CURRICULUM VITAE

PERSONAL DATA

Name: Luis Carlos Carneiro Gonçalves

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Summary

I have expertise in multidisciplinary domains including Telecommunications, Parallel Computing, Image Processing and Mathematics. I gained scientific knowledge in Telecommunications during the period of my PhD studies. Before that, I was employed by several companies including Texas Instruments and Blaupunkt where I obtained valuable technical skills. I lectured in several disciplines at three Universities which enabled me to solidify my theoretical knowledge. I did a PostDoc in Cognitive Radio, with support from the Portuguese Foundation for Science and Technology (FCT), and I participated in a European Project in which I co-supervised a Master's degree thesis research. In collaboration with other inventors, I had an idea and produced an invention and it was awarded a patent in November 2015. I also did a PostDoc in Radio propagation, Wireless Signal Measurement and Baseband Signal Impairment Compensation in CITI/INSA, Lyon, France. I carried out a PostDoc on High Performance Computing applied to Telecommunications (with an implementation of the algorithm defended in the PhD) at the University of Aveiro. I did a one-year PostDoc at INESC TEC (Vila Real, Portugal) in Digital Image Processing. I had a role of researcher at Institute of Telecommunications at Aveiro with practice in OpenAirInterface and 5G. I completed a PostDoc in Medical Digital Image Processing at the University of Aveiro. I completed a PostDoc in Medical Digital Image Processing at the University of Aveiro. I worked as Senior Researcher in OHB Digital Solutions (now OHB Austria). I just completed one year contract as Senior Researcher at Institut Polytechnique de Paris, Télécom SudParis in Data Analytics for Telecommunications.

Core Competencies

- Knowledge of Image Processing in a PostDoc at INESC TEC and University of Aveiro.

- Good knowledge of Parallel Computing in a PostDoc at University of Aveiro and at INESC TEC.

- Excellent Knowledge in Telecommunications with emphasis on Multiuser Detection for DS-CDMA Systems, 5G and 4G.

- Very Good Knowledge in Telecommunications with emphasis on Cognitive Radio, Wireless Signal Measurement and Baseband Signal Impairment Compensation.

- General Knowledge in Electronics got in the degree, University teaching and in working in several companies.

- Knowledge of Programming Languages as tools for supporting my scientific work and former teaching.

Professional Career

- 16th **January 2023 - September 2023**, Senior Researcher in Global Navigation Satellite System (GNSS) at OHB Digital Solutions at Graz, Austria.

  - Implementation of MUSIC algorithm in Matlab, Python and C++. Field tests. Implementation in C++ of Filter to remove noise and outliers of the angles of arrival.

  - Computation of intersection point to find a jammer position with the information of the Angle of Arrivals in several linear arrays of two antennas.

- **June 2017 to February 2018**, Ported program of Motorola DSP board (16 bits) to Texas Instruments LAUNCHXL-F28069M for Allied Motion, Vila do Conde, Portugal. Board with Texas Instruments DSP with functions of micro-controller ADC, PIO, Timer, 3 Phase PWM, Quadrature Decoder etc. CCSTUDIO IDE.

- **2010 to 2012**, Realization of two Software Projects for Globe Motors (now Allied Motion), Vila do Conde, Portugal, involving C programming of a DSP and LabView. Done a third project which includes beyond DSP programming and LabView, a hardware circuit design. The drive of the Motors were with PWM (from DC to Three Phase). Them all were for a test production place. The achievements were more reliability in the tests and less time of the tests. The all production chain time was shortened.

- **March 1998 to February 1999**, Maintenance and Development Engineer at MARTONIC. The maintenance work was done mainly on glass working machines and saw machines on electronic circuits.

- **October 1997 to March 1998**, Maintenance Engineer at BLAUPUNKT. Mainly the work was the data treatment of a database (DBase).

- **April 1996 to October of 1997**, Computer Engineer at BLAUPUNKT.

- **April 1992 to April 1996**, Process Engineer at BLAUPUNKT, Audio and Video Company in Braga, Portugal.

- **October 1991 to April 1992**, Equipment Engineer at TEXAS INSTRUMENTS, Maia, Portugal.

