

Florentin GUTH

Postdoctoral researcher in science of deep learning

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📍 New York City

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Experience

Research Fellow

Center for Computational Neuroscience, Flatiron Institute

📅 September 2023–Present

📍 New York, USA

Faculty Fellow

Center for Data Science, New York University

📅 September 2023–Present

📍 New York, USA

Research Intern

Center for Computational Neuroscience, Flatiron Institute

📅 May–August 2022

📍 New York, USA

We developed a multi-scale local conditional probability model of images. **Advisor: Prof. Eero Simoncelli.**

Research Intern

Facebook AI Research

📅 March–August 2018

📍 New York, USA and Paris, France

I developed an AI module for tactical unit movement in the *StarCraft: Brood War* bot *CherryPi/TorchCraft*.

Advisors: Gabriel Synnaeve and Nicolas Usunier.

Education

Ph.D. in Applied Maths and CS

École Normale Supérieure

📅 2019–2023

📍 Paris, France

Thesis title: *Towards a Mathematical Understanding of Deep CNNs.*

Advisor: Prof. Stéphane Mallat.

M.Sc. in Maths, CV and ML (MVA)

École Normale Supérieure Paris-Saclay

📅 2018 – 2019

📍 Paris, France

Advanced courses in mathematics, computer vision and machine learning.

With highest honors, GPA 4.00 (18.27/20).

ENS Diploma

École Normale Supérieure

📅 2016 – 2019

📍 Paris, France

Bachelor- and Master-level courses in computer science and mathematics.

With highest honors, GPA 4.00 (18.17/20).

Classe Préparatoire

Lycée du Parc

📅 2014 – 2016

📍 Lyon, France

Intensive undergraduate courses in mathematics, physics, and computer science.

With highest honors.

National rank: 6th at ENS and 16th at École Polytechnique.

Publications


- Louis Thiry, **Florentin Guth**. *Classification-denoising networks*. Preprint.
- **Florentin Guth**, Brice Ménard. *On the universality of neural encodings in CNNs*. In **Re-Align workshop, ICLR, 2024** and **UniReps workshop, NeurIPS, 2023**.
- Zahra Kadkhodaie, **Florentin Guth**, Eero Simoncelli, Stéphane Mallat. *Generalization in diffusion models arises from geometry-adaptive harmonic representations*. In **ICLR, 2024. Outstanding Paper Award**.
- **Florentin Guth**, Brice Ménard, Gaspar Rochette, Stéphane Mallat. *A Rainbow in Deep Network Black Boxes*. In **JMLR, 2024**.
- **Florentin Guth***, Etienne Lempereur*, Joan Bruna, Stéphane Mallat. *Conditionally Strongly Log-Concave Generative Models*. In **ICML, 2023**.
- Zahra Kadkhodaie, **Florentin Guth**, Stéphane Mallat, Eero Simoncelli. *Learning Multi-Scale Local Conditional Probability Models of Images*. In **ICLR, 2023. "Top 25%"**.
- **Florentin Guth**, Simon Coste, Valentin De Bortoli, Stéphane Mallat. *Wavelet Score-Based Generative Modeling*. In **NeurIPS, 2022**.
- **Florentin Guth**, John Zarka, and Stéphane Mallat. *Phase Collapse in Neural Networks*. In **ICLR, 2022**.
- John Zarka, **Florentin Guth**, and Stéphane Mallat. *Separation and Concentration in Deep Networks*. In **ICLR, 2021**.

Talks

CFM (invited)	📍 Paris, France	📅 09/12/24
Maths and ML Conf., IMSA (invited)	📍 Miami, USA	📅 06/26/24
Youth in High Dimensions, ICTP (invited)	📍 Trieste, Italy	📅 05/23/24
TAG-DS Seminar (invited)	📍 Online	📅 01/30/24
DeepMath Conf.	📍 Baltimore, USA	📅 11/17/23
Keynote and Tutorial, CCN Conf.	📍 Oxford, UK	📅 08/26/23
MALGA Seminar	📍 Genova, Italy	📅 07/17/23
Rough Path Interest Group (invited)	📍 Online	📅 10/05/22
4th IMA Conf. on Big Data	📍 Oxford, UK	📅 09/20/22
Bonner Lab, JHU	📍 Baltimore, USA	📅 07/12/22
MLIA, LIP6, Sorbonne U.	📍 Paris, France	📅 12/09/21
SIERRA, INRIA	📍 Paris, France	📅 11/25/21
3IA Doctoral Workshop	📍 Toulouse, France	📅 11/22/21
DL Theory Seminar, FAIR	📍 Online	📅 11/12/21

Good Programming Practices, Tools and QOL Tricks




CSD, ENS 📍 Paris, France 📅 12/06/21

45-minute tutorial talk about productivity tips at the PhD Seminar of the Center for Science of Data at ENS.
Slides .

Community

Workshop on Scientific Methods for Understanding Deep Learning

NeurIPS 2024 📍 Vancouver, Canada 📅 12/15/24

Co-lead organizer. Around 100 submissions, estimated 700 unique participants (300 peak), > 300 followers on X/Twitter . Website  and videos .

Reviewer

NeurIPS (2023–), ICLR (2024–), JMLR (2024–).

Teaching

CDS Instructor

Center for Data Science, NYU

 2023–2025

 New York, USA


Co-taught DS-GA 1014: Computational Linear Algebra and Optimization” (Master’s level) for Fall 2023 and 2024. Also gave invited lectures in Prof Rajesh Ranganath’s (graduate) and Prof Bruna’s (undergraduate) classes.

Great feedback from students (average satisfaction 4/5).

Maths Teaching Assistant

CPES, PSL

 2020–2023

 Paris, France


Exercise sessions for undergraduate students.

200h of experience. Great feedback from students.

AI Teacher

Ipesup

 2021–2023

 Paris, France

I designed and teach a 24-hour-long introductory course on Artificial Intelligence to high-school students. Topics include the history, applications, limitations, ethical concerns, computational and mathematical aspects of AI, as well as practical programming sessions.

Great feedback from students (average satisfaction of 9/10).

Maths and CS Teacher

Optimal Sup-Spé

 2019–2021

 Paris, France

Classes and exercise sessions for undergraduate students.

More than 200h of experience. Great feedback from students.

Students

- **Sixto Cerna Lopez** (Undergraduate): Implementation of machine learning algorithms for real-estate price estimation.

Outreach

My Personal Experience Doing Research

Collège de France

 Paris, France

 03/22/21



10-minute-long talk about my research topic, why I love research and my background, given to 100 high-school students from underprivileged areas.

How to Create a Programming Language?

Savoirs Pour Tous, ENS

 Paris, France

 11/08/18

1-hour-long wide-audience talk on compilation, aimed at high-school students. Video  and slides  (in French).

More than 17k views and 450 likes on YouTube.