

Youssef KABBABJ

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Motivated and dynamic Master's student in Applied Physics with a passion for innovation and problem-solving. As a fast and eager learner, I thrive in challenging environments, quickly adapting to new concepts and tools. Excited to collaborate with a research team in a flexible and stimulating work environment, on a real-world problem involving biophysics and biotechnologies.

Education

EPFL, Lausanne, Switzerland:

- Master of Science in Applied Physics: 5.72/6 (ongoing) 09/2024-Present
- Bachelor of Science in Physics: 5.69/6 09/2021-07/2024
- Cours de Mathématiques Spécial (CMS): 5.87/6 09/2020-07/2021

Leadership and communication workshops, Dr. Silke Mischke & Pr. Jane Everett, summer 2024.

Groupe Scolaire Atlas, Morocco:

- Baccalaureate of Mathematical Sciences: 18.94/20 07/2020

Technical skills

- Good understanding of classical and quantum molecular dynamics methods.
- Experience in Machine Learning, reinforcement learning, and generative AI.
- Good mastery of mathematical concepts and tools applicable to various scientific fields.
- Strong understanding of statistical physics techniques and their use in modeling tasks.
- Good experience in programming with Python (NumPy, PyTorch, sklearn...), C++, and MATLAB.
- High-level understanding of biological methods and biological chemistry.
- Interdisciplinarity of fields studied: Statistical Physics, Biophysics, Quantum Physics, Solid State Physics... diversity in reasoning skills (modeling problems and adapting algorithms).

Projects and work experiences

Semester Project,

Laboratory of Computational Chemistry and Biochemistry

09/2025-Present

- Learning about molecular dynamics community codes (GROMACS, CP2K, MiMiC...)
- Applying programs to study cases to better bridge QM and MM in the QM/MM simulation approach.

Laboratory of Statistical Biophysics, Summer Internship
Biased generative protein models based on attention DCA

07/2025

- Incorporate additional information in the training model
- Implement generative methods with a chosen bias relative to the new information
- Study the statistical relevance of the generated sequences and the effects of the bias

Semester project,
Generative protein models based on attention DCA

02/2024-06/2025

- Learn the basics of protein models and direct coupling analysis (DCA).
- Use transformer's architecture to infer the necessary parameters.
- Generate new protein sequences using a pseudo-likelihood maximization model.

Semester project,
Investigation of the Alfvén wave continuum in tokamaks

09/2024-01/2025

Swiss Plasma Center, Lausanne
Summer research internship (Summer in the Lab program)

07/2024-09/2024

EPFL, Lausanne
Teaching Assistant (part-time, 10h/week on average)

09/2022-Present

- Understanding the class material on a deeper level to better explain it to the other students.
- Communication skills practice by interacting with many people and adapting to their specific needs.
- Time management skills needed to fulfill my responsibilities without neglecting my classes.

Languages

- English: professional proficiency (C1)
- French: professional proficiency (C1)
- Arabic: mother tongue