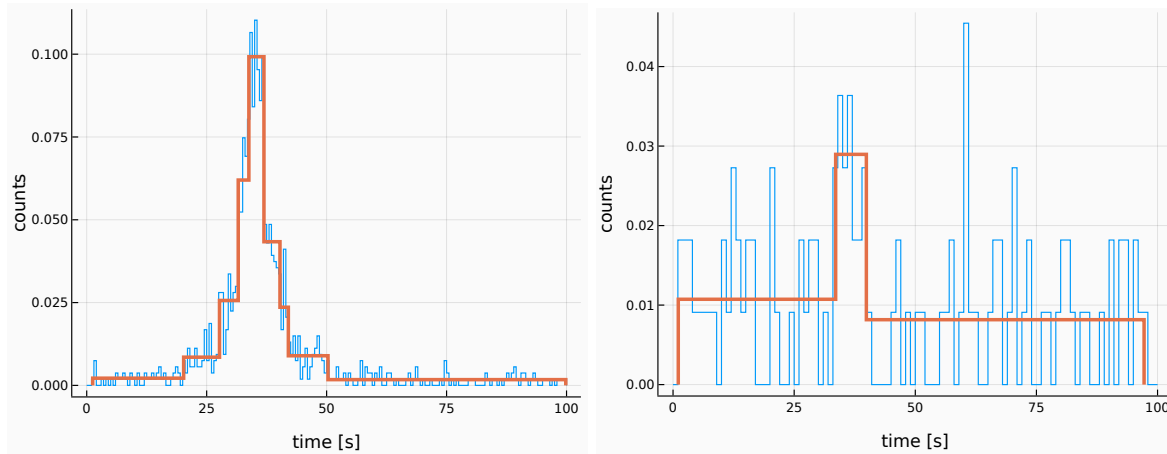


Bayesian Blocks: an algorithm for histogram representation

It is a non-parametric representation of data derived with a bayesian statistical procedure. It has been invented by D. Scargle [1] and applied in the context of astronomical time series analysis. A similar technique available on the market is the kernel density estimation (KDE). As described in [2], it allows to discover local struture in background data, exploiting the full information brought by the data. The main idea is based on segmentation of the data interval into variable-sized blocks, each containing consecutive data satisfying some well defined criteria.



See here [4] for an implementation of the algorithm in Julia.

Write an algorithm in R and then test its performances with different sets of data.

Try to think other possible application of the method.

Bibliography

- [1] J. D. Scargle *et al.*, *Astrophys. J.* **764** (2013) 167
- [2] B. Pollack *et al.*, arXiv:1708.00810
- [3] J. D. Scargle *et al.*, *Astrophys. J.* **504** (1998) 405
- [4] L. Pertoldi, *The Bayesian Blocks algorithm from time series analysis to histogram representation*, GERDA meeting presentation, 2018. Available here: https://www.pd.infn.it/~agarfa/didattica/lpertoldi_bayesian-blocks.pdf