

Antoine Chan-Lock, PhD

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PROFILE

Computer scientist and physics-based simulation researcher with 10+ years of experience developing numerical methods and high-performance scientific software. Specialist in soft deformations and fluids, with hands-on expertise in Python, C++, FEM, LBM, JAX, and high-performance computing.

EXPERIENCE

INRIA -- EPIONE | RESEARCH SCIENTIST

Jan 2026 – Present | Sophia Antipolis, France

- Developing a cardiac blood-flow simulation engine combining the Lattice Boltzmann Method (LBM), Immersed Boundary Method (IBM), and JAX.
- Building heart models to rapidly identify pathological flows and support ischemic-stroke prevention as part of the MEDITWIN and RHU TALENT projects.

EUROPEAN SPACE AGENCY CONSULTING (ACRI-ST) | SOFTWARE ENGINEERING CONSULTANT

Apr 2025 – Jan 2026 | Biot, France

- Refactored and modernized a large satellite-data processing codebase with Python and Dask, scaling from workstations to HPC clusters.
- Applied modular design, automated testing, CI/CD, documentation, and validation in a team of engineers and scientists; contributed to open-sourcing scientific tools.

UNIVERSIDAD REY JUAN CARLOS -- MSLAB | SIMULATION SCIENTIST

Sep 2019 – Apr 2025 | Madrid, Spain

- Developed an AI-assisted engine to predict metamaterial behavior, substantially reducing expensive finite-element simulations.
- Designed and implemented mathematical tools published at SIGGRAPH/Eurographics SCA '22 and SIGGRAPH Asia '24.
- Built a complete ML-simulation pipeline: data generation, JAX/GPU training, accuracy metrics, and experimental validation with 3D-printed samples.
- Achieved a 97% mesh reduction while preserving accuracy and released the work as open-source software.

CLO VIRTUAL FASHION | RESEARCH SCIENTIST INTERN

Jun 2023 – Sep 2023 | Madrid, Spain

- Prototyped C++/Python CAD tools for virtual garment creation.
- Transformed CAD and simulation research into functional prototypes.
- Worked with a multidisciplinary team, balancing rapid prototyping with sound engineering practices.

ADDITIONAL ACTIVITIES

Webmaster of MSLab.es

Teaching: FEM, continuum mechanics, C++

Reviewer : SIGGRAPH Asia '24 & '25 ; ACM TOG

EDUCATION

UNIVERSIDAD REY JUAN CARLOS

PHD IN COMPUTER GRAPHICS

2019 – 2024 | Madrid, Spain

Thesis: *Computational Homogenization of Thin-Shell Microstructures*

Focus: numerical coarsening methods for efficient elastic simulations

CIMNE - UPC

MENG IN NUMERICAL METHODS

2018 – 2019 | Barcelona, Spain

Meshless methods, XFEM, discontinuous Galerkin, phase fields, NURBS

SEATECH

MENG IN FLUID-STRUCTURE MODELLING

2016 – 2019 | Toulon, France

Fluid and solid mechanics, FEM, CFD, continuum mechanics

UNIVERSITY OF TOULON

BENG IN ENGINEERING SCIENCE

2014 – 2016 | Toulon, France

Mathematics, physics, and computer science

SKILLS

Programming: C++, Python, MATLAB

Software engineering: CI/CD, automated testing, documentation, Git, Docker

Scientific simulation: FEM, CFD, LBM, IBM, hyperelastic materials, Abaqus

HPC & ML: Dask, OpenMP, JAX, machine learning

3D printing: Stratasys

Web: HTML, CSS, Django

Scientific research and writing

LANGUAGES

French (native), English (fluent, TOEIC 960/980), Spanish (fluent, C1), Chinese (elementary)

REFERENCES

Miguel Otaduy, PhD advisor (URJC – Meta)

Email: miguel.otaduy@urjc.es

Jesús Pérez (Google DeepMind)

Email: jesus.prod@gmail.com