

Power electronics

AC/DC and DC/DC converters; bidirectional converters; gate drivers; MOSFET losses; signal conditioning; hardware and software protections; open-loop and closed-loop control.

Embedded software and data

C; C++; Python; SQL; STM microcontrollers; STM32CubeIDE; CAN; firmware updates over the air (OTA); BUSMASTER; Kvaser.

Design and simulation

MATLAB/Simulink; PLECS; PSIM; LTspice; Altium; Zuken CR5000/Design Gateway.

PROFESSIONAL EXPERIENCE

Converter Control Engineer

Vestas via Capgemini Engineering | Jan 2026 - Present

• Reduced false startup alarms and associated non-production periods by analysing alarm histories across turbine variants, correcting C code and introducing suppression windows for asynchronous hardware startup. Validated in converter emulation and a test turbine.

• Mitigated reactive-power spikes when turbines resumed operation by correcting the converter capability reported to the power plant controller (PPC). Validated through joint converter/PPC emulation and field tests performed by the reporting teams.

Power Electronics Engineer

i-charging | Sep 2023 - Dec 2025

• Contributed across the development lifecycle of an in-house 250 kW module for a modular Megawatt Charging System (MCS) for heavy-duty electric vehicles.

• Simulated and debugged signal-conditioning, measurement and protection circuits. Selected a DC/DC gate driver and designed an adapter board (layout) for testing a different gate driver and laboratory validation.

• Developed control-board firmware for voltage/current/temperature acquisition, contactor and MOSFET status, OTA updates, software supervision, AC/DC input-stage control and main DC/DC control.

• Validated open-loop and closed-loop operation, including two 250 kW modules in parallel with bidirectional loads up to 500 kW. Diagnosed and reworked prototype boards. The team module reached readiness to begin certification.

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EDUCATION

MSc in Electrical and Computer Engineering | FEUP, University of Porto | 2015 - 2020

Major in Automation, Electronic Systems; average grade 16.7/20.

Erasmus exchange | University of Southern Denmark, Odense, Denmark | Sep 2018 - Jan 2019.

LANGUAGES

Portuguese · Native

English · C1

Spanish · B1

German · A1

A1.1 and A1.2 certificates

TEACHING

Teaching Assistant
FEUP · Sep 2019 - Mar 2020

Supported introductory electronics and Electrical Machines laboratories.

Tutoring

Tutored university students in circuits, electronics, MATLAB and C/C++.

PROFESSIONAL EXPERIENCE

Hardware Engineer

Continental Engineering Services | Nov 2021 - Sep 2023

• Contributed to a 3.5 kW bidirectional DC/DC converter supplied by a 48 V battery: synchronous buck schematics, circuit validation and MOSFET-loss analysis to assess parallel-device configurations. Development progressed to certification testing.

• Investigated and proposed improvements to cell monitoring and balancing circuits in a BMS project; evaluated an integrated monitoring/protection solution using the supplier's spice model.

• Contributed to hardware architecture and vehicle-module schematics for an autonomous EV charging robot.

Power Plant Control Engineer Trainee

Vestas | Nov 2020 - Nov 2021

• Evaluated a third-party power meter for a German customer, comparing PPC active/reactive-power and voltage tracking, response time, overshoot and oscillation.

• Developed automated tests, reviewed MATLAB/Simulink control functions and executed emulation and remote tests on a German wind power plant. Validated the alternative meter while documenting performance limitations.

SELECTED ACADEMIC PROJECTS

Master's thesis | Bidirectional isolated DC/DC converter

Modelled an isolated bidirectional dual half-bridge converter with independent duty-cycle and phase-shift control. Derived power-transfer and transformer RMS-current relationships; developed averaged/state-space models and studied MIMO control with PID and cross compensation. Validated against detailed MATLAB/Simulink and PLECS simulations.

SDU Formula Student

Contributed to topology selection, loss analysis, assembly and testing of a 480 W isolated Two-Switch Forward converter in a three-student team.

AGV navigation

Worked in a ten-student team over a six-month academic project, helping define requirements, allocate work and manage coordination and conflicts. Implemented C++ line navigation between points using position estimates supplied by the team (based on Kalman filter)