

Jérôme Gurhem

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[LinkedIn](#)

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Education

March 2018 - March 2021 **Ph.D. in Computer Science**

Thesis title : Distributed and Parallel Programming Paradigms Using Graphs of Tasks for Post-Petascale Supercomputers
Advisor : Pr. Serge G. Petiton
University of Lille (Lille, France)

September 2014 - September 2017 **Polytech'Lille, Computer Science and Statistics**

Master in Computer Science and Applied Mathematics
University of Lille (Lille, France)

September 2016 - February 2017 **School of Computer Engineering**

Master in Informatics Engineering - Erasmus
Technical University of Madrid (Boadilla del Monte, Spain)

September 2012 - July 2014 **Undergraduate Studies**

Preparatory Classes in Mathematics and Physics: Specific training for competitive entry examinations for the French "Grandes Ecoles"
Lycée Clémenceau (Reims, France)

September 2009 - July 2012 **Scientific Baccalauréat**

Major : Mathematics
Lycée Samuel Beckett (La Ferté-sous-Jouarre, France)

Work Experience

August 2021 - Present **ANEO, Boulogne-Billancourt, France** ; HPC/Cloud Expert Consultant

- [ArmoniK](#) Tech & Research Lead
 - Development from scratch to industrialization
 - Open-Source HTC orchestrator based on Kubernetes and Terraform managing hybrid multi-cloud computations
 - Supervision and formation of trainees
 - Leading a team of about 10 persons
- Technical evaluation and qualification of candidates during recruiting
- Contribute to InterFLOP project which provides a platform to analyze and control floating point calculus behavior

March 2021 - July 2021 **CNRS USR3441 Maison de la simulation, Saclay, France** ; Postdoctoral researcher

- Parallelization of Graph Convolutional Neural Network training and prediction library
- Port MPI+OpenMP implementation of SPMV to A64FX architecture with vectorization
- Performance evaluation on Fugaku

March 2018 - March 2021 **CNRS USR3441 Maison de la simulation, Saclay, France** ; Ph.D. Student

- Research and classification of task based programming paradigms
- Design, implementation and deployment of task based scientific applications on supercomputers
- Experiments with block based direct methods to solve dense linear systems, sparse matrix vector products and Kirchhoff seismic pre-stack depth migration
- Partially supported by TOTAL SA

March 2017 - August 2017 **Parallel programming, CNRS USR3441 Maison de la simulation, Saclay, France** ; Intern

- Testing and programming YML/XMP applications on supercomputers
- Evaluating and analysing performances of several applications
- Studying and prototyping a new parallel version of the Kirchhoff migration

May 2016 - July 2016 **Management Tool Migration, Norman Info, Arras, France** ; Intern

- Use of SCRUM method to organize work
- Organizing training session for the team to master the new tool
- Adjusting the tool to feedbacks gathered during meetings with the team

August 2015 **Sorting, French Tax Office, Saint-Maur-des-Fossés, France** ; Intern

- Understanding the sorting system of a big company
- Managing time efficiently to do all the tasks
- Helping others to be faster in their work

Lecturer

December 2022 - Present **Université de Versailles Saint Quentin - High Performance Master, Guyancourt, France**

- Classes : Numerical calculus
- topics : Iterative methods to solve linear systems, band matrices, Lapack, BLAS
- 12 hours of practical courses

January 2022 - Present **Institut des Sciences et Techniques des Yvelines, Vélizy, France**

- Classes : Advanced Operating Systems
- Topics : Elf format, process scheduling, threading, virtual memory
- Student project: implementing a Shell in C
- Lecture on "Changes in application development brought by Cloud Computing"
- 2 hours lecture + 40 hours of practical courses

March 2018 - June 2018 **Institut des Sciences et Techniques des Yvelines, Vélizy, France**

- Classes : Operating Systems
- Topics : Unix basic commands, bash scripts, C processes
- 60 hours of practical courses

Certificates

December 2021 (expiration : December 2023) **Google Cloud Certified - Professional Cloud Architect**

