

# Curriculum vitae

Cyrille Rossant

## Researcher and software engineer in neuroscience.

Strong background in **mathematics** and **computer science** as a former student of the École Normale Supérieure, PhD in **neuroscience**, 20+ years of experience in **software development**.

Author of **several books on Python for data science**.

**Specialties:** neuroscience, spiking neural networks, machine learning, signal processing, software engineering, scientific computing, parallel computing, data visualization, Python, NumPy, GPU (CUDA, OpenCL, OpenGL), MATLAB, C#, C++, front-end development (web, mobile, Qt)

## Professional experience

- 2012-now: **Research associate at University College London, Cortical Processing Laboratory** with Kenneth D. Harris. *Spike sorting for large dense arrays.*
- 2009-2012: **PhD at École Normale Supérieure** with Romain Brette. *Correlations in neural coding.*
- 2008: **Undergraduate internship at Princeton University** with Michael Berry. *Statistics of retinal spiking activity.*
- 2007: **Undergraduate internship at the Collège de France** with Alain Berthoz. *Analysis of human locomotor trajectories.*

## Education and diplomas

- 2012: **PhD in neuroinformatics** at the ENS and UPMC with highest honors
- 2008: **Master's Degree in computer science** (MPRI) at the ENS with highest honors
- 2005: **Bachelor's Degree in mathematics** (FIMFA) at the ENS with highest honors
- 2005: Entry to the **École Normale Supérieure** (ENS) through competitive examinations in maths and physics
- 2002: Preparatory classes (MPSI/MP\*) at Lycée Masséna, Nice
- 2002: High school diploma (A-level equivalent) with highest honors

## Teaching

- 2009-2012: **Teacher assistant** in mathematics and computer science at ENS and UPMC (Bachelor and Master levels): probability theory, measure theory, statistics, calculus, real analysis, dynamical systems, signal processing, scientific Python
- 2009-2012: Private lessons in mathematics to students in high school and preparatory classes
- 2008-2009: Voluntary teaching to high school students at TALENS association

## Technical writings

### Books

- **Rossant C** (2015). Learning IPython for Interactive Computing and Data Visualization, second edition. Packt Publishing, 200 pages, ISBN 9781783986989
- **Rossant C** and Klein A (2015). WebGL Insights. CRC Press (chapter of a community book), ISBN 9781498716079
- **Rossant C** (2014). IPython Interactive Computing and Visualization Cookbook. Packt Publishing, 520 pages, ISBN 9781783284818
- **Rossant C** (2013). Learning IPython for Interactive Computing and Data Visualization. Packt Publishing, 138 pages, ISBN 9781782169932

### Articles on O'Reilly Learning

- **Rossant C** (2015). An illustrated introduction to the t-SNE algorithm.

### Articles in Linux Magazine (French edition)

- **Rossant C** (2015). Visualization of large datasets with VisPy. Big Data special issue
- **Rossant C** (2015). Introduction to scikit-learn. Big Data special issue
- **Rossant C** (2014). VisPy: high-performance interactive visualization. Scientific Python special issue

## Publications and conferences

### Articles in international peer-reviewed scientific journals

- **Rossant C, Kadir S, Goodman D, Schulman J, Hunter M, Saleem A, Grosmark A, Belluscio M, Denfield G, Ecker A, Tolia A, Solomon S, Buzsaki G, Carandini M, Harris D.** (2016, joint first authors) Spike sorting for large, dense electrode arrays. **Nature Neuroscience**, 19, 634-641; doi:10.1038/nn.4268
- **Rossant C, Harris KD** (2013). Hardware-accelerated interactive data visualization for neuroscience in Python. **Frontiers in Neuroinformatics**, 7(36); doi:10.3389/fninf.2013.00036
- **Rossant C, Fontaine B, Goodman DF** (2013). Playdoh: a lightweight Python library for distributed computing and optimisation. **Journal of Computational Science**, 4(5): 352-359; doi:10.1016/j.jocs.2011.06.002
- **Rossant C, Fontaine B, Magnusson AK, Brette R** (2012). A calibration-free electrode compensation method. **Journal of Neurophysiology**, 108(9): 2629-2639; doi: 10.1152/jn.01122.2011
- **Rossant C, Leijon S, Magnusson AK, Brette R** (2011). Sensitivity of noisy neurons to coincident inputs. **Journal of Neuroscience**, 31(47): 17193-17206; doi: 10.1523/JNEUROSCI.2482-11.2011
- **Rossant C, Goodman DF, Fontaine B, Platkiewicz J, Magnusson A, Brette B** (2011). Fitting neuron models to spike trains. **Frontiers in Neuroscience**, 5:9. doi:10.3389/fnins.2011.00009
- **Rossant C, Goodman D, Platkiewicz J, Brette R** (2010). Automatic fitting of spiking neuron models to electrophysiological recordings. **Frontiers in Neuroinformatics**, 4:2. doi:10.3389/neuro.11.002.2010

### Dissertations

- **Rossant C**, 2012. Computational role of neural correlations. PhD dissertation.
- **Rossant C**, 2008. Statistics of retinal spiking activity. Master dissertation.