Academic Career

- 1st **December 2023 - 30th November 2024**, Senior Researcher in Telecommunications, Cloud and Data Analytics at Institut Polytechnique de Paris, Télécom SudParis at Palaiseau, Île-de-France, France. Article submitted to a journal.

- 16th **January 2020 to 30th June 2022**, PostDoc Researcher at ESAN/University of Aveiro in Medical Digital Image Processing. Project ARTHUR. 3D Image Registration. Packages SimpleITK, PyCuda. Unstructured image (Meshes) manipulation with C. Package VTK in C++ and Python. Package Ctypes (Python).

  - Developed Client-Server solution (Web Browser-Program Python and C) for Image Processing of the head and dentistry medical operation.

  - Facial preview of a bilateral sagittal split osteotomy (BSSO).

- 1st **June 2018 to 31st December 2019**, Researcher from Institute of Telecommunications at Aveiro in 5G Telecommunications. Projects Mobilizador 5G and ORCIP. Subjects: OpenAirInterface, 5G.

- 1st **March 2017 to 28th February 2018**, Post-Doc Researcher at INESC TEC (Vila Real, Portugal) in Digital Image Processing. Knowledge, Mantiuk'08 TMO, IOIndustries Flare Camera + BitFlow Frame Grabber, Debevec Photo Merge, Photo Debayer, OpenCV, PFStools, HDRtools

- – Successfully reimplemented a widely used and highly regarded tone mapping algorithm for integrated High Dynamic Range video processing pipeline for object detection and tracking
  - – Developed a solution to capture and merge in HDR images using Low Dynamic Range Flare image camera
- 1st **March 2014 to** 28th **February 2017**, Post-Doc Researcher at University of Aveiro (High Performance Computing for Telecommunications).
- 1st **June 2013 to** 28th **February 2014**, Post-Doc Researcher at Institute of Telecommunications at Aveiro (Cognitive Radio and Spectrum Occupation).
- 1st **June 2012 to** 31st **May 2013**, Post-Doc Researcher at Centre of Innovation in Telecommunications and Integration of Services (CITI) of Institut National des Sciences Appliquées (INSA) de Lyon.
- 1st **March 2010 to** 31st **May 2012**, Post-Doc Researcher at Institute of Telecommunications at Aveiro (Cognitive Radio and Spectrum Occupation).
- **September 2009 to February 2010**, Assistant Professor at Lusófona University at Lisbon.
- **September 2004 to August 2008**, Invited Lecturer at University of Madeira.
- **December 1999 to November 2003**, PhD Grant of FCT.
- Previous Experiences in Companies - See Section "Professional Career".

Education

- 18th **September 2009**, PhD in Electrical Engineering (Telecommunications), Unanimous, in University of Aveiro. The title was *Detecção Multiutilizador no Domínio da Frequência para Sistemas DS-CDMA* (*Multiuser Detection in Frequency Domain for DS-CDMA Systems*). It is the reference (plus the article *European Transactions on Telecommunications*) to the theoretical application of *Fresh Filters* in frequency domain to DS-CDMA systems.

  http://ria.ua.pt/bitstream/10773/2225/3/2010000093.pdf

- **1991**, Degree (5 years) in Electronics and Telecommunications Engineering, at Aveiro University, with average/grade of 15 on a maximum of 20.

- High School at Maia. Admission at University with an average/grade of 18.7 (Grade to apply to University, Admission Exams Included).

Patents

- 24th **November of 2015**, Luís Gonçalves (50% share), Diogo Cunha, Atílio Gameiro, *Method to Determine the Delay between Measurements in two or more Spectrum Analyzers or Power Meters*. Conceded by Instituto Nacional da Propriedade Industrial (INPI). Number 107293B.

