Wilder Lopes

Electronics Engineer, Ph.D.

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I am a research engineer with focus on design and implementation of statistical-learning algorithms. Currently, I am at UCit (www.ucit.fr) where I design machine-learning algorithms for applications in High-Performance Computing (HPC). In 2016 I earned a Ph.D. in Electronics Engineering from the University of Sao Paulo, Brazil. My interests include signal processing, adaptive filtering, artificial intelligence, machine learning, optimization, computer vision, applied mathematics, and HPC.

Experience

2017–on course **Algorithms R&D Engineer**. *UCit (www.ucit.fr)*, Palaiseau, France.
Research and development of machine-learning-based algorithms for optimization of High-Performance Computing (HPC) systems.

2016–2017 **Postdoc Researcher**. *Thales Group (Research and Technology)*, Palaiseau, France.
Design of artificial-intelligence algorithms for data partitioning in high performance computing platforms composed by heterogeneous devices, e.g., CPUs and GPUs. Supported by a Marie Curie Research Fellowship, European Union's Seventh Framework Programme (FP7-PEOPLE-2012-ITN, PITN-GA-2012-317446-INFIERI).

2014–2015 **Visiting Ph.D. Researcher**. *TU Munich*, Munich, Germany.
Year-long research stay. Design of adaptive-filtering algorithms for computer-vision applications, especially 3D registration of point clouds, using the Point Cloud Library (PCL).

2009–2010 **Analog and Mixed-Signal IC Engineer**. *LSITec*, Sao Paulo, SP - Brazil.
Design of analog and mixed-signal integrated circuits. Some circuits/blocks designed: Digital-to-Analog converters (DAC), Operational amplifiers, Frequency oscillators.

2007–2008 **Internship in Audio Engineering**. *Audium*, Salvador, BA - Brazil.
Design, simulation, and installation of electro-acoustics systems.

2007–2007 **Internship in Electronics Engineering**. *Squadra*, Salvador, BA - Brazil.
Design and fabrication of communication hardware (RS-232, RS-485, fiber optic). Programming of microcontrollers (embedded C).

Education

Degrees

2012–2016 **Doctorate (Ph.D.) in Electronic Systems Engineering**. *University of Sao Paulo*, Sao Paulo, SP - Brazil.
Dissertation: Geometric-Algebra Adaptive Filters.

2010–2012 **M.S. in Electronic Systems Engineering**. *University of Sao Paulo*, Sao Paulo, SP - Brazil.
Thesis: Incremental Strategies in Combination of Adaptive Filters.

2003–2008 **B.S. in Electrical Engineering**. *Federal University of Bahia*, Salvador, BA - Brazil.
Final Work: Digital Audio Signal Processing Using Wavelet Transform (in Portuguese).

Complementary Courses

2012 **CLTP 3 - CanSat Leader Training Program**. *Tokyo Metropolitan University*, Tokyo - Japan.
Five-weeks course on picosatellites. Construction and test of a Can Satellite (CanSat) with fully functional circuitry.

2008–2009 **Analog and Mixed-Signal IC Design (IC Brazil)**. *CTI Renato Archer*, Campinas, SP - Brazil.
Specialization course (6 months) on design of analog and mixed-signal integrated circuits. Training on Cadence Design Systems tools.

Computer skills

Programming **Python (numpy, sklearn, keras), C/C++, Matlab, Java, Cuda, OpenMP, HTML, CSS**
Hardware **Raspberry Pi, BeagleBone Black, Texas Instruments MSP430**
IDE **Atom, Qt Creator, Eclipse, Cadence**
O.S. **Linux, Windows**
Other **LaTeX, MS Office, Git, SVN, Docker, CMake, Point Cloud Library, OpenCV, LPSolve**

Languages

Portuguese **Native**
English **Fluent**
German **Intermediate**
French **Intermediate**
Spanish **Basic**

Publications

Lopes, Wilder B.; *Lopes, Cassio G.* "*Geometric-Algebra Adaptive Filters*". Preprint arxiv:1608.03450 [MATH.OC], 2016.

Lopes, Wilder B.; *Al-Nuaimi, Anas; Lopes, Cassio G.* "*Geometric-Algebra LMS Adaptive Filter and its Application to Rotation Estimation*" IEEE Signal Processing Letters, 2016.

