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"All models are wrong, some are useful."
George Box (1976)

Keywords

Computational neuroscience, neuromorphic computing, AI, spiking neural networks, computer audition, computer vision, electrophysiology

Experience

Research:

- 2022–now **PhD in NeuroAI, CERCO - CNRS UMR 5549, France.**
Modeling of single-unit activity in sensory cortex with deep learning models.
Supervisors: Dr. Benoit Cottureau (DR CNRS) & Dr. Timothée Masquelier (DR CNRS)
- 2021–2022 **PhD in Electronics, IMS - CNRS UMR 5218, France. (Quit)**
FPGA implementation of spiking neural networks for real-time spike sorting of micro-electrode array data
Supervisor: Pr. Timothée Lévi
- 2021 **Academic Research Intern, CERCO CNRS UMR 5549, Toulouse, France.**
Binocular depth regression from event cameras and spiking neural networks.
- 2020 **R&D Intern, Atos - Bull, Grenoble, France.**
Visual object detection and re-identification from surveillance cameras and deep learning.
- 2019–2020 **Academic Research Student, Kohno Lab, Institute of Industrial Studies (IIS), University of Tokyo, Japan.**
Basic computational neuroscience and in-depth discovery of academic research.

Teaching:

- 2024 **Introduction to Spiking Neural Networks, Univ. Paul Sabatier, Toulouse 3, France.**
Introductory course on low-level modeling of the brain with SNNs. Level: M2
- 2021 **Managing an Arduino Project, IUT GEII, Univ. Bordeaux, France.** Teaching 1st year students programming in Arduino, and guiding them on a personal hands-on project of their choice. Level: L1

Education

- 2022–now **PhD in NeuroAI, Univ. Paul Sabatier, Toulouse 3, France.**
- 2021–2022 **PhD in Electronics, Univ. Bordeaux, France. (Quit)**
- 2016–2021 **French Engineering Degree in Electrical Engineering, INSA Lyon, France.**
- 2015–2016 **French Baccalaureate, Lycée St Genès Bordeaux, France.** Advanced mathematics, highest honors.

Miscellaneous

Languages:

- French (Native)
- English (Professional)
- German, Spanish, Japanese (Conversational)

Referee for:

- Neurocomputing
- IEEE Transactions on Neural Networks and Learning Systems

Open Research and Educational Resources


2024 **deepSTRF** |  [urancon/deepSTRF](https://github.com/urancon/deepSTRF)

A Pytorch library for fitting deep neural network models of single and multi-unit sensory neuron recordings with preprocessed datasets and model zoo


Role: Main developer

Conference Talks


2024 **A SNN with plastic delays could provide a mechanistic understanding of V1 responses to dynamic stimuli.**

Queant, A; Goodman, D; Rançon, U; Masquelier, T; Cottureau, BR. Spiking Neural networks as Universal Function Approximators (SNUFA 2024).  Online.

Recurrent neural networks outperform canonical computational models at fitting auditory brain responses.

Rançon, U; Masquelier, T; Cottureau, BR. 33rd Annual Computational Neuroscience Meeting (CNS 2024).  Natal, Brazil.

2021 **StereoSpike: Depth Learning with a Spiking Neural Network.**

Rançon, U; Cottureau, BR; Masquelier, T. Spiking Neural networks as Universal Function Approximators (SNUFA 2021).  Online.

Publications

2025 **Temporal recurrence as a general mechanism to explain neural responses in the auditory system.**

Rançon, U; Masquelier, T; Cottureau, BR. *bioRxiv preprint*. doi:[10.1101/2025.01.08.631909](https://doi.org/10.1101/2025.01.08.631909)

Open science:  [urancon/deepSTRF](https://github.com/urancon/deepSTRF)

2024 **A general model unifying the adaptive, transient and sustained properties of ON and OFF auditory neural responses.**

Rançon, U; Masquelier, T; Cottureau, BR. *PLoS Computational Biology*. doi:[10.1371/journal.pcbi.1012288](https://doi.org/10.1371/journal.pcbi.1012288)

Open science:  [urancon/deepSTRF](https://github.com/urancon/deepSTRF)

2023 **FPGA implementation of a Spiking Neural Network for Real-Time Action Potential and Burst Detection.**

Cheslet, J; Beaubois, R; Rançon, U; Bailly, L; Bernert, M; Kohno, K; Yvert, B; Lévi, T. IEEE Biomedical Circuits and Systems Conference (BioCAS). doi:[10.1109/BioCAS58349.2023.10388622](https://doi.org/10.1109/BioCAS58349.2023.10388622)

Optical flow estimation from event-based cameras and spiking neural networks.

Cuadrado-Anibarro, J; Rançon, U; Barranco, F; Cottureau, BR; Masquelier, T. *Frontiers in Neuroscience*. doi:[10.3389/fnins.2023.1160034](https://doi.org/10.3389/fnins.2023.1160034)

Open science:  [J-Cuadrado/OF_EV_SNN](https://github.com/J-Cuadrado/OF_EV_SNN)

2022 **StereoSpike: Depth Learning With a Spiking Neural Network.**

Rançon, U; Cottureau, BR; Masquelier, T. *IEEE Access*. doi:[10.1109/ACCESS.2022.3226484](https://doi.org/10.1109/ACCESS.2022.3226484)

Open science:  [urancon/StereoSpike](https://github.com/urancon/StereoSpike)