

GABRIEL BÉNA

PhD @ Imperial College London
Neuromorphic researcher @ SpiNNCloud

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PERSONNAL STATEMENT

I am a PhD candidate in neuromorphic computing in the Intelligent Systems and Networks group of the Department of Electrical and Electronic Engineering at Imperial College London. I am also working with SpiNNcloud Systems on the latest generation of Spinnaker2 neuromorphic chips. I am a passionate and driven candidate, with strong capabilities and interest in programming and natural sciences.

EXPERIENCE

Neuromorphic Researcher & Developer

SpiNNcloud

- October 2024– Ongoing Freelance / Dresden, Germany
- Designing and deploying deep SNNs on neuromorphic chips. Utilising hybrid approaches to leverage the best of conventional and neuromorphic computing.
- Tackling multiple optimisation and physics problems as neuromorphic applications.
- Active software development and improvement of py-spinnaker2: a high level (python) code interfacing with low-level (C) applications through middle-layer experiment runner (C++) to enable researchers to use Spinnaker2 chips.

PhD Candidate

Imperial College London

- January 2021 – Ongoing London, UK
- PhD in the Neural Reckoning Group under the supervision of Dan Goodman. Goal of the PhD is:
- Study Spiking Neural Networks (SNNs) and uncover principles underlying the spike-based computational paradigm.
- Study the relationship between structure and function in NNs, especially in modular & multimodal architectures.
- Leverage these insights to advance neuromorphic computing as an efficient and sustainable way of creating artificial intelligence.

ML / Neuromorphic Intern

Prophesee

- June 2020 – December 2020 Paris, France
- Trained deep spiking neural networks for event-based cameras, spiking auto-encoders for denoising and compressing tasks
- Worked on end-to-end event-based systems using Intel's LOIHI processor and Prophesee's event-based cameras.

SELECTED PUBLICATIONS

Journal Articles

- G. Béna and D. F. M. Goodman, "Dynamics of specialization in neural modules under resource constraints," *Nature Communications*, Sep. 2024.
- M. Ghosh, G. Béna, V. Bormuth, and D. F. M. Goodman, "Nonlinear fusion is optimal for a wide class of multisensory tasks," *PLOS Computational Biology*, Jul. 2024.

KEY SKILLS

- Proficient in Python, C, Java
- Advanced statistical modelling
- Supervised / Unsupervised Learning, RL.
- Expert knowledge of ANNs / SNNs
- Pytorch, JAX
- Nice guy

EDUCATION

Operational Research master

Université Paul Sabathier

- 2019 – 2020 Toulouse, France
- Master in Operations Research combining applied Mathematics, Informatics and Engineering aiming to provide strong optimization, modelization and algorithmic competencies.
- Ranked 2nd / 29

Master of science

ISAE-Supaero

- 2016 – 2020 Toulouse, France
- Superior Institute of Space and Aeronautics based in Toulouse, ranked 2nd in terms of academic excellence, European leader in aeronautics and space related studies. **Specialization in Data and Decision science (SDD) and Machine Learning** applied to Space Systems Operation and Conception.

MP Preparatory classes

Lycées Henri IV

- 2014 – 2026 Paris, France
- Two-year undergraduate intensive course in mathematics, physics, and computer science preparing a national examination to the top French "Grandes Écoles". **Ranked 301/4800.**

LANGUAGES

French
English
Spanish



INTERESTS / HOBBIES

- Sports:** Skiing, Surf, Rugby: Regular practice and very good level.
- Music:** Saxophone, Guitar.
- Travels:** Morocco (5 years), England (4 years), Japan (6 months), Colombia (6 months).
- Solarpunk**