

VINCENT ALBA

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EDUCATION

University of Bordeaux & Inria bordeaux

2022-2025

PhD in Computer Science

Bordeaux, France

- Supervised by Denis Barthou, Amina Guermouche, Marie-Christine Counilh. On the topic: Resource dimensioning for heterogeneous architectures.

University of Bordeaux & Enseirb Matmeca

2020-2022

Master Degree in Computer Science, with Distinction

Bordeaux, France

- Speciality: High performance computing & Data science

University of Bordeaux

2017-2020

Bachelor in Computer Science, with Distinction

Bordeaux, France

EXPERIENCES

Inria bordeaux

2022

Research internship

Bordeaux, France

- Subject: Load balancing and precision analysis for cardiac simulation
- Implemented optimized dynamic load balancing into OpenCARP's ionic model library (Limpet)
- Studied the feasibility of computing OpenCARP's ionic models in low-precision floating-point format using the precision analysis tool Verificarlo

Inria bordeaux

2021

Research internship

Bordeaux, France

- Subject: Generation of parallel codes for cardiac simulation
- Optimized the GPU code generation of the cardiac simulation tool Miokit
- Implemented Multi-GPU and hybrid CPU/GPU code generation in the cardiac simulation tool Miokit

University of Bordeaux - LaBRI

2019

Research internship

Bordeaux, France

- Subject: Mesh repair for 3D printing
- Performed a comparative study of multiple mesh repair tools for 3D printing

PUBLICATIONS

Vincent Alba, Olivier Aumage, Denis Barthou, Marie-Christine Counilh, Amina Guermouche" *Performance portability of generated cardiac simulation kernels through automatic dimensioning and load balancing on heterogeneous nodes*" Journal of Supercomputing, 2025, 81(9), pp.1047

DOI: 10.1007/s11227-025-07510-5

May 2025

Vincent Alba, Olivier Aumage, Denis Barthou, Raphael Colin, Marie-Christine Counilh, Stephane Genaud, Amina Guermouche, Vincent Loechner, Arun Thangamani" *Performance portability of generated cardiac simulation kernels through automatic dimensioning and load balancing on heterogeneous nodes*" PDSEC 2024, May 2024, San Francisco (CA, USA), United States.

DOI: 10.1109/IPDPSW63119.2024.00171

May 2024

CONTRIBUTIONS

- MICROCARD — EuroHPC Project**

Work package 6: Code generation for heterogeneous architecture
- 2022-2024
- Contributed to the development of the open-source cardiac electrophysiology simulation framework OpenCARP.
 - Implemented multi-GPU and CPU-GPU hybrid support for the ionic model kernel code generation.
 - Developed automatic resource tuning to improve performance and portability of generated ionic model kernels on heterogeneous architectures, achieving a geometric mean speedup of 45.3% compared to using all available resources; work led to a journal and workshop publication.
 - Collaborated with an international consortium of researchers and engineers from multiple countries (France, Norway, Italy, Switzerland, Germany, Austria)

TEACHING EXPERIENCE

Audience	Course Title	Type	Year	Hours
Bachelor’s Year 3 Computer Science, University of Bordeaux	Compilers	Lab	2023	32h
1st Year Engineering, Enseirb-Matmeca	Finite Automata and Applications	Lecture	2024	20h
1st Year Engineering, Enseirb-Matmeca	Logic and Proof	Lab	2024 & 2025	28h
1st Year Engineering, Enseirb-Matmeca	Project in Functional Programming	Project	2024 & 2025	50h