Contact

Lausanne, Switzerland

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kollerc98@gmail.com

cedric-koller

Personal details

26, single, Swiss citizenship.
Swiss driver's license (type B).

Technical skills

Programming:
- Python
- C/C++
- MATLAB
- Mathematica

Main courses:
- Statistical Physics
- Quantum Physics
- Condensed Matter Physics
- Computational Physics

- Machine Learning
- Deep Learning

Languages

- French: native
- English: C2
- German: C2

Cédric Xavier Koller

Professional Experience and Projects

2023 - present
École Polytechnique Fédérale de Lausanne

PhD Student in Physics

I work at the *Laboratory of Statistical Physics of Computation* under the supervision of Professor Lenka Zdeborová. My research focuses on machine learning theory, constraint satisfaction problems, and dynamical systems. I have also contributed to the creation of and am an assistant for the *Data Science* course, which covers the fundamentals of data analysis and machine learning.

2023
EMS de la Sionge, Vuadens

Civil Service

Assistance to the elderly: breakfast service, group and individual activities. Administration, IT support, and technical service.

2021 - 2022
Laboratory of Statistical Physics of Computation, EPFL

Application of the Cavity Method to Constraint Satisfaction Problems

During my Master's thesis, I studied constraint satisfaction problems on graphs. I applied the cavity method to estimate the number of stationary solutions and identify potential phase transitions, with the aim of finding connections to typical algorithmic complexity. This work was nominated for the Gilbert Hausmann Prize for the best physics thesis.

2020 - 2021
Laboratory of Computational Condensed Matter Physics, EPFL

Machine Learning Applied to Condensed Matter Physics

I applied machine learning techniques for the simulation of various materials. Specifically, I reversed the Slater-Koster relations to approximate the tight-binding model with a reduced number of parameters.

2020 - 2021
Laboratory of Digital and Cognitive Musicology, EPFL

Student Assistant

I participated in the development of a database of annotated musical scores. Tasks: code optimization, score correction, and data management.

Education

2020 - 2022
École Polytechnique Fédérale de Lausanne

Master in Physics

Thesis: "Classification of Outer-Totalistic Cellular Automata based on message passing algorithms".
GPA: 5.72/6.

2017 - 2020
École Polytechnique Fédérale de Lausanne

Bachelor in Physics

Main courses: Advanced Analysis, Advanced Linear Algebra, Probabilities and Statistics, Quantum Physics, Statistical Physics, Solid-State Physics.
Optional courses: Functional Analysis, Biophysics, Computational Physics.

2017 - 2020
Collège du Sud, Bulle

Secondary Diploma

Bilingual diploma (French-German).
Options: Physics and Applied Mathematics, Latin, Music.

Extracurricular Activites

2005 - 2022
Conservatoire de Fribourg

Piano and Musical Theory

I obtained my amateur certificate (the highest attainable non-professional diploma) in 2018. I then continued my piano practice by taking private lessons.

Publications

Cédric Koller, Freya Behrens, and Lenka Zdeborová. *Counting and Hardness-of-Finding Fixed Points in Cellular Automata on Random Graphs*. Journal of Physics A: Mathematical and Theoretical. 2024.