

# DEIJANY RODRIGUEZ LINARES

Ph.D. in Electrical Engineering with Specialization in Communication Systems

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deijany

Linköping, Sweden



## PROFILE

PhD researcher in signal processing working on estimation, compensation, synchronization, linearization, and equalization, with a strong focus on robustness under non-ideal hardware effects and noisy conditions. Develops hardware-aware, low-complexity algorithms, including neural-network-inspired linearizers, alongside classical model-based techniques.

## EXPERIENCE

Ph.D. Candidate — Communication Systems

(Defended: April 17, 2026)

Linköping University

2021 – Present

Linköping, Sweden

- Ph.D. research conducted on low-complexity, hardware-aware signal processing algorithms (ELLIIT project: Baseband Processing for Beyond 5G Wireless)
- Development of efficient sampling-frequency offset estimation and compensation methods for wideband systems, enabling robust synchronization under hardware constraints
- Design of low-complexity, learning-inspired linearizers for ADCs and data converters, covering memoryless and frequency-dependent nonlinearities before and after sampling, under hardware constraints
- Equalization of DAC frequency-response distortions using linear-phase FIR filters across multiple Nyquist bands
- Derivation of closed-form model-order and complexity predictions using symbolic regression and structured optimization
- Design of hardware-efficient algorithms with emphasis on complexity, latency, and practical implementation constraints
- Full RTL implementation and FPGA validation of efficient time-index powered weighted sum computation on a Lattice ECP5, using Verilog, Yosys, and Project Trellis
- Teaching assistant for Signal Processing for Communications, Analog Filters, and Digital Filters

Teaching and Research Assistant

University of Havana (InSTEC)

2019 – 2020

Havana, Cuba

- Researched deep learning combined with Monte Carlo radiation transport to improve prediction accuracy for low-probability interaction events
- Served as teaching assistant for Numerical Mathematics II and Fundamentals of Medical Physics

Medical Physicist — QA and Modeling

CECMED

2015 – 2018

Havana, Cuba

- Developed image processing for tumor detection and classification
- Performed Monte Carlo simulation of radiation transport for dose calculation and verification in treatment planning systems

## SKILLS

Signal Processing

Optimization

Estimation & Synchronization

Hardware-Aware DSP

Linearization

RTL / FPGA Validation

OFDM

Channel Estimation

## TECHNICAL SKILLS

Python / MATLAB



C++ / Git



Linux / Bash



Verilog / FPGA toolflow



## TOOLS / FRAMEWORKS

PyTorch, TensorFlow (incl. Keras), NumPy, SciPy, scikit-learn, JAX, SymPy, MLX  
Yosys, nextpnr, Project Trellis (ECP5)

## EDUCATION

Ph.D., Comm. Systems

Linköping University

2021–2026

Sweden

- Research on learning-based signal processing for low-complexity linearization, equalization, and synchronization
- Relevant coursework: Multiple Antenna Communications, Advanced Topics in MIMO, Modern Radar Systems, Signal Processing for Communications, Multirate Digital Signal Processing

M.Sc. in Nuclear Engineering (summa cum laude)

University of Havana (InSTEC)

2016–2018

Cuba

- Thesis: Deep learning for image recognition and breast tumor classification from X-ray sources

Diploma in Medical Physics

University of Havana (InSTEC)

2015–2016

Cuba

- Thesis: Monte Carlo-based pretreatment verification for IMRT

- Conducted dose plan verification, beam model validation, and participation in clinical quality assurance audits

## PUBLICATIONS

(LAST 3 YEARS)