Technical Skills

Programming Languages : C# (.Net5, .Net6), Python, C, C++, Bash

AWS : S3, EC2, SQS, AmazonMQ, DynamoDB, Elasticache (Redis), EKS, Cloud9

CI/CD : GitHub, Azure Pipelines, Terraform

Containerization : Docker, Kubernetes, Singularity

Courses

25 January - 8 February 2021 (1 d/week) **[ONLINE] Modern Scientific C++ @ MdIS/Idris**

November - December 2020 **[MOOC] Deep Learning (CNAM)**

7 July - 9 September 2020 (2 h/week) **[ONLINE] Kokkos Lecture Series**

18 December 2019 **Introduction to machine learning in Python with Scikit-learn**

4 - 5 July 2019 **Introduction to Parallel Programming with HPX**

12 - 14 June 2019 **CEA-Riken Summer School - Mastering the Arm HPC ecosystem**

23 - 24 April 2018 **Parallel file systems and parallel IO libraries**

Academic Research

Conference Articles

M. Vandromme, **J. Gurhem**, M. Tsuji, S. G. Petiton, and M. Sato, "Scaling the PageRank Algorithm for Very Large Graphs on the Fugaku Supercomputer", Computational Science - ICCS 2022 - 22nd International Conference, London, UK, June 21-23, 2022. [link](#)

J. Gurhem, H. Calandra and S. G. Petiton, "Parallel and Distributed Task-Based Kirchhoff Seismic Pre-Stack Depth Migration Application", in 20th International Symposium on Parallel and Distributed Computing (ISPDC 2021), Cluj-Napoca, Romania. [link](#)

J. Gurhem, M. Vandromme, M. Tsuji, S. G. Petiton, and M. Sato, "Sequences of Sparse Matrix-Vector Multiplication on Fugaku's A64FX processors", EAHPC-2021 - Embracing Arm for High Performance Computing Workshop. [link](#)

J. Gurhem and S. G. Petiton, "A current task-based programming paradigms analysis", in Computational Science - ICCS 2020, V. V. Krzhizhanovskaya, G. Závodszy, M. H. Lees, J. J. Dongarra, P. M. A. Sloot, S. Brissos, and J. Teixeira, Eds., Cham: Springer International Publishing, 2020, pp. 203-216, ISBN: 978-3-030-50426-7. [link](#)

J. Gurhem, M. Tsuji, S. G. Petiton, and M. Sato, "Distributed and Parallel Programming Paradigms on the K computer and a Cluster", in Proceedings of the International Conference on High Performance Computing in Asia-Pacific Region, ser. HPC Asia 2019, Guangzhou, China: ACM, 2019, pp. 9-17, ISBN: 978-1-4503-6632-8. [link](#)

Extended Abstracts

J. Gurhem, H. Calandra and S. G. Petiton, "Task-Based Sparse Matrix Vector Product and Kirchhoff Migration", 2021 Oil & Gas HPC Conference

Talks

S. G. Petiton, **J. Gurhem**, H. Calandra, "A Taxonomy of Distributed and Parallel Languages for High Performance Tasks-Based Multilevel Computing", SIAM Conference on Parallel Processing for Scientific Computing, February 2020, Seattle, U.S.

J. Gurhem, "Distributed and Parallel Programming using Graphs of Tasks with a Scheduler Optimizing Data Migrations", PhD Day 2019 at Maison de la Simulation, June 2019, Saclay, France.

J. Gurhem, "Programming Paradigm and Language Candidates for Extreme Scale Distributed and Parallel Computing", MATHIAS 2018 Computational Science Engineering & Data Science by TOTAL, Oct 2018, Serris, Paris, France.

J. Gurhem, "Distributed and Parallel Dense Block Linear Algebra using YML and XMP", First French-Japanese-German on Programming and Computing for Exascale and Beyond, Embassy of France in Tokyo, April 2017, Tokyo, Japan.

Languages

French : Native language

English : Fluent

Extra-Curricular

Reading (Fantasy, Science-Fiction)

Video Games (Minecraft)

Programming (Minecraft extensions/mods in Java, MOOCs about computer science)