  Conceded Patent Link   *Bulletin*

Published Articles

http://orcid.org/0000-0001-7358-4113

* - Attended Conference

- **July 2021**, Luis Gonçalves, Rui Martins, António Ferrari, *Realtime Parallel Software Implementation of a DS-CDMA Multiuser Detector*, published online, in Microprocessors and Microsystems, Elsevier. Impact Factor - 3.503

  https://doi.org/10.1016/j.micpro.2021.104051

- **August 2016**, Luís Gonçalves, Diogo Cunha, Method to Determine the Delay between Measurements in two or more Spectrum Analyzers or Power Meters, Recent Advances in Communications and Networking Technology, Bentham Science Publishers, Volume 5, Issue 2.

  http://dx.doi.org/10.2174/2215081105666161128142559

- **16-18 September 2015**, Luis Gonçalves, Rui Martins, António Ferrari, *Software Parallel Implementation of a DS-CDMA Multiuser Detector*, presented at The 23rd International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2015), Split-Bol (Island of Brac), Croatia. Realtime Implementation of the Multiuser Detector studied in the Phd*

  http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7314124

- **March 2013**, G. Villemaud, L. Gonçalves, M. Luo, J. Weng, P. Wang, *Measurement Campaigns and Model Calibration*, D1.4 Progress Report, iPlan project.

  http://iplan.project.citi-lab.fr/files/D1_4.pdf

- **June 2012**, Deepaknath Tandur, Jonathan Duplicy, Kamran Arshad, David Depierre, Janne Lehtomäki, Keith Briggs, Luis Gonçalves, Atilio Gameiro, *Cognitive Radio Systems Evaluation: Measurement, Modeling and Emulation Approach* in IEEE Vehicular Technology Magazine (special issue on applications of cognitive radio networks), Volume 7, Issue 2, pages 77-84. Impact Factor - 13.609

  http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6182685

- **10-14 September 2011**, L. Mendes, L. Gonçalves, A. Gameiro, *GSM Downlink Spectrum Occupancy Modeling* in IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'11), Toronto, Canada. Interesting Analysis of the Measurement Setup. Modeling of GSM Spectrum Occupancy. *

  http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6140021

- **June 2008**, L. Gonçalves, A. Gameiro, *Erratum: Multi-Sensor Frequency Domain Multiple Access Interference Canceller for DS-CDMA Systems* in European Transactions on Telecommunications, Wiley & Sons, Volume 19, Issue 4, Page 495. Erratum of the article below, Impact Factor - 3.310

  http://doi.wiley.com/10.1002/ett.1297

- **April 2007**, L. Gonçalves, A. Gameiro, *Multi-Sensor Frequency Domain Multiple Access Interference Canceller for DS-CDMA Systems* in European Transactions on Telecommunications, Wiley & Sons, Volume 18, Issue 3, Pages 263–273. Article of Reference of the use of *Fresh Filters* in Frequency Domain in Multiuser Detection in DS-CDMA Systems. This detector has advantages in relation to MMSE detector in an implementation in WCDMA-TDD or TD-CDMA (Popular Republic of China). A *chip* implementation can have energy savings in mobile phones. , Impact Factor - 3.310

  http://doi.wiley.com/10.1002/ett.1146

- **30 August - 2 September 2004**, L. Gonçalves, A. Gameiro, *Multi-Sensor Frequency Domain Multiple Access Interference Canceller for DS-CDMA Systems* in IEEE International Symposium on Spread Spectrum Techniques and Applications (ISSSTA 2004), Sofitel Wentworth Hotel, Sydney, Australia. *

  http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=1371657

- **19 to 22 October of 2003**, L. Gonçalves, A. Gameiro, *Multiuser Frequency Domain Equalizer for Multirate UMTS-TDD Systems* in The 6th International Symposium on Wireless Personal Multimedia Communications (WPMC' 03), Yokosuka, Kanagawa, Japan. *

- **18 to 20 June 2003**, F.Alves, A. Morgado, L.Gonçalves, A. Silva, A. Gameiro, *Implementation of a Simulation Module for a SISO Broadband Propagation Channel Model* presented 4th Conference on Telecommunications (Conftele 2003), Aveiro, Portugal.

