



# Wilder Lopes

Ph.D. - AI Consultant, Entrepreneur

Building new ways to scale computation. Obsessing over a vision for the future of computation where geometry is not taken for granted, becoming the third pillar, together with software and hardware, of computer design. Experienced entrepreneur with successful exit (co-founder of upstride.io, acquired by ContentSquare in 2021).

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## SKILLS

R&D   Signal Processing   Machine Learning   Deep Learning   Geometric (Clifford) Algebras   Adaptive Filtering

Entrepreneurship   Leadership   Project Management   Long-term vision   Public Speaking   Python   C++   Cuda

Docker   Cloud development   High Performance Computing   Verilog   FPGAs   Embedded Systems   IC Design

## WORK EXPERIENCE

### Chief Architect (Machine Learning) - contract

Permion - [permion.ai](https://permion.ai)

09/2021 - Present

Vienna, VA - United States (remote from Tulsa, OK)

Permion builds a **neurosymbolic computational engine** that merges logical reasoning and statistical learning for next-generation AI infrastructure.

Achievements/Tasks

- **Leading the R&D team** (6 engineers, of which 3 Ph.D.s) to integrate deep-learning algorithms (**large-language models** and **graph neural networks**) with **knowledge graphs**. Using Pytorch and Nvidia stack.
- **Leading the release of MVPs**, including an AI service to predict the toxicity level of molecules.
- **Managing the interaction between R&D** (scientists) **and production** (software engineers) teams to quickly turn discoveries into product features. Both teams comprise a total of 11 engineers.
- **Scaling the MLOps pipeline** to enable use of **Linux containers** by the R&D team at all phases of development, targeting the deployment in multiple platforms (cloud/on-premises servers & embedded devices). Using Docker and Ogre.run (see below).
- **Building and executing the neurosymbolic product roadmap** to vertically integrate the machine-learning software stack with the logical-reasoning stack. **Designing tech/product pitch decks** for investors and clients; **Training sales personnel** on efficient technology communication.

### Founder / Lead developer

Ogre.run - code once, run anywhere

08/2022 - Present

Tulsa, OK - United States

Ogre is a metacompiler that enable running code in any computational environment.

Achievements/Tasks

- **Ogre speeds up the journey from code to functional prototype** by removing the need for developers to install the code dependencies manually, especially when working with third-party code bases, which are usually tuned for systems/environments different from the developer's.
- Our team is **fine-tuning large-language models (LLMs)** that sit at the core of the Ogre engine. To support that, we are **building a custom database of source code and their hardware/software dependencies**.
- We are **setting up partnerships with AI hardware makers** such as Nvidia and Tenstorrent to optimize Ogre execution.
- **I lead the team of 4 developers** (2 research engineers working on LLMs and AI hardware; 1 full-stack software engineer).

### Founder / Chief Architect

Ogarantia (Consulting in Artificial-Intelligence) - [ogarantia.com](https://ogarantia.com)

08/2021 - Present

Paris, France

Ogarantia closes the gap between groundbreaking mathematical techniques and algorithm design to enable the deployment of robust AI in production.

Achievements/Tasks

- Designing **projects and solutions for AI-driven companies**, such as BMW.
- Selling **custom AI systems**, ready to be deployed in multiple platforms.
- **Supporting open-source projects** for quick deployment of machine-learning systems (ogre.run) and advancing design of Clifford-Algebra neural networks (OpenGA.org)

## WORK EXPERIENCE

### Co-founder and CTO

Upstride (acquired by ContentSquare) - [upstride.io](http://upstride.io) 

10/2018 - 07/2021

Upstride built a computational engine based on Clifford algebras to train neural networks while reducing their footprint. Acquired by ContentSquare.

