

Contact

antoine.chanlock@gmail.com

www.linkedin.com/in/antoine-chan-lock (LinkedIn)

antoine-chan-lock.gitlab.io
(Portfolio)

Top Skills

Biomedical Research

Prototyping

High Performance Computing (HPC)

Languages

Français (Native or Bilingual)

Anglais (Native or Bilingual)

Espagnol (Native or Bilingual)

Chinois (Elementary)

Certifications

Spanish C1 certification (fluent)

TOEIC 960/980 (C1 equivalent - english fluent)

Publications

High-Order Elasticity Interpolants for Microstructure Simulation

Polar Interpolants for Thin-Shell Microstructure Homogenization

Antoine CHAN-LOCK

3D Simulation Scientist - PhD - Physics based engines - Soft deformations and Fluids specialist

Greater Nice Metropolitan Area

Summary

Computer scientist and physics-based simulation researcher with 10+ years of experience developing numerical simulation methods and high-performance scientific software. I write physics simulation engines from scratch, applying novel methods and smart engineering to improve simulation speed and efficiency. During my PhD research, I developed a homogenization method for FEM simulation of microstructured materials (such as cloth or 3D printed materials) reducing the number of vertices from 27k nodes to 400 nodes for a similar result. In my current work, I develop a fluid simulation engine using LBM, IBM and JAX to rapidly identify problematic blood flows in the heart, opening new ways to fight ischemic strokes. I combine numerical methods, ML-assisted pipelines, and high-performance computing to push the boundaries of scientific computing. I have a strong foundation in applied mathematics and hands-on expertise with Python, C++, and FEM. Published at SIGGRAPH Asia and SCA (Computer Graphics Forum). Fluent in French, English, and Spanish. I'm an outdoors person, passionate about sailing, skiing, the sea and the mountains, and exploring the world. Sapere Aude !

Experience

Inria

Research Scientist

January 2026 - Present (9 months)

Greater Nice Metropolitan Area

Computational Cardiology

Heart modelling and numerical simulation for understanding and disease prevention.

Developing a Lattice Boltzmann (LBM) with Immersed Boundary Method (IBM) fluid simulation engine to understand problematic blood flows, and open new ways to fight ischemic strokes.

Part of EPIONE team @INRIA Côte d'Azur

Part of MEDITWIN and RHU TALENT project

European Space Agency (AcriST consulting)
Software Engineering Consultant
April 2025 - January 2026 (10 months)
Greater Nice Metropolitan Area

- Contributed to refactoring and modernizing a large satellite data processing codebase (hundreds of thousands of LOC) using Dask (Python)
- Applied solid engineering practices: modular design, version control, automated testing, CI/CD, documentation, and validation.
- Collaborated in a team of engineers and scientists, maintaining reliability and scalability from workstations to HPC clusters.
- Contributed to the open-sourcing of scientific computing tools for satellite data processing.

Universidad Rey Juan Carlos
Simulation Scientist
September 2019 - April 2025 (5 years 8 months)
Madrid Area, Spain

PhD in Numerical Simulation, part of the TouchDesign project supported by the European Research Council. My research focuses on the development of innovative and efficient computational methods for the simulation of complex structures.

- Developed an AI-assisted simulation engine to predict meta-material behavior, significantly reducing the need for heavy finite element method (FEM) runs.
- Designed and implemented mathematical tools, with publications at SIGGRAPH/Eurographics SCA 2022 and SIGGRAPH Asia 2024.
- Built a complete ML-simulation pipeline, including data generation, JAX/GPU training, precision metrics, and experimental 3D-printed validation.
- Achieved 97% mesh reduction while preserving accuracy, and released the work as open-source software.

Relevant expertise and skills:

- Coarsening methods and homogenization methods for complex materials.
- Modeling of hyperelastic materials (Saint Venant, Neo-Hookean formulations).
- Geometry processing for surfaces and Thin-shell simulations
- Nonlinear solvers: gradient descent, Newton-Raphson, quasi-Newton / BFGS.
- Model reduction techniques for efficient simulations.

- Machine learning methods: regression models, backpropagation, and neural networks.
- Scientific writing and dissemination of research through peer-reviewed publications.

CLO Virtual Fashion Inc.

Research Scientist

June 2023 - September 2023 (4 months)

Madrid, Community of Madrid, Spain

Antoine CHAN-LOCK

Web Developer

January 2017 - September 2019 (2 years 9 months)

Participated in several web development and maintenance projects.

Experience working for restaurant websites, hair saloon, student associations, laboratory web mastering, and private projects.

Skills:

- HTML/CSS
- Django framework
- WordPress
- Javascript
- Docker
- Python environments
- Versioning (Git)
- CI/CD pipelines
- Agile management methods

MSLab

Simulation research intern

April 2019 - August 2019 (5 months)

Madrid

Research and implementation (C++) of numerical methods fastening computations, based on a 2018 SIGGRAPH coarsening simulation paper.

MSLab URJC

Simulation engineering intern

May 2018 - August 2018 (4 months)

Région de Madrid, Espagne

Implemented (in Matlab) efficient and recent methods for simulation in computer graphics, based on coarsening and homogenization consisting in computing displacements of an hyper elastic heterogeneous material more efficiently than classical FEM. Based on a ACM Transactions on Graphics 2009 paper.

INOVERTIS

Structural Analysys engineer

December 2016 - February 2017 (3 months)

Donzère

Made software to calculate beam sizes for structures according to the European rules. Re-coded a numerical analysis program (finite volumes) in C.

Orkyn'

Employé polyvalent

July 2012 - July 2012 (1 month)

Marseille, France

Education

Universidad Rey Juan Carlos

Doctor of Philosophy - PhD, Computer Graphics · (September 2019 - September 2024)

Universitat Politècnica de Catalunya

Master of Engineering - MEng, Numerical Methods for Engineering · (2018 - 2019)

SeaTech, École d'ingénieur

Master of Engineering - MEng, Modélisation et calculs fluide structure · (2016 - 2019)

University of Toulon

Bachelor of Engineering - BE, Engineering Science · (2014 - 2016)

Saint Joseph de la Madeleine, Marseille

Baccalauréat, Sciences spécialité mathématiques · (2014)