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- **11 to 15 May of 2003**, L. Gonçalves, A. Gameiro, *Frequency Domain Equalizer for Multirate UMTS-TDD Systems* presented IEEE 2003 International Conference on Communications (ICC'03), Anchorage, Alaska, USA. Complexity Analysys - Advantage over MMSE Detector. *

  http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=1204036

- **15 to 18 September 2002**, L. Gonçalves, A. Gameiro, *Frequency Shift based Multiple Access Interference Canceller for Multirate UMTS-TDD Systems* presented The 13[th]IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'02) Pavilhão Atlântico, Lisboa, Portugal. *

- **7 to 11 October 2001**, L. Gonçalves, A. Silva, A. Gameiro *Frequency Shift based Multiple Access Interference Canceller for DS-CDMA Systems* presented Vehicular Technology Conference 2001 Fall (VTC'01 Fall), Atlantic City-USA. *

- **15 to 20 July 2001**, L. Gonçalves, A. Gameiro, *Frequency Shift based Multiuser Canceller for DS-CDMA Systems* in Sixth International Symposium on Commun ications Theory & Applications (ISCTA'01) Ambleside-Lancaster England. *

- **23**, **24 April of 2001**, P. Pinho, A. Morgado, L. Gonçalves, J. Fernandes and A. Gameiro, *Link Level Evaluation Platform with Space-time Processing for UMTS TDD* in Confetele 2001, Figueira da Foz.

- **1 to 4 October 2000**, A. Morgado, L. Gonçalves, P. Pinho, J. Fernandes and A. Gameiro, *Advanced Space-Time Multiuser Receiver for Uplink TDD Mode of UMTS* in IST Mobile Communications Summit 2000, Galway, Ireland.

Projects Participation

- Project ARTHUR - 3D DENTOFACIAL SURGERY FULL PLANNING

- Projects Mobilizador 5G (Components and Services for 5G Networks) and ORCIP (Optical Radio Convergence Infrastructure for Communications and Power delivering)

- HDR4RTT (Real Time Tracking and Display of Multiple Objects in Extreme Lighting Conditions)

- iPlan. The iPlan Project is a Marie Curie IAPP from FP7-PEOPLE-2007-3-1-IAPP. The goal of this project is to establish a strategic partnership between Ranplan, INSA and the University of Bedfordshire to develop the competencies which are needed for indoor radio network Planning and Optimization (P&O).

  http://iplan.project.citi-lab.fr/index.php

- QoSMOS (Quality of Service and MObility driven cognitive radio Systems) of FP7 - The primary objective of QoSMOS is to develop a framework for Cognitive Radio systems and to develop and prove critical technologies using a test-bed.

  http://www.ict-qosmos.eu/

- MATRICE (MC-CDMA Transmission Techniques for Integrated Broadband Cellular Systems) of FP5 - The main objective of the project is to define and validate access and transmission concepts based on MC-CDMA technology for provision of the broadband component of future mobile cellular systems.

- ASILUM (Advanced Signal Processing Schemes for Link Capacity increase in UMTS) of FP5 - The objective of the ASILUM project is to validate new transceivers concepts, for both base station and mobile terminal, to increase the capacity of the future generation of UMTS through new and efficient interference mitigation schemes.

- VISEF (Video Coding and Transmission on Wireless Networks) FCT (PRAXIS XXI) - The aim of the project consisted on the development of video coding algorithms and transmission techniques to attain high quality video services over third generation networks.

Teaching

- **September of 2014 to January of 2015**, Teaching at University of Aveiro on Introduction to Communication and Information Technology to Management Degree (Microsoft Office: Excel, Word, Outlook and PowerPoint).

- **September 2009 to February 2010**, Assistant at Lusófona University at Lisbon. Lectures and ruled Signals and Systems (Theoretics and Practice). It was done 13 exercises sheets for teaching support.

- **September 2004 to August 2008**, Invited Lecturer at University of Madeira. Lectures on

    – Electronics I (Theoretics and Practice) - +-450 slides to support the lectures were prepared.
    – Electronics II (Theoretics and Practice) - +-450 slides to support the lectures were prepared.
    – Telecommunications Fundamentals (Theoretics and Practice)
    – Telecommunications Fundamentals II (Practice)
    – Telecommunications Systems (Theoretics and Practice)
    – Digital Systems (Practice)
    – Circuits Analysis (Practice).

