Curriculum vitae

Cyrille Rossant

Neuroscience researcher and software engineer at the **International Brain Laboratory** and **University College London** (Institute of Neurology).

- PhD in **neuroscience**
- Strong interest in biomedical and clinical research
- Former student of the **École Normale Supérieure de la rue d'Ulm(mathematics, physics, computer science)**
- Author of **several books on Python for data science**
- 25+ years of experience in **computing** (Python, C, C#, C++, MATLAB, PHP)
- 20 years of experience in **GPU graphics/computing** (CUDA, OpenGL, Vulkan)
- 20 years of experience in **databases** (SQL)
- Front-end development (web, mobile, Qt)

Professional experience

- 2018-now: **Neuroscience researcher and software engineer at the International Brain Laboratory**
- 2012-now: **Research associate at University College London, Institute of Neurology, 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 neuroscience** 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

Publications and conferences

Articles in international peer-reviewed scientific journals

- The International Brain Laboratory, Valeria Aguillon-Rodriguez, Dora Angelaki, Hannah Bayer, Niccolo Bonacchi, Matteo Carandini, Fanny Cazettes, Gaelle Chapuis, Anne K Churchland, Yang Dan, Eric

Dewitt, Mayo Faulkner, Hamish Forrest, Laura Haetzel, Michael Häusser, Sonja B Hofer, Fei Hu, Anup Khanal, Christopher Krasniak, Ines Laranjeira, Zachary F Mainen, Guido Meijer, Nathaniel J Miska, Thomas D Mrsic-Flogel, Masayoshi Murakami, Jean-Paul Noel, Alejandro Pan-Vazquez, **Cyrille Rossant**, Joshua Sanders, Karolina Socha, Rebecca Terry, Anne E Urai, Hernando Vergara, Miles Wells, Christian J Wilson, Ilana B Witten, Lauren E Wool, Anthony M Zador (2021). Standardized and reproducible measurement of decision-making in mice. **eLife**, 10.7554/eLife.63711.

- Zahl SM, Mack JA, **Rossant C**, Squier W, Wester K (2021). Thrombosis is not a marker of bridging vein rupture in infants with alleged abusive head trauma. **Acta Paediatrica**, doi.org/10.1111/apa.15908.
- Rougier NP, Hinsen K, Alexandre F, Arildsen T, Barba LA, Benureau FCY, Brown CT, de Buyl P, Caglayan O, Davison AP, Delsuc M, Detorakis G, Diem AK, Drix D, Enel P, Girard B, Guest O, Hall MG, Henriques RN, Hinaut X, Jaron KS, Khamassi M, Klein A, Manninen T, Marchesi P, McGlinn D, Metzner C, Petchey O, Plesser HE, Poisot T, Ram K, Ram Y, Roesch E, **Rossant C**, Rostami V, Shifman A, Stachelek J, Stimberg M, Stollmeier F, Vaggi F, Viejo G, Vitay J, Vostinar AE, Yurchak R, Zito T. (2017). Sustainable computational science: the ReScience initiative. **PeerJ Computer Science**, 3:e142, doi.org/10.7717/peerj-cs.142
- James J. Jun, Nicholas A. Steinmetz, Joshua H. Siegle, Daniel J. Denman, Marius Bauza, Brian Barbarits, Albert K. Lee, Costas A. Anastassiou, Alexandru Andrei, Çağatay Aydın, Mladen Barbic, Timothy J. Blanche, Vincent Bonin, João Couto, Barundeb Dutta, Sergey L. Gratiy, Diego A. Gutnisky, Michael Häusser, Bill Karsh, Peter Ledochowitsch, Carolina Mora Lopez, Catalin Mitelut, Silke Musa, Michael Okun, Marius Pachitariu, Jan Putzeys, P. Dylan Rich, **Cyrille Rossant**, Wei-lung Sun, Karel Svoboda, Matteo Carandini, Kenneth D. Harris, Christof Koch, John O'Keefe & Timothy D. Harris (2017). Fully integrated silicon probes for high-density recording of neural activity. **Nature**, 551, 232-236; doi:10.1038/nature24636
- **Rossant C, Kadir S**, Goodman D, Schulman J, Hunter M, Saleem A, Grosmark A, Belluscio M, Denfield G, Ecker A, Tolias 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

Articles in international journals

- **Rossant C**, International Brain Laboratory, Rougier N (2021, in press). High-performance interactive scientific visualization with DatoViz via the Vulkan low-level GPU API. **Computing in Science and Engineering**, doi.org/10.1109/MCSE.2021.3078345

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)

Technical writings

Books

- **Rossant C** (2018). IPython Interactive Computing and Visualization Cookbook, Second Edition. Packt Publishing, 548 pages, ISBN 9781785888632
- **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

Grants and awards

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

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