### Journal Articles

- D. Rodriguez Linares, O. Moryakova, and H. Johansson, "Efficient computation of time-index powered weighted sums using cascaded accumulators," *IEEE Signal Process. Lett.*, pp. 1–5, 2026. DOI: 10.1109/LSP.2026.3661843.
- D. Rodriguez Linares, O. Moryakova, and H. Johansson, "Joint sampling frequency offset estimation and compensation algorithms based on the Farrow structure," *preprint arXiv:2603.00627*, 2026, Submitted to IEEE Open J. of Signal Process. DOI: 10.48550/arXiv.2603.00627.
- D. Rodriguez Linares and H. Johansson, "Low-complexity frequency-dependent linearizers based on parallel bias-modulus and bias-relu operations," *IEEE Access*, vol. 13, pp. 209 796–209 812, 2025. DOI: 10.1109/ACCESS.2025.3642613.
- D. Rodriguez Linares, H. Johansson, and Y. Wang, "Order estimation of linear-phase FIR filters for DAC equalization in multiple Nyquist bands," *IEEE Signal Process. Lett.*, vol. 31, pp. 2955–2959, 2024. DOI: 10.1109/LSP.2024.3483008.
- A. E. Quiñones-Espín, M. Perez-Diaz, R. M. Espín-Coto, D. Rodriguez Linares, and J. D. Lopez-Cabrera, "Automatic detection of breast masses using deep learning with YOLO approach," *Health Technol.*, vol. 13, no. 6, pp. 915–923, 2023. DOI: 10.1007/s12553-023-00783-x.

### Conference Proceedings

- D. Rodriguez Linares, O. Moryakova, and H. Johansson, "Joint sampling frequency offset estimation and compensation based on the Farrow structure," in *Proc. 25th Int. Conf. Digit. Signal Process. (DSP)*, 2025, pp. 1–5. DOI: 10.1109/DSP65409.2025.11074995.
- D. Rodriguez Linares and H. Johansson, "Digital linearizer based on 1-bit quantizations," in *Proc. IEEE 24th Int. Conf. Commun. Technol. (ICCT)*, 2024, pp. 1659–1663. DOI: 10.1109/ICCT62411.2024.10946352.
- D. Rodriguez Linares and H. Johansson, "Low-complexity memoryless linearizer for analog-to-digital interfaces," in *Proc. 24th Int. Conf. Digit. Signal Process (DSP)*, 2023, pp. 1–5. DOI: 10.1109/DSP58604.2023.10167765.

## SELECTED PROJECTS

### Time-Index Powered Weighted Sums – IEEE SPL 2026

[github.com/deijany/SPL-44561-2025](https://github.com/deijany/SPL-44561-2025)

### Farrow-Based SFO Estimation – DSP 2025

[github.com/deijany/DSP2025-107](https://github.com/deijany/DSP2025-107)

### RL Portfolio (PPO, Masked PPO, MARL)

[github.com/deijany/reinforcement-learning-coursework](https://github.com/deijany/reinforcement-learning-coursework)

## B.Sc. in Energy & Nuclear Technology

University of Havana (InSTEC)

2010–2015

Cuba

- Thesis: Optimization of a quality control procedure for IMRT

## TECHNICAL TRAINING

(EXAM- OR PROJECT-BASED)

### ML for Dark Matter Search

ICTP

2019

Trieste, Italy

- Project-based ML methods for weak-signal detection in large-scale, low-SNR data

### Parallel and Distributed Computing

ICIMAF

2018

Havana, Cuba

- Exam-based training in parallel programming and distributed computing

### Scientific Software Development

Sharif University of Technology & ICTP

2018

Tehran, Iran

- Project-based training in collaborative open-source scientific software development

### Monte Carlo Simulation

ICTP & IAEA

2017

Trieste, Italy

- Advanced training in Monte Carlo simulation and modeling techniques (based on EGSnrc)

## CERTIFICATIONS

Deep Learning Specialization

(DeepLearning.AI)

TensorFlow Developer Certificate

(DeepLearning.AI)

## AWARDS

ICTP Travel Award and Full Scholarship (2017, 2018, 2020)

National Scholarship of the Ministry of Education, Cuba (2010–2015)

## MEMBERSHIP

Junior Associate, ICTP (2019–2024)

## LANGUAGES

Spanish (Native)

English (Fluent)

## REFEREES

References available upon request