

# DEIJANY RODRIGUEZ LINARES

Ph.D. student 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  
(Expected graduation: 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 communication systems
- 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
- Hardware-efficient algorithm design emphasizing implementability, complexity analysis, and on-device deployment
- 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
- Conducted dose plan verification, beam model validation, and participation in clinical quality assurance audits

## SKILLS

Signal Processing

Optimization

Estimation & Synchronization

Hardware-Aware DSP

Linearization

## TECHNICAL SKILLS

Python / MATLAB

C++ / Git

Linux / Bash



## TOOLS / FRAMEWORKS

PyTorch, TensorFlow (incl. Keras), NumPy, SciPy, scikit-learn, JAX, SymPy, MLX

## EDUCATION

Ph.D. (ongoing), Comm. Systems

Linköping University

2021–Present Sweden

- Research on learning-based signal processing for low-complexity linearization, equalization, and synchronization

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

B.Sc. in Energy & Nuclear Technology

University of Havana (InSTEC)

2010–2015 Cuba

- Thesis: Optimization of a quality control procedure for IMRT

## PUBLICATIONS

(LAST 3 YEARS)

### Journal Articles

- D. R. Linares, O. Moryakova, and H. Johansson, "Joint sampling frequency offset estimation and compensation algorithms based on the Farrow structure," *IEEE Open J. Signal Process.*, 2026, Manuscript in preparation as Journal extension of DSP 2025 conference paper (12–page draft).
- D. Rodriguez-Linares, O. Moryakova, and H. Johansson, "Efficient computation of time-index powered weighted sums using cascaded accumulators," *IEEE Signal Process. Lett.*, 2026, Accepted for publication. [Online]. Available: <https://arxiv.org/abs/2509.15069>.
- D. R. 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. R. 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-Díaz, R. M. Espín-Coto, D. R. 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. R. 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. R. 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. R. 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 PROJECT

RL Portfolio (PPO, Masked PPO, MARL)

PhD coursework

📅 2024–2025

Code and reports:

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

## 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)

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