

DEIJANY RODRIGUEZ LINARES

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

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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. 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. Rodriguez-Linares, O. Moryakova, and H. Johansson, “Efficient computation of time-index powered weighted sums using cascaded accumulators,” *IEEE Signal Process. Lett.*, 2025, Accepted (minor revision). DOI: 10.48550/arXiv.2509.15069.
- 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

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

Prof. Håkan Johansson (Ph.D. supervisor)

Prof. Erik G. Larsson (Head of Division)

References available upon request