Paris, France

Achievements/Tasks

- **Built and executed the technical vision**, successfully integrating the product within the pipeline used by AI engineers (Tensorflow/Pytorch/C++).
- Together with the founding team, **raised over EUR 3 million**, of which EUR 1.6 million from VC funds and angel investors.
- **Led a team of 11 engineers**, of which 5 PhDs, to bring to production the world's first **Clifford-Algebra Neural Network engine**.
- **Built successful partnerships** with large companies such as **Nvidia, BMW, Microsoft, Google, AWS**.
- **Authored the patent** of the core technology (**Clifford -Algebra computational engine for neural networks**).

### Applied Scientist (Machine Learning)

UCit - [ucit.fr](http://ucit.fr) 

05/2017 - 09/2018

UCit builds machine learning-based software to predict and optimize high-performance computing (HPC) systems.

Paris, France

Achievements/Tasks

- Created the machine-learning **R&D strategy and roadmap**.
- **Designed 3 types of machine-learning algorithms to predict and optimize** the performance of supercomputers via the analysis of their log files (gradient boosting, random forests, convolutional neural nets).
- **Wrote the machine-learning code** for UCit's software suite (PyTorch).

### Research Engineer (Postdoc)

Thales Group - [thalesgroup.com](http://thalesgroup.com) 

04/2016 - 02/2017

Thales is multinational company that designs and builds electrical systems for the aerospace, defense, transportation and security markets.

Palaiseau, France

Achievements/Tasks

- **Designed statistical-learning and machine-learning algorithms** for data partitioning in high-performance computing platforms composed by heterogeneous devices, e.g., CPUs, GPUs, FPGAs, with the goal to reduce power consumption.
- Carried out research to **improve data collection of collision experiments at CERN** and presented it at 4 conferences around the world (Portugal, France, Brazil, USA).
- **Collaborated across teams** (embedded systems and high-performance computing), with a total of 8 engineers/researchers.
- Supported by a **Marie Curie Research Fellowship** (European Research Executive Agency - European Union)

### Analog and Mixed-Signal IC Design Engineer

LSITec - [lsitec.org.br](http://lsitec.org.br) 

02/2009 - 02/2010

LSITec is a spin-off of the University of Sao Paulo that provides custom chip design for several clients around the world.

Sao Paulo, Brazil

Achievements/Tasks

- Joined the company fresh out of college to work on the **design of ASICs for healthcare**.
- As part of a team of 3 engineers, **designed classical analog and mixed-signal blocks**, e.g., digital-to-analog converters (DACs), operational amplifiers, frequency oscillators.
- Assisted the digital IC design team by **programming Verilog modules**.

## EDUCATION

### PhD in Signal Processing and Machine Learning

University of Sao Paulo / TU Munich

2012 - 2016

Sao Paulo, Brazil and Munich, Germany

### MSc in Electronic Systems Engineering

University of Sao Paulo

2010 - 2012

Sao Paulo, Brazil

## SELECT PUBLICATIONS

Journal

### Geometric-Algebra Adaptive Filters

Author(s)

Lopes, Wilder B.; Lopes, Cassio G.

2019

IEEE Transactions on Signal Processing

Journal

### Geometric-Algebra LMS Adaptive Filter and its Application to Rotation Estimation

Author(s)

Lopes, Wilder B.; Al-Nuaimi, Anas; Lopes, Cassio G.

2016

IEEE Signal Processing Letters

## SELECT PUBLICATIONS

*Conference*

### **6DOF Point Cloud Alignment using Geometric Algebra-based Adaptive Filtering**

*Author(s)*

Al-Nuaimi, Anas; Lopes, Wilder B.; Steinbach, Eckehard; Lopes, Cassio

G.

2016

IEEE WACV 2016 - Lake Placid, NY, USA

*Conference*

### **Incremental Combination of RLS and LMS Adaptive Filters in Nonstationary Scenarios**

*Author(s)*

Lopes, Wilder B.; Lopes, Cassio G.

2013

IEEE ICASSP 2013 - Vancouver, Canada

## LANGUAGES

English

*Native or Bilingual Proficiency*

Portuguese

*Native or Bilingual Proficiency*

French

*Full Professional Proficiency*

German

*Professional Working Proficiency*