Niels **Faucher**

Computational Physics Graduate | Specializing in AI, Time Series Modeling & Pattern Recognition

About me

I'm a Computational Physics graduate, passionate about physical systems and decision-making algorithms. Sports enthusiast always ready for new challenges.

Areas of specialization

Physics, Numerical Simulation, Solving problem, Reservoir Computing (IA)

Programming

Python ●●●●○
Gfortran ●●●○○
LaTeX ●●●●○
Linux Shell ●●●○○

Languages

French ●●●●●
English - B2 ●●●●○
Italian - A1 ●○○○○

Interests

Physical reservoir computing, physics, nonlinear - system, research, running, ,swimming, calistenics, hiking.

- 26 years old
- French
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- Niels Faucher

Past Working Experience

2025 — **Intern at the Artificial Intelligence Research Center - 5 months**
University of Tokyo · Tokyo, JAPAN 📍
My work at the University of Tokyo focused on **building a numerical model of Physical Reservoir Computing** (PRC) using magnetic skyrmions, and evaluating their computational performance by modulating their helicities.

2024 — **Intern at the Astrophysics departement - 3 months**
University of Zurich · Zurich, SWITZERLAND 📍
I researched the internal structure of Uranus by **developing my own Markov Chain Monte Carlo (MCMC) method** to identify the most accurate models

2019 — **Intern in a research Team - 2 months**
Laboratoire d'Annecy de Physique des Particules · Annecy, FRANCE 📍
As part of the ATLAS project (led by CERN), **I carried out a series of tests on the sensors of the cooling system of the future ATLAS detector** (due to come into service in 2025)

Education

2023-2025 — **Master Computational Physics**
University of Franche-Comté · Besancon, FRANCE 🏛

2021-2023 — **Bachelor Fondamental Physics**
University of Montpellier · Montpellier - FRANCE 🏛

2017-2019 — **University degree in technology**
IUT Savoie Mont-Blanc · Annecy - FRANCE 🏛

Relevant experiences

2024 — **Master 2 - Student Project**
FEMTO-ST Institute · Besancon - FRANCE 📍
I investigated how to synchronize and optimize a optical neural network using the Kuramoto model, enhancing their performance for photonic artificial intelligence through optical injection analysis.

2024 — **Master 1 - Student Project**
Laboratoire UTINAM · Besancon - FRANCE 📍
I analyzed bilateral investments by processing data from the FINFLOWS database to build the World Investment Network (WIN), a complex network mapping global investment flows, where countries are ranked by their investment influence using PageRank and CheiRank.

Future Personal Projects

I plan to continue developing the research project from my internship at the University of Tokyo, with the goal of publishing our findings if the results are promising.

Additionally, I developed a proof of concept (PoC) for Bitcoin price prediction using an Echo State Network (ESN). The project is ongoing, and I'm actively working on improving it. The current version is available on my GitHub.