Joris PARET

Ph.D in Computational Physics | Machine Learning

CONTACT

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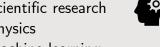
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ABOUT ME

« *My main interests span across physics, machine learning and computer science. I enjoy tackling complex challenges by blending my scientific background with my programming skills.* »
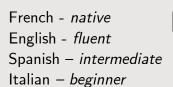
MAIN SKILLS

- Scientific research
- Physics
- Machine learning
- Software development
- Simulation
- Scientific computing

Python
C++
C#
Fortran
Unity
Git
Docker

French - *native*
English - *fluent*
Spanish – *intermediate*
Italian – *beginner*

SOCIAL SKILLS

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

WORK EXPERIENCE

ITER Organization
Postdoctoral Machine Learning Scientist — Feb. 2023 – Present

Exploration of machine learning techniques for improving the calibration of mechanical finite-element models. Development of machine learning approaches for anomaly detection applied to real time machine monitoring. Exploration of Large Language Models techniques for the automated reporting of Tokamak operations.

Lab. Charles Coulomb (CNRS – Montpellier University)
Ph.D Fellow — Sep. 2018 – Nov. 2021

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)
Research Assistant — Feb. 2018 – Aug. 2018

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)
Research Assistant — Jul. 2017

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)
Research Assistant — Jun. 2016 – Jul. 2016

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

Lab. Charles Coulomb (CNRS)
Research Assistant — Jun. 2015

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

EDUCATION

Lab. Charles Coulomb (CNRS – Montpellier University)
Ph.D in Physics — 2018 - 2021

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)
Master in Computational Physics — 2016 - 2018

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.

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HOBBIES

- Climbing, running, hiking
- Drums, ukulele, guitar, mandolin, saxophone, computer music
- Cooking
- Game development
- Logo design
- Canada, USA, Iceland, Ireland, Scotland, England, Italy, Portugal, Finland, Spain, Germany

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Faculty of Sciences (Montpellier University)
Bachelor in Theoretical Physics | 2013 - 2016

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

PUBLICATIONS

- « *Dimensionality reduction of local structure in glassy binary mixtures* », in **The Journal of Chemical Physics** (2022)

- « *Hidden order in disordered materials* », Ph.D thesis (2021)

- « *partycls: A Python package for structural clustering* », in **The Journal of Open Source Software** (2021)

- « *Assessing the structural heterogeneity of supercooled liquids through community inference* », in **The Journal of Chemical Physics** (2020) [Editor's Pick]

CERTIFICATIONS

- **Natural Language Processing in TenforFlow** | issued by DeepLearning.AI (2023)
- **Sequences, Time Series and Predictions** | issued by DeepLearning.AI (2023)
- **Iterative Tools for Data Scientists & Analysts** | issued by Iterative (2023)
- **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)
- **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

- **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)
  - *Official homepage at* jorisparet.com/partycls
  - *Available on* PyPI
  - *Published in the* Journal of Open Source Software