Al-Nuaimi, Anas; ***Lopes, Wilder B.***; *Steinbach, Eckehard; Lopes, Cassio G.* "*6DOF Point Cloud Alignment using Geometric Algebra-based Adaptive Filtering*" IEEE WACV 2016 - Lake Placid, NY, USA.

Al-Nuaimi, Anas; ***Lopes, Wilder B.***; *Zeller, Paul; Garcea, Adrian; Lopes, Cassio G.; Steinbach, Eckehard* "*Analyzing LiDAR Scan Skewing and its Impact on Scan Matching*" IEEE IPIN 2016 - Madrid, Spain.

Lopes, Wilder B.; *Lopes, Cassio G.* "*Incremental Combination of RLS and LMS Adaptive Filters in Nonstationary Scenarios*" IEEE ICASSP 2013 - Vancouver, Canada.

Chamon, Luiz F. O.; ***Lopes, Wilder B.***; *Lopes, Cassio G.* "*Combination of Adaptive Filters with Coefficients Feedback*" IEEE ICASSP 2012 - Kyoto, Japan.

Lopes, Wilder B.; *Lopes, Cassio G.* "*Incremental-Cooperative Strategies in Combination of Adaptive Filters*" IEEE ICASSP 2011 - Prague, Czech Republic.

Grants

Marie Curie Research Fellowship (FP7-PEOPLE-2012-ITN, PITN-GA-2012-317446-INFIERI). *From April 2016 to January 2017.* Funded by the INFIERI network (an European Training Network) as an Experienced Researcher (ER) to carry out postdoctoral research at Thales Research and Technology. This is one of Europe's most prestigious grants.

CAPES-PDSE (number BEX14601/13-3). *From May 2014 to May 2015.* Funded by the Brazilian Ministry of Science and Technology to carry out part of my Ph.D. research at TU Munich.

CAPES-DS, Programa de Demanda Social. *From March 2012 to March 2014, and from June 2015 to February 2016.* Funded by the Brazilian Ministry of Science and Technology to carry out Ph.D. research at the University of Sao Paulo.

PRPG-USP Travel Grant. *From October 2013 to November 2013.* Funds of the University of Sao Paulo to cover expenses during a one month-long research stay at TU Munich.

IEEE Signal Processing Society Travel Grant. *May 2013.* IEEE grant to support student's travel expenses to attend the ICASSP 2013 in Vancouver, Canada.

PAE-USP. *From February to June 2013.* Funds of the University of Sao Paulo to support my activities as a Graduate Teaching Assistant.

PAE-USP. *From July to November 2012.* Funds of the University of Sao Paulo to support my activities as a Graduate Teaching Assistant.

IEEE Signal Processing Society Travel Grant. *March 2012.* IEEE grant to support student's travel expenses to attend the ICASSP 2012 in Kyoto, Japan.

PRPG-USP Travel grant. *May 2011.* Funds of the University of Sao Paulo to cover the travel expenses to attend the ICASSP 2011 conference.

Projects and Collaborative Networks

July 2016 – on course — OpenGA.org - Open-source Geometric Algebra (OpenGA) is a hub for tools and algorithms devised in light of Geometric (Clifford) Algebra (GA). This website was first released as a complementary material to my doctoral dissertation. GA encompasses many of the standard algebraic systems used for describing geometric transformations, e.g., linear/matrix algebra, complex algebra, quaternions etc. GA-based algorithms benefit from the intrinsic mathematical generality of GA. OpenGA is for researchers, engineers, and developers willing to apply GA in their projects.

Apr. 2016 to Jan. 2017 — INtelligent, Fast, Interconnected and Efficient devices for Frontier Exploitation in Research and Industry (INFIERI) - INFIERI is a multi and inter-disciplinary European ITN project (FP7-PEOPLE-2012-ITN, PITN-GA-2012-317446-INFIERI, February 2013-January 2017), to train young physicists and engineers in the new domain of intelligent devices and tools for frontier applications in Astrophysics, Particle and Medical Physics, and Telecommunications. The network comprises 5 academics, 4 European laboratories, and 2 companies (Philips and Thales) as full partners, all leading, in their respective fields. Associated partners in Europe (CERN, and some leading companies and Universities), the USA (Fermilab) and Korea (Seoul University and Samsung) bring advanced and complementary technical capabilities. INFIERI awarded me with a Marie Curie Research Fellowship to carry out postdoctoral research at Thales.

Journal Referee

Started 2016 — **IEEE Signal Processing Letters**.

Started 2017 — **Autonomous Robots, Springer**.