JORIS PARET

Ph.D in computational physics | Machine learning

CONTACT

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ABOUT ME

« My main interests revolve around physics, simulation and computer science. I like to find innovative solutions to complex problems by combining my scientific knowledge with my technical skills in programming and machine learning. »

MAIN SKILLS

- Research
- Physics
- Simulation
- Scientific computing
- Machine learning
- Deep learning

- Python
- C++
- C#
- Fortran
- Unity
- Git
- Docker

- French - *native*
- English - *fluent*
- Spanish - *intermediate*

SOCIAL SKILLS

- Self-reliance
- Critical thinking
- Curiosity
- Communication
- Pedagogy

WORK EXPERIENCE

LAB. CHARLES COULOMB (CNRS – MONTPELLIER UNIVERSITY) — SEP. 2018 – NOV. 2021
PH.D FELLOW

Study of the emergence of local order in disordered materials (supercooled liquids, glasses) using information theory and various machine learning methods such as clustering and dimensionality reduction. 200 hours of teaching in programming and physics.

DPT. OF PHYSICS (MONTRÉAL UNIVERSITY) — FEB. 2018 – AUG. 2018
RESEARCH ASSISTANT

Study of the phonon replica in the electronic structure of a FeSe monolayer on top of a $SrTiO_3$ substrate using Density Function Theory and *ab initio* simulations. Summer school on parallel computing (MPI, OpenMP, CUDA).

LAB. CHARLES COULOMB (CNRS) — JUL. 2017
RESEARCH ASSISTANT

Experiments of Raman scattering and reflectometry of graphene on oxidised silicon with a thickness gradient. Developement of a LabVIEW application for the automation of experimental measures.

LAB. CHARLES COULOMB (CNRS) — JUN. 2016 – JUL. 2016
RESEARCH ASSISTANT

Mechanical exfoliation, transfer and stacking of 2D crystrals into heterostructures. Raman spectroscopy and white-light reflectometry.

LAB. CHARLES COULOMB (CNRS) — JUN. 2015
RESEARCH ASSISTANT

Numerical models and simulations of opinion dynamics on small-world networks.

EDUCATION

LAB. CHARLES COULOMB (CNRS – MONTPELLIER UNIVERSITY) — 2018 - 2021
PH.D IN PHYSICS

Condensed matter physics. Python, Fortran and C++ programming. Software development. Classical molecular dynamics on GPU and CPU. International workshop on « *Machine Learning for Materials Science* ». International summer school on « *Glasses, Jamming and Slow Dynamics* ». Various talks and poster presentations at international scientific events.

FACULTY OF SCIENCES (MONTPELLIER UNIVERSITY) — 2016 - 2018
MASTER IN COMPUTATIONAL PHYSICS

High-performance computing (code optimization, parallel computing). Molecular dynamics (classical and *ab initio*) and Monte Carlo methods. Advanced physics. Programming in C++, MATLAB, Python, Fortran, Java, LabVIEW. SQL database and IT project management.

FACULTY OF SCIENCES (MONTPELLIER UNIVERSITY) — 2013 - 2016
BACHELOR IN THEORETICAL PHYSICS

Fundamentals in solid and fluid dynamics, optics, electromagnetism, thermodynamics, quantum physics, statistical physics, nuclear physics, experimental physics.

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HOBBIES

- Hiking, biking
- Drums, ukulele, banjo, mandolin, saxophone, computer music
- Game development
- 3D modelling and logo design
- Canada, USA, Iceland, Ireland, Scotland, England, Italy, Portugal, Finland, Germany

PUBLICATIONS

- « *Dimensionality reduction of local structure in glassy binary mixtures* », currently under review in The Journal of Chemical Physics (2022)
- « *Hidden order in disordered materials* », Ph.D thesis (2021)
- « *partycls: A Python package for structural clustering* », The Journal of Open Source Software (2021)
- « *Assessing the structural heterogeneity of supercooled liquids through community inference* », The Journal of Chemical Physics [Editor's Pick] (2020)

CERTIFICATIONS

- **Building Deep Learning Models with TensorFlow** | issued by IBM (2022)
- **Deep Neural Networks with PyTorch** | issued by IBM (2022)
- **Deep Learning & Neural Networks with Keras** | issued by IBM (2022)
- **Machine Learning with Python** | issued by IBM (2022)
- **Docker for the Absolute Beginner** | issued by Udemy (2022)
- **Complete C# Unity Game Developer 3D** | issued by Udemy (2021)
- **C++ Programming – From Beginner to Beyond** | issued by Udemy (2021)

PROGRAMMING PROJECTS

hamoco – Real-time mouse control via webcam-recorded hand gestures (2022)
- Available on PyPI (v1.0.1)

Synth Road – A mobile game with synthwave vibes made with Unity (2022)
- Available on the Google Play Store
- Money generated from the optional advertisement is donated to NGOs

partycls – Unsupervised learning of structure in systems of interacting particles (2021)
- Available on PyPI (v1.1.0)
- Published in the Journal of Open Source Software