Student Guidance

- **14 of July 2011**, Co-oriented a Master Degree named "Measurements and Analysis of Spectrum Activity" by Luís Vinhas Mendes with a grade of 17 (in 20).

    http://ria.ua.pt/bitstream/10773/7725/1/244742.pdf

    This gave rise to a conference article that I attended.

- Orientation of student of University of Kassel (Germany) in university project (done at Blaupunkt).

Frequented Tutorials in Conferences, Summer Schools and WorkShops

- 4th **December 2018**, Automotive Testing Solutions Forum 2018 (ATS'2018), AEP - Portuguese Business Association

- **25-27 June 2014**, International Summer School on Parallel High Performance Computing Using Accelerators, University of Minho, Braga, Portugal.

- **10-14 Setembro 2011**, Opportunistic Spectrum Access: White Space Databases and Spectrum Sensing, Dr. Claudio R. C. M. da Silva (Virginia Tech, EUA) Dr. Marina Petrova (Aachen University, Alemanha), IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'11), Toronto, Canada.

- **30 August - 2 September 2004**, MIMO Systems - Prof. Helmut Bölcskei, Swiss Federal Institute of Technology (ETH) Zurich, Switzerland, 2004 IEEE International Symposium on Spread Spectrum Techniques and Applications (ISSSTA 2004), Sydney, Australia.

- **Oct. 2003**, Adaptation Techniques and Enabling Parameter Estimation Algorithms for the Evolution of Wireless Mobile Radio Systems – Huseyin Arslan, University of South Florida, USA – WPMC'03.

- **15-18 June 2003**, High Altitude Platform Stations and Related Technologies - Theirs Role in 3G and Beyond - Rahim Tafazolli, University of Surrey, UK - IST-Mobile & Wireless Communications Summit 2003, Aveiro, Portugal.

- **May 2003**, Orthogonal Frequency-Division Multiplexing for Wireless - Leonard Cimini Jr., University of Delaware; Ye (Geoffrey) Li, Georgia Institute of Technology - ICC'03.

- **Sep. 2002**, Interference modeling and its mitigation in Wireless Communications Systems - Asrar Sheikh - King Fahd University of Petroleum and Minerals - PIMRC'02.

Paper Revision

- Paper Revision for **European Transactions on Telecommunications**, **Wiley & Sons**

- **6-9 April 2020**, Paper Revision for **IEEE Wireless Communications and Networking Conference**: **WCNC2020**, **Seoul**, **South Korea**.

- **2-5 June 2013**, Paper Revision for **IEEE 77th Vehicular Technology Conference**: **VTC2013-Spring**, **Dresden**, **Germany**.

- **15-18 May 2011**, Paper Revision for **IEEE 73rd Vehicular Technology Conference**: **VTC2011-Spring**, **Budapest**, **Hungary**.

- **26–29 April 2009**, Paper Revision for **IEEE 69th Vehicular Technology Conference**: **VTC2009-Spring**, **Barcelona**, **Spain**.

- **3-7 September 2007**, Paper Revision for **IEEE 18th Annual International Symposium on Personal**, **Indoor and Mobile Radio Communications**, **Athens**, **Greece**.

- **17-19 May 2004**, Paper Revision for **IEEE Semiannual Vehicular Technology Conference**, **Milan**, **Italy**.

Experience with Software

- Experience in C++, C, CUDA (Nvidia GPU Architecture), OpenCL (Intel GPU) and OpenMP in Visual C and Gcc (Eclipse).

- Experience in Python.

- Experience on LabView of National Instruments (Post-Doc) and Agilent ADS.

- Experience in Visual C++ Microsoft Foundation Classes.

- During the PhD acquired experience in simulation software of telecommunications systems, System Studio of Synopsys (before named Cocentric and COSSAP) in SUN and LINUX (C, C++, Fortran).

- Most of my papers and PhD thesis were written in *Latex*.

- Experience in SystemC Programing in MATRICE project.

- The algorithms of the PhD Thesis were first tested with Matlab. Also the PostDocs involved programming in Matlab. Coding, Interface to Matlab and run of MEX compiled files.

