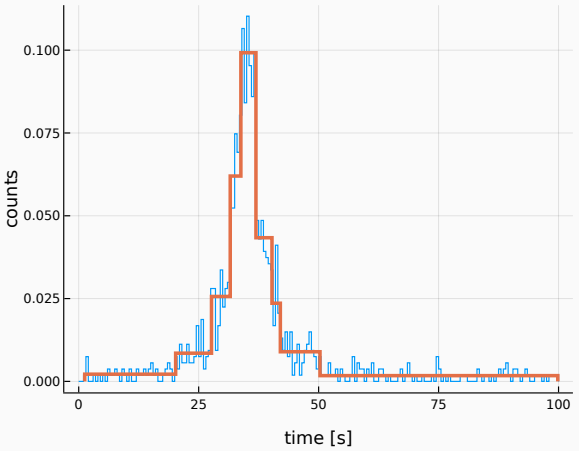
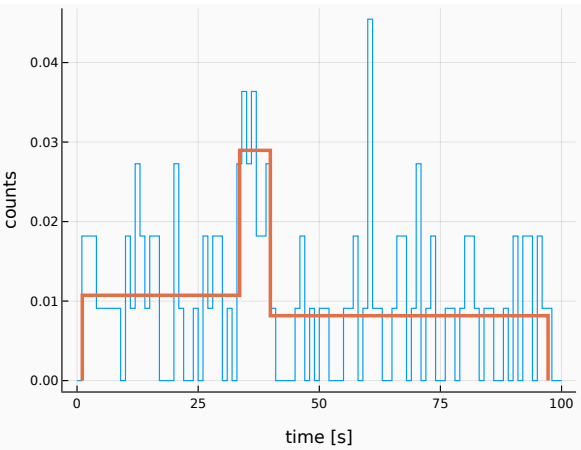
Bayesian Blocks: an algorithm for histogram representation

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.

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/AdvStat/ex_projects/P05/lpertoldi_bbpres.pdf`