## Conferences

- Hunter M, Goodman D, Kadir S, Steinmetz N, Harris K, **Rossant C** (2015). *phy: a fast, next-generation spike sorting and data analysis framework for high-channel-count electrophysiology*. SfN 2015 (poster)
- Steinmetz N, Burgess C, Kadir S, **Rossant C**, Goodman D, Hunter M, Carandini M, Harris K (2015). *Neural correlates of visually-guided behavior in mouse cingulate cortex*. SfN 2015 (poster)
- Campagnola L, Klein A, Larson E, **Rossant C**, Rougier N (2015). *VisPy: Harnessing The GPU For Fast, High-Level Visualization*. SciPy 2015 (featured talk)
- Steinmetz N, Kadir S, **Rossant C**, Goodman D, Hunter M, Carandini M, Harris K (2015). *Next-generation microelectrode arrays for probing the neocortical circuits underlying visually-guided behavior*. Brain Informatics and Health conference (poster, *best poster award*)
- Kadir S, **Rossant C**, Goodman D, Schulman J, Hunter M, Belluscio M, Buzsaki G, Harris D (2014). Spike sorting for large dense arrays. Society for Neuroscience Annual Meeting, Washington, USA (poster)
- Klein A, Rougier N, **Rossant C**, Larson E, Campagnola L (2014). Introducing VisPy's high level modules: easy yet powerful visualization for everyone. EuroSciPy, Cambridge, UK (talk by Klein A)
- **Rossant C**, Harris K (2013). Spike sorting for large dense electrode arrays: User interface software. Society for Neuroscience Annual Meeting, San Diego, USA (poster)
- **Rossant C** (2013). Spike-based computation in cortical networks: theory and data, Mathematical Neuroscience Laboratory, CIRB, Collège de France, Paris
- Campagnola L, Klein A, **Rossant C**, Rougier N (2013). A Modern and Interactive Visualization Framework, EuroSciPy, Brussels, Belgium (talk by Rougier N)
- **Rossant C**, Harris K (2013). High-performance interactive data visualization in Python. EuroSciPy, Brussels, Belgium (poster)
- **Rossant C**, Harris K (2013). Spike sorting for large dense electrode arrays: User interface software. Organization for Computational Neuroscience Meeting, Paris (poster)
- **Rossant C**, Harris K (2013). Spike sorting for large dense electrode arrays: User interface software. UCL Neuroscience Symposium, London (poster)
- **Rossant C** (2013). Semi-automatic algorithms for manual spike sorting, Cortical Processing Laboratory Seminar, UCL, London
- **Rossant C**, Harris K (2013). Spike sorting for large dense electrode arrays: User interface software. British Neuroscience Association's biennial meeting, London (poster)
- **Rossant C** (2011). Coincidence detection in noisy neurons, Laboratory of Computational Neuroscience Seminar, EPFL, Lausanne, Switzerland
- **Rossant C**, Leijon S, Magnusson AK, Brette R (2011). Sensitivity of noisy neurons to coincident inputs. Workshop on Mean-field methods and multiscale analysis of neuronal populations, CIRM, Marseille, France (poster)
- Brette R, **Rossant C**, Benichoux V (2011). What's new in Brian? Python in Neuroscience Euroscipy Workshop, Paris (talk)
- **Rossant C**, Brette R (2010). Coincidence detection in noisy neurons. Society for Neuroscience Annual Meeting, San Diego, USA (poster)
- **Rossant C**, Brette R (2010). Coincidence detection in noisy neurons. NeuroComp, Lyon, France (poster)
- **Rossant C**, Fontaine B, Goodman DF (2010). Playdoh: a lightweight Python library for distributed computing and optimisation. Euroscipy 2010, Paris (talk)
- **Rossant C**, Brette R (2010). Coincidence detection in active neurons. Cosyne, Salt Lake City, USA (poster)

## Workshops and tutorials

- **Rossant C**, Rougier N, Zaid I, Hunter M (October 2015). VisPy sprint, Collège de France, Paris (organization and participation to the sprint)

- **Rossant C**, Rougier N, Klein A, Campagnola L, Larson E, Zaid I, Hunter M (March 2015). VisPy sprint, Collège de France, Paris (organization and participation to the sprint)
- **Rossant C**, Harris K (2014). File formats for large-scale electrophysiology. Janelia Workshop, Janelia Farm Research Campus, Ashburn, USA (invited talk)
- **Rossant C** (2014). The new interactive features of the IPython 2 notebook, EuroSciPy, Cambridge, UK (advanced tutorial)
- Rougier N, Klein A, **Rossant C** (2014). VisPy sprint, EuroSciPy, Cambridge, UK (sprint)
- **Rossant C**, Rougier N (2014). Scientific Data Visualization, LoOPS network meeting, Orsay University. Presentation and tutorials on HDF5 and VisPy
- **Rossant C**, Klein A, Campagnola L, Rougier N (2014). Organization of the VisPy code camp at the European Synchrotron Radiation Facility (ESRF) in Grenoble
- Rougier N, Klein A, **Rossant C** (2013). Python visualization, EuroSciPy, Brussels, Belgium (sprint)
- Brette R, Stimberg M, Benichoux V, **Rossant C**, Goodman D, Fontaine B (2013). Advanced modelling of spiking neural networks with Brian. Organization for Computational Neuroscience Meeting, Paris (tutorial)
- **Rossant C**, Harris K (2013). Next-generation software for spike sorting with large multi-electrode probes. Janelia Spike Sorting Workshop, Janelia Farm Research Campus, Ashburn, USA (invited talk)

## Grants and awards

- **Research grant** (2014-2015). Cooperation between **Collège de France** and **University College London**, via Paris-Sciences-Lettres (PSL).