EFRÉN RODRÍGUEZ RODRÍGUEZ

INSTRUMENTATION PHYSICIST

CONTACT

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PROGRAMMING

- Python
- WinCC
- VHDL
- C ++
- LabVIEW
- Fortran
- ROOT

LANGUAGES

🔖 English
(Intermediate, B2)

🔖 German
(Beginner, A1.1)

🔖 Galician
(Native, Celga4)

🔖 Spanish
(Native)

PERSONAL PRESENTATION

PhD student in Nuclear and Particle Physics at the Galician Institute of High Energy Physics (IGFAE), specializing in vertex detectors for high energy physics, in over four years of experience, I have contributed to design, construction and commissioning of LHCb's silicon pixel vertex detector and the Timepix4 Beam Telescope. My expertise in electronics for physics experiments and passion for research fuel my commitment to making impactful contributions in instrumentation for high energy physics.

WORKING EXPERIENCE

PhD Candidate
IGFAE - USC | Sep. 2019 - Sep. 2024

ASIC characterization and sensor technologies for pixel silicon particle detectors. Commissioning for the recently installed VELO silicon pixel detector of the LHCb experiment at CERN. This includes construction of high-speed data transmission lines and development of characterization set-ups for signal integrity. Development and calibration of an automatic X-ray irradiation set-up for radioactive aging of electronic components. Algorithm development for fast threshold calibration for the VELO detector, programming control applications and FPGAs. Characterization, development and optimisation the temporal resolution of the Timepix4 Beam Telescope for research on future fast timing pixel detectors.

Invited Researcher
Nikhef | Jun. 2022 - May 2023

Characterized the Timepix4 silicon pixel readout ASIC and made major contributions to the design, construction, and control of the Timepix4 Beam Telescope for silicon pixel detectors research. Actively participated in six test beam campaigns, taking a coordinating role in several. Developed the timing analysis for the telescope, achieving an impressive 90 ps track resolution for a telescope that also provides a ~2 μm pointing resolution. Enabling the research of new high-performance silicon pixel sensors and ASICs with enhanced timing capabilities at high rate.

Invited Researcher
CERN | Aug. 2021 - Dec 2021

Commissioning of the VELO silicon pixel vertex detector for the LHCb experiment at CERN, including installation and calibration tools development, counting algorithm development, WinCC programming, and data analysis. Development of testbeam set-up with a EUDET-type Beam Telescope for irradiated and non-irradiated 3D column silicon sensors with LGAD sensor as time reference. Designed automatic DAQ control board that allows a simple interface of any system with EUDET TLU.

Internship

IGFAE - USC | Jun. 2018 - Jun. 2019

Designed a set-up for 3D mapping and characterization of an X-ray beam. Development of automatic positioning system for equivalent dose irradiation, mimicking the radiation conditions of the LHCb experiment at CERN. Analysis of the deterioration of pixel silicon sensors due to ionizing radiation.

EDUCATION

PhD in Nuclear and Particle Physics

University of Santiago de Compostela | Sep. 2020 - Sep 2024

Physics Master's Degree

University of Santiago de Compostela | Sep. 2019 - Sep. 2020

- Specialized in Nuclear and Particle Physics

Physics Degree

University of Santiago de Compostela | 2015-2019

COURSES AND SEMINARS

INF-303: Python IT Specialist certification Nov. 2023
Pearson

Applied Machine Learning Using Python Jun. 2022
Smart Mind

4th HEP C++ Course and Hands-on Training Apr. 2022
Software Institute for Data Intensive Sciences

The 39th RD50 Workshop - Radiation hard semiconductor devices for very high luminosity collider Nov. 2021
CERN

Data Science: Workflow and Programming Principles Nov. 2021
University of Santiago de Compostela

Introduction to thermography, use and management of Flir A400 Apr. 2021
Álava Ingenieros

Course on semiconductor radiation detectors Apr. 2021
Barcelona Techno Week - University of Barcelona

GitHub CI+CD Introductory Course and Hands-on Training Feb. 2021
HEP Software Foundation and IRIS-HEP

Quantum Computation and High Performance Computing 2019 Workshop
CiTiUs - University of Santiago de Compostela

VHDL language and design flow (Leuven, Belgium) Sep. 2019
IMEC academy