Célia Benquet

Software Engineer enthusiastic about neuroscience

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About Me

- **Challenge-driven** and **curious**.
- **Creative** and **critical** thinking.
- Enthusiastic about applying **computational tools** to understand how the brain works.

Programming

Python   Matlab   Java
C++   SQL

Software

MS Office   Google suite
Canva   Latex

Awards

EPFL-WISH Foundation Fellowship

The EPFL-WISH (Women in Science and Humanities) rewards EPFL best female students and support them in their Master's Thesis abroad.

Languages

French	Native
English	Fluent / C1-C2
German	Beginner / A2-B1

Interests

Volunteering

- **Help Refugees and RCK**. Help refugees in Calais (France) by providing food, clothes and every-day necessaries.

Hobbies

- Running, hiking, skiing, scuba-diving: outdoor lover.
- Travelling. Lived in 4 countries since 2016. Visited ~50 countries, more recently Greenland, Canada, Norway, Cuba. Newly-converted slow-traveller.
- Fencing. 10 years in competition (individual and in team).
- Flute. 12 years at the conservatory (chamber music and orchestra).

Education

EPFL — M.Sc. Life Sciences Engineering, Minor in Computational Sciences Engineering
🎓 5.42/6

📅 2019 - 2022   📍 Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Associative Life:

ESN EPFL, Head Of Communication - Member of the Board of Direction. Lead a team of 6 people and handled the social media strategy and visual image of the association.

EPFL — B.Sc. Life Sciences Engineering
🎓 5.05/6

📅 2016 - 2019   📍 Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Academic Exchange (1 year):

Royal Institute of Technology of Stockholm (KTH), Sweden

Associative Life:

Coaching, Treasurer - Integration of first-year students at EPFL. Handled a 3,000 CHF budget.

Work Experience

Research Software Engineer
📅 2022-Present   📍 Geneva, Switzerland

EPFL, Mathis Laboratory of Adaptive Motor Control

Implement new functionalities to CEBRA, a method to map behaviors and neural activity by producing consistent latent spaces. Joint modeling of auxiliary and time-series data, code development, code management and extensions.

Visiting Graduate Student (6 months)
📅 2022   📍 Cambridge, MA, US

Harvard University, Uchida Laboratory

Neural basis of belief state computation in the brain using ML/RL models. Leading my own independent research agenda and corresponding investigations.

R&D Engineer (6 months)
📅 2021-2022   📍 IHU Strasbourg, France

RDS (Rhythm Diagnostic Systems)

*Medical device **start-up**, aiming at bringing to market the first miniaturized and connected wearable medical strip for **real-time monitoring** of several key cardiac and respiratory parameters.*

Normality models to detect noises and anomalies in clinical physiologic signals (ECG and PPG). Data mining, AI/ML models, Riemannian geometry. Part of an AGILE work-environment.

Student Research Assistant
📅 2020-2021   📍 Lausanne, Switzerland

EPFL — Ecole Polytechnique Fédérale de Lausanne (EPFL)

- **Mathis Laboratory of Adaptative Motor Control (6 months):** Discrete Representation of Behaviors in a multi-agent dataset.
- **Herzog Lab - Laboratory of Psychophysics (6 months):** Modeling of Serial Dependency in Visual Perception.
- **Gräff Lab - Laboratory of Neuroepigenetics (6 months):** Functional Mapping of Remote fear memory extinction.

Summer Research Student (1 month)
📅 2019   📍 Cambridge, UK

University of Cambridge

Easy-to-use accessible Matlab-tool to map freezing and vocalizing behaviors when fear or anxiety in rats from experimental video recordings to facilitate behavioral analysis.

Projects

📅 01-07.2021   Discrete Representation of Behaviors in a multi-agent dataset (key-points locations, CalMS21). Usage of deep learning models such as Vector-Quantized Variational AutoEncoder (VQ-VAE).

Herzog Lab - Laboratory of Psychophysics

📅 01-07.2021   Modeling of Serial Dependency in Visual Perception. Human experimentation & data comparison with Bayesian and efficient coding computational models.

Gräff Lab - Laboratory of Neuroepigenetics

📅 01-07.2020   Functional Mapping of Remote fear memory extinction. Hands-on experience with mice brains manipulation and image analysis on QuPath.

Main Courses

Machine Learning   👤 *Prof. Martin Jaggi*

- **Higgs boson detection challenge.** Optimisation and comparison of different ML algorithms for binary classification (LSM, ridge regression and logistic regression).
- **Phenotype classification from High-throughput screening data from the Biomolecular Screening Facility of EPFL.** Comparison of different ML algorithms for multi-class classification (MLP, XGBoost, LGBM, kNN).

⚙️   Python, sklearn, pandas, Google Colab, problem stating.

Deep Learning   👤 *Prof. François Fleuret*

- Comparison and optimization of different neural networks accuracy on classification of the MNIST dataset.
- Implementation of a basic neural network framework, that could be used similarly to the one implemented by Pytorch.

⚙️   Python, Pytorch, neural network optimisation, GitHub.

Image Analysis   👤 *Prof. Jean-Philippe Thiran*

Pattern recognition and classification, based on the MNIST dataset to solve the equation travelled by a robot on a video.

⚙️   Python, classification tools (Pytorch, sklearn), video & image analysis tools (cv2, skimage, …), GitHub.

Intelligent Agents   👤 *Prof. Boi Faltings*

Implementation of a pickup & delivery problem. Different versions using reactive, deliberative, centralised and auctioning agents. Usage of different reinforcement learning algorithms (BFS, A*) and Stochastic Optimisation Algorithm.

⚙️   Java, OOP, reinforcement learning, GitHub.

Applied Data Analysis   👤 *Prof. Robert West*

Analysis of how agriculture shapes the surface of the world, based on the United Nation FAOSTAT dataset. Global evolution of agriculture, compared to global evolution of natural areas surface, correlation for specific foodstuffs to develop a score of sustainability.

⚙️   Python, pandas, data visualisation tools (seaborn, pyplot, …).