# Zakaria TEFFAH

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Birth year:   1987
Nationality: French

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## Engineer in Software and Applied Mathematics

I am an experienced professional with sound knowledge in FPGA compilers and formal verification, excited to tackle cutting-edge software problems and ready to engage in new responsibilities in software and hardware engineering.

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## Skills:

**Key skills:**
- 14+ years of experience in computer science, engineering design, software development.
- ~5 years of experience in FPGA compilers.
- Proficient in C/ C++, Python, Bash, Linux
- In-depth knowledge in combinatorial & numerical optimization, mathematical modelling and statistics.
- Experienced in software architecture design.

**Programming & solvers:**
- Advanced level: C/C++, Python, Matlab, Bash, Linux, Minizinc.
  Experienced in: GIT, Microsoft Visual Studio, Visual Studio Code
- Good level: Lean4, TLA+, Z3, SMTBMC, ABC, AIGER

**Languages:**
- English: good skills, both written and oral. C1 Level.
- French: Fluent.
Learned Spanish and Chinese for 1 year, reading knowledge.

## Work experiences:

**February 2021 – December 2025**

- **C++/Python Research and Development Engineer at NanoXplore, Montpellier, France**
- Heuristics based solving the "Multiplier Tiling" Problem for mapping into DSP primitives.
- Recognition of operators and pipe registers for DSP Pattern matching from the netlist.
- Optimization of Arithmetical operators synthesis inside RTL house compiler.
- Bounded Formal verification with SMT solvers in the Symbiyosys tool.
- Tracking of Front-end vhdl/Verilog library for new features and bug fixes.
- Binary decision diagram development for equivalence checking.
- FSM recognition for diagram display.
- Mathematical Study of some components of FPGA architectures.
- Graph and Hypergraph algorithms for microelectronic circuit abstractions.
- Initiation to digital system design and RTL description (VHDL/Verilog).
- DSP block architecture study for use cases in DNNs, CNNs, FFTs and FIRs.
- ModelSim/QuestaSim use for development validations.

**January 2015 - April 2019**

- **Scientific Tools Engineer at Liebherr Aerospace Toulouse, France**
- Algorithm study for fitting heat transfer coefficients with respect to flight tests, in order to improve a prediction model of icing on airplane wings.
- Development of a scientific computation library modeling a roller bearing.
- Development of uncertainties propagation computation of physical quantities dependent on sensor values.

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| **August 2011 - December 2014** | • **Methods & Tools Consultant at Altran technologies, Toulouse, France**<br>- Modeling aerodynamic coefficients with smoothing to solve a system stability problem for Airbus flight simulators.<br>- Achieved to supervise and train interns and newcomers to use the team software product.<br>- Development of a decision support tool that simulates and optimizes aircraft trajectories.<br>- Design of a software architecture based on object-oriented technology and Design Patterns for a trajectory planification tool.<br>- Simulation of a structure-aero multi-physics for the optimization of the wing shapes of the Airbus A30X aircraft. Optimization under constraints with the help of kriging as machine learning.<br>- Reconstruction of local aerodynamic coefficients. Treatment of a reverse problem. |

## Technical point of contacts:

**M. Bastien TALGORN**
- **Qualcomm. Toronto, Canada**
  ✉ : bastientalgorn@fastmail.com     ☎ : (001) 647.269.3152

**M. Vivian Bréguier**
- **NanoXplore, Montpellier, France**
  ✉ : vbreguier@nanoxplore.com     ☎ : (0033) 6.64.70.29.23

**M. Chaka Kone**
- **Arteris IP. Staff Software Engineer. Paris, France**
  ✉ : chakakone93@yahoo.fr   ☎ : (0033) 6.69.02.63.59

## Internships:

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| **February – June 2011** | • **Internship graduation at « Institut des Mécaniques des Fluides » in Toulouse (IMFT), France**. Porous medium study. Development of a finite volume code simulating Biot poro-elastic coupling and its numerical analysis. |
| **June – September 2010** | • **Internship period at Mercator Ocean in Toulouse, France**<br>Generation of oceanic initial conditions in coarse resolution from meso-scale oceanic re-analysis. |
| **July – August 2009** | • **Internship at the Norwegian meteorological institute (met.no) in Oslo, Norway**<br>At the OSI SAF executive, developing and validating the daily ice drift product. |

## Education:

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| **2006 – 2011** | • **Master of Science in Computer science, Mathematics and Modelling**<br>Department of Mathematics<br>Engineering School: **I**nstitut **N**ational des **S**ciences **A**ppliquées (**INSA**), Toulouse, France |

## Interests:

- Traveling and discovering new cultures: England, USA, Norway, Spain, Portugal, Italy, Maldives, Corsica
- Running, Football
- Guitar: ~20 years of practice