- Experience in Electronic Simulation Program Pspice and MultiSim (Lectures of Electronic I and Electronic II at University of Madeira). Pspice was introduced in the Lectures by me.

- Code Composer Studio (Texas Instruments).

- Maintenance of a Linux Virtual Server (IPv6 Compliant) with Web Server (SSL) e Email Server (DMARC, DKIM and SPF) at *http://www.luisgo.pro*. Also not as public domain a webside with Drupal.

Languages

Native in Portuguese, Fluent in English, Professional knowledge of French and Basic knowledge German.

- English – 5 years at High School, one year in University, 4 terms at British Institute (now British Council) at Porto.

- French – 5 years at High School.

- German – 1 1/2 years at Blaupunkt.

Study Grants/Contracts

- 16th **January 2020 to** 30th **June 2022**, PostDoc Researcher bursary at ESAN/University of Aveiro in Medical Image Processing.

- 1st **June 2018 to** 31st **December 2019** with bursary from Institute of Telecommunications at Aveiro in 5G Telecommunications.

- 1st **March 2014 to** 28th **February 2017**, a PostDoctoral Bursary by the Technology and Science Foundation in Parallel Computing at University of Aveiro.

- 1st **June 2013 to** 28th **February 2014**, a PostDoctoral Bursary by the Technology and Science Foundation in Cognitive Radio. This work was done at Institute of Telecommunications at Aveiro.

- 1st **June 2012 to** 31st **May 2013**, a PostDoctoral Contract from FP7 European Commission at Institut National des Sciences Appliquées (INSA) de Lyon.

- **March** 1st **2010 to May** 31st **2012**, a PostDoctoral Bursary by the Technology and Science Foundation in Cognitive Radio. This work was done at Institute of Telecommunications at Aveiro.

- **Dec**. **1999 to Nov. 2003**, a Bursary for the PhD Graduation by the Technology and Science Foundation (FCT).

- **1990/1991**, Grant of Merit from TEXAS INSTRUMENTS, multinational company in the area of semiconductors.

Professional Experience

- **Project Participation**

  - Implementation of a simple communication program with *Handlers* (Chip transportation machines coupled to test machines) in Texas Instruments.

  - Study for future installation of line filters and varistors in Test Machines and Handlers at Texas Instruments.

  - Knowledge of conception of Car Radios (Blaupunkt End Product). Alignment (Radio Frequency) of Grundig High End Car Radio.

  - In two projects of data gathering of Car Radios by the various stages of production with name Computer Integration Production (CIP). It permitted the gathering of production data of AutoRadios for routing the radio through production and future statical treatment.

  - Segmentation of Blaupunkt production computer network (Bus Network) for reliability increase. Before there was much more production stopping due to cable discontinuity. It was initiative of mine.

- Installation of Structured Cable (Category 5) in production lines at Blaupunkt. It was a initiative of mine and at first it was against the Informatics Department and Administration will. Migration from a bus network to star network with reliability improvement at Physical Layer.

- **Other Activities (Blaupunkt)**

  - Administration of the Network of the Production.
  - Printers Management with integration de Windows NT, Netware e Mainframe IBM.
  - Web Page Construction (now at *http://www.luisgo.pro*)
  - C, Pascal, Basic, DBase and Btrieve programming. Installation of Netware servers and bridges.
  - Studying of the following subjects:
    * GSM Mobile Communications
    * TCP/IP - IV e VI Version
    * CDMA, WLL

- **Attended Course in**:

  - Seminar on Total Produtivity Management (TPM) at Texas Instruments
  - Obtained formation in the following subjects by Blaupunkt
    * Administration of Novell Networks by Beremiz.
    * Btrieve Databases by Beremiz.
    * Personnel Management and Supervision by "Homens e Sistemas".
    * Radio Frequency at Blaupunkt (Braga).
    * Alignment Systems (two) of Car Radios, Blaupunkt, Germany.
  - Seminars on Computer Networks and Software on Decada, Lusocresa, Beremiz, Microsoft and Novell.
  - **1992/1993**, Teacher of Electronic Technology at the Professional School at Maia, Portugal.