Rubem Vasconcelos Pacelli

General Information

Fortaleza, Ceará, Brazil
Federal University of Ceará (UFC)
UFC-PPGETI-GPSI

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Carrer Summary

Skilled Engineer with academic experience in Satellite Communications and multidisciplinary background in

- Deep Learning, Pattern Recognition, System Identification.
- Estimation, Detection and Optimization Theory, Adaptive Filtering.
- FPGA (Field Programmable Gate Array) and DSP (Digital Signal Processor).

Education

BSc in Electronics Engineering — Jan 2013-Dec 2018
University of Fortaleza (Unifor) — Fortaleza, Brazil

Msc in Teleinformatics Engineering — Jan 2019-Jun 2021
Federal University of Ceará (UFC) — Fortaleza, Brazil

PhD in Teleinformatics Engineering — Jul 2021-Present
Federal University of Ceará (UFC) — Fortaleza, Brazil

Experience

E1 IRD-UFC research partnership — Jun 2019-Dec 2020
Federal University of Ceará (UFC) — Fortaleza, Brazil

- Research on Machine Learning and Statistical Signal Processing.
- Developed a research project in collaboration with the IRD (Research Institute Pour Le Développement, France).

Projects and Research Funding

Pr1 Research and development of a fully digital modem for satellite communications — Jun 2019-Jun 2021

Master scholarship from Coordination for the Improvement of Higher Education Personnel (CAPES)

- Fully digital modem for satellite communications, targeting its implementation in FPGAs.
- Design of the logical architecture of the modulator and demodulator.
- Development of synchronization modules for the symbol timing delay and phase offset.

Pr2 Noncoherent GMSK demodulator for CubeSat systems — Feb 2017-Jan 2018

Scientific initiation scholarship from National Council of Scientific and Technological Development (CNPq)

- Development of noncoherent GMSK demodulator for CubeSat systems.

Pr3 Synchronization in OFDM systems — Feb 2016-Jan 2017

Scientific initiation scholarship from National Council of Scientific and Technological Development (CNPq)

- Research on synchronization techiniques applied to OFDM systems.

Pr4 Synchronization of signals with multicarrier — Feb 2015-Jan 2016

Scientific initiation scholarship from National Council of Scientific and Technological Development (CNPq)

- Research on synchronization techniques applied to multicarrier systems.

Skills

Technical

- Scientific programming languages: Python, Julia, R, MATLAB/Simulink, Octave.
- Embedded systems programming languages: C, C++, MicroPython, and Assembly.
- Hardware Description Languages: VHDL.
- Electronic design automation (EDA)
  - PCB (printed circuit board) design: Altium, KiCad, EasyEDA, Proteus.
  - Circuit simulation: LTspice, Multisim, Proteus.
- GNU/Linux: UNIX Shell scripting, Linux system fundamentals, git.
- Typesetting systems: LaTeX, Typst.

Languages

- English: Professional working proficiency (TOEFL IBT and Cambridge FCE exams).
- Portuguese: Native speaker.

Teaching and support

- I had experience as an assistant teacher in Digital Communications at UFC during my Doctorate's degree in Teleinformatics Engineering.
- I had experience as an assistant teacher in Digital Signal Processing at UFC during my Master's degree in Teleinformatics Engineering.
- I had experience as an assistant teacher in Control Theory at Unifor during my undergraduate in Electronics Engineering.

Academic Activity & membership

Associate member

- Brazilian Telecommunications Society (SBrT)

Publications

My academic publications are also listed on Google Scholar.

Theses

- Doctorate's thesis in Teleinformatics Engineering. "Detection, characterization, and forecasting of the equatorial ionospheric scintillation signal on GNSS receive". Advised by Prof. Dr. Felix Dieter Antreich and Prof. Dr. André Lima Ferrer de Almeida.
- Master's thesis in Teleinformatics Engineering. "Coherent and all-digital AFSK modem for TT&C module of CubeSat systems" (in Portuguese). Advised by Prof. Dr. João Cesar Moura Mota and Prof. Dr. Antônio Macilio Pereira de Lucena.
- Graduation's thesis in Electronics Engineering. "Design of a portable charger converter with USB Type-C interface" (in Portuguese). Advised by Prof. Dr. Bruno Ricardo de Almeida.

Journal Articles

J1 Pacelli, R. V., Lucena, A. M. P.."Fully digital GMSK modem with noncoherent demodulation" (in Portuguese). Brazilian Journal of Development, vol. 6, n. 4, p. 17988-17996, 2020.

J2 Pacelli, R. V., Lucena, A. M. P.."Carrier synchronization technique for OFDM communication systems" (in Portuguese). Brazilian Journal of Development, vol. 6, n. 3, p. 14297-14305, 2020.

J3 Figueiredo, S. S., Lucena, A. M. P., Pacelli, R. V.."Carrier selection technique for OFDM system in time-dispersive channels" (in Portuguese). Brazilian Journal of Development, vol. 6, p. 14318-14324, 2020.

J4 Pacelli, R. V., Lucena, A. M. P.."OFDM system with frequency and phase estimators for carrier synchronization" (in Portuguese). Revista Tecnologia, vol. 40, n. 1, p. 1-16, 2019.

Conference Proceedings

C1 Moreira, N. A., Pacelli, R. V., Silva, Y. C. B., Maciel, T. F., Simoes, I., Mota, J. C. M., Hamida, C., Prado, R. Z., Caillault, E., Kacou, M., Gosset, M.."Convolutional Long-Short-Term Memory Networks (ConvLSTM) for Weather Prediction using Radar and Satellite Images". CBA 2022, p. 1-8, 2022.

C2 Pacelli, R. V., Mota, J. C. M., Lucena, A. M. P.."All-digital AFSK modem with Viterbi detection for TT&C CubeSat transceiver". XXXVIII Simpósio Brasileiro de Telecomunicações e Processamento De Sinais, p. 1-5, 2022.

C3 Mourão, J. A, Pacelli, R. V., Lucena, A. M. P.."A technique for frequency synchronization in OFDM modulation" (in Portuguese). XXII Research Initiation Meeting, p. 1-5, 2016.

Book chapter

BC1 Pacelli, R. V., Lucena, A. M. P., Araújo, D. C., Mourão, J. A."Symbol time synchronization in OFDM systems" (in Portuguese). Chapter 18 in Exact and Earth Sciences: Exploration and Qualification of Different Technologies, p. 200-207, 2021.

BC2 Pacelli, R. V., Lucena, A. M. P.."GMSK modem with noncoherent demodulation and all-digital implementation" (in Portuguese). Chapter 2 in The impacts of studies focused on exact sciences, p. 21-30, 2020.

Patents

BR 10 2021 023220 0

- Digital demodulation architecture and coherent detection method for AFSK signals (in Portuguese).
- Status: filed.