

Pyret: A Python package for analysis of neurophysiology data

Benjamin Naecker $^1$ , Niru Maheswaranathan $^1$ , Surya Ganguli $^2$ ,  $^3$ , and Stephen Baccus $^3$ 

1 Neurosciences Graduate Program, Stanford University 2 Department of Applied Physics, Stanford University 3 Department of Neurobiology, Stanford University

**DOI:** 10.21105/joss.00137

## Software

- Review 🗗
- Repository 🗗
- Archive ♂

## Licence

Authors of JOSS papers retain copyright and release the work under a Creative Commons Attribution 4.0 International License (CC-BY).

## Summary

The pyret package contains tools for analyzing neural electrophysiology data. It focuses on applications in sensory neuroscience, broadly construed as any experiment in which one would like to characterize neural responses to a sensory stimulus. Pyret contains methods for manipulating spike trains (e.g. binning and smoothing), pre-processing experimental stimuli (e.g. resampling), computing spike-triggered averages and ensembles (Schwartz et al. 2006), estimating linear-nonlinear cascade models to predict neural responses to different stimuli (Chichilnisky 2001), part of which follows the scikit-learn API (Pedregosa et al. 2011), as well as a suite of visualization tools for all the above. We designed pyret to be simple, robust, and efficient with broad applicability across a range of sensory neuroscience analyses.

Full API documentation and a short tutorial can be found at http://pyret.readthedocs.io/

## References

Chichilnisky, EJ. 2001. "A Simple White Noise Analysis of Neuronal Light Responses." *Network: Computation in Neural Systems* 12 (2). Taylor & Francis: 199–213.

Pedregosa, Fabian, Gaël Varoquaux, Alexandre Gramfort, Vincent Michel, Bertrand Thirion, Olivier Grisel, Mathieu Blondel, et al. 2011. "Scikit-Learn: Machine Learning in Python." *Journal of Machine Learning Research* 12 (Oct): 2825–30.

Schwartz, Odelia, Jonathan W Pillow, Nicole C Rust, and Eero P Simoncelli. 2006. "Spike-Triggered Neural Characterization." *Journal of Vision* 6 (4). The Association for Research in Vision; Ophthalmology: 13–13.