

# Dimitri Gerin

## Software and Application Engineer

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<https://dgerin.github.io/cv>

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 [Dimitri Gerin](#)

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As a Software Engineer, I have been working on a wide range of projects, for different companies. I always try to work on the most possible innovative projects, that's why I have mostly been working for startup companies. Because I like to interact with hardware, I always try to stick with the low level aspects of each project, from the design of RTL blocks to the software side, even if I decided to fully switch to software for the last few years. I implemented different algorithms, on different kind of architectures like well known Xilins FPGA's, but more recently on the emergent Processing In Memory (PIM) devices, developed by UPMEM. Over the years, I developed a deep understanding of theses different algorithm, architectures and systems. I'm also a crypto-enthusiastic person. I'm fascinated by the blockchain technology in general, and even I am not actively working in this field, I always try to keep informed about the evolution of the main technologies like bitcoin and Ethereum.

## Skills

parallel programming ●●●●

performance optimization ●●●●

Linux device driver ●●●●

Deep Learning ●●●●

RTL Design ●●●●

Quantization ●●●●

## Languages

C ●●●●

C++ ●●●●

Python ●●●●

VHDL ●●●●

## Systems

PIM (Processing in Memory) ●●●●

Linux Kernel ●●●●

x86 ●●●●

PCI express ●●●●

DDR memory ●●●●

Xilinx FPGAs ●●●●

## Frameworks

PyTorch ●●●●

Tensorflow ●●●●

LLVM ●●●●

## Tools

linux perf ●●●●

qemu ●●●●

intel vtune ●●●●

Docker ●●●●

vivado ●●●●

## Professional Experience

2021 - 2023

UPMEM

Paris/Grenoble

## Software and Application Engineer

One part of my job is to develop applications on UPMEM PIM devices to demonstrate the interest of PIM technology in term of performance and energy efficiency. I also work on the development, maintenance and support of the UPMEM PIM SDK, which is a set of tools and libraries to develop applications on UPMEM PIM devices. I am also working on the improvement of the UPMEM PIM device driver, which is a Linux kernel module used to communicate with PIM devices.

PIM Linux Device Driver Parallel Programming PCI express Performance Optimization Deep Learning

## Projects and applications

### HEDGES

[https://github.com/upmem/usecase\\_hedges](https://github.com/upmem/usecase_hedges)

PIM implementation of HEDGES (<https://www.pnas.org/doi/full/10.1073/pnas.2004821117>), error-correcting code for DNA storage.

### genomic compression

Implementation of a novel genomic technique of DNA compression, based on bloom filter, in collaboration with INRIA/IRISA.

### SparseP

[https://github.com/upmem/SparseP/tree/upmem\\_internal](https://github.com/upmem/SparseP/tree/upmem_internal)

Optimization of original SparseP implementation from ETH Zurich. SparseP is a PIM implementation of Sparse Matrix/Vector multiplication (<https://arxiv.org/abs/2201.05072>)

### PIM Embedding

<https://github.com/upmem/PIM-Embedding-Lookup/tree/multicol>

PIM implementation of Pytorch EmbeddingBag Layer

2018 - 2021

## VSORA

Meudon-La-Forêt

## Software Engineer

I mainly focussed on the specification and the implementation of the VSORA Deep Learning Inference library, a library that implements various DL Layers on VSORA DSP Architecture. I also ported various Deep Learning models on VSORA DSP Architecture, and developed a Quantization Aware retraining flow to improve model's precision with Low-Precision quantization. One other part of my job was to maintain the release and CI pipeline.

DeepLearning C++ SystemC

2017 - 2018

## THALES

Gennevilliers

## FPGA Engineer

As a subcontractor, I participated in the development and validation of the physical layer of FO3D, a new military waveform developed by Thales. I focussed myself on the design of the FPGA part of the TX and RX chain. For this, I developed different RTL blocks that implement

signal processing functions.

FPGA Telecom Signal Processing

## Projects

### F03D

FPGA Implementation of the physical layer of the F03D waveform

2014 - 2017

### SIMPULSE

Palaiseau

#### FPGA / Embedded System Engineer

I participated in the development of the FPGA platform. I developed different RTL blocks for different purposes like telecom oriented signal processing functions, device interfaces and CPU co-processors.

RTL Design FPGA Telecom SoC HW/SW Codesign

## Noticable Projects

### European Project

In collaboration with Nokia Bell Labs, implementing an OpenAIR LTE If4p5 Interface, into FPGA, with SImpulse DSP IP

2014

### CEA LETI

Grenoble

#### Intern

Research in MIMO algorithm for advanced (5G,LTE-Advance).

Matlab OFDM 5G

2013

### UNLV

Las Vegas

#### Intern

Participating in the development of an interactive motion based traffic simulator.

C++

## Education

2012 - 2014

**PHELMA, Grenoble-INP (ex ENSERG)**

**Grenoble**

Engineer's Degree in signal processing, electrical engineering and computer science

Signal Processing

Electrical Engineering

Computer Science

2008 - 2010

**CNAM**

**Paris**

Technology Degree (DUT GEII), Graduated as Valedictorian

Electrical Engineering

2005 - 2008

**ETPLM**

**Grenoble**

High school degree (BAC STI GE), with honors (mention très bien)

## Certifications

2021

**Machine Learning**

Coursera/Stanford, Andrew Ng

Logistic Regression

Neural Networks

Recommenders

2022

**Solana Blockchain Developer Bootcamp with Rust + JavaScript**

**Udemy**

SmartContract

Rust

Javascript

Solana

2018

**Xilinx FPGA Certification**

**Xilinx Training Program**

FPGA

Vivado

VHDL

