`snmachine`: SN classification with ML

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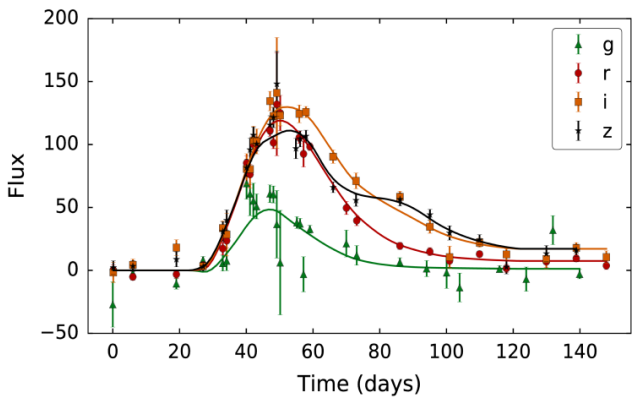
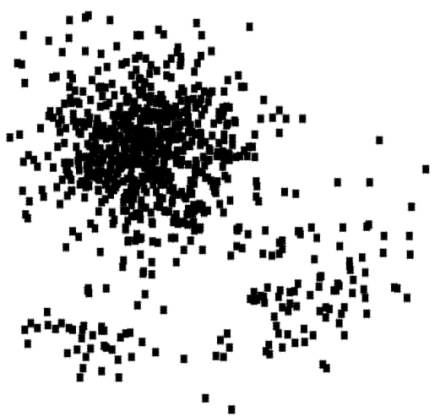
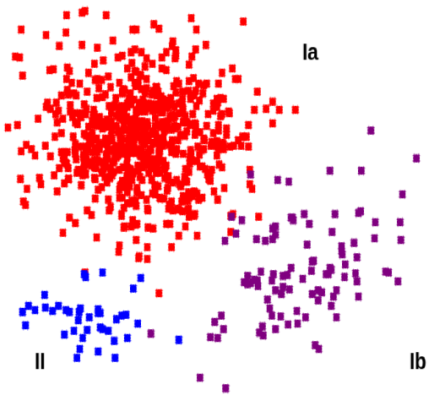
The snmachine pipeline

Lochner et al (arxiv.org/abs/1603.00882)







Feature selection

Available features:

- template fitting (SALT2)
- parametric light curve models
  - Newling et al
  - Karpenka et al
- wavelets

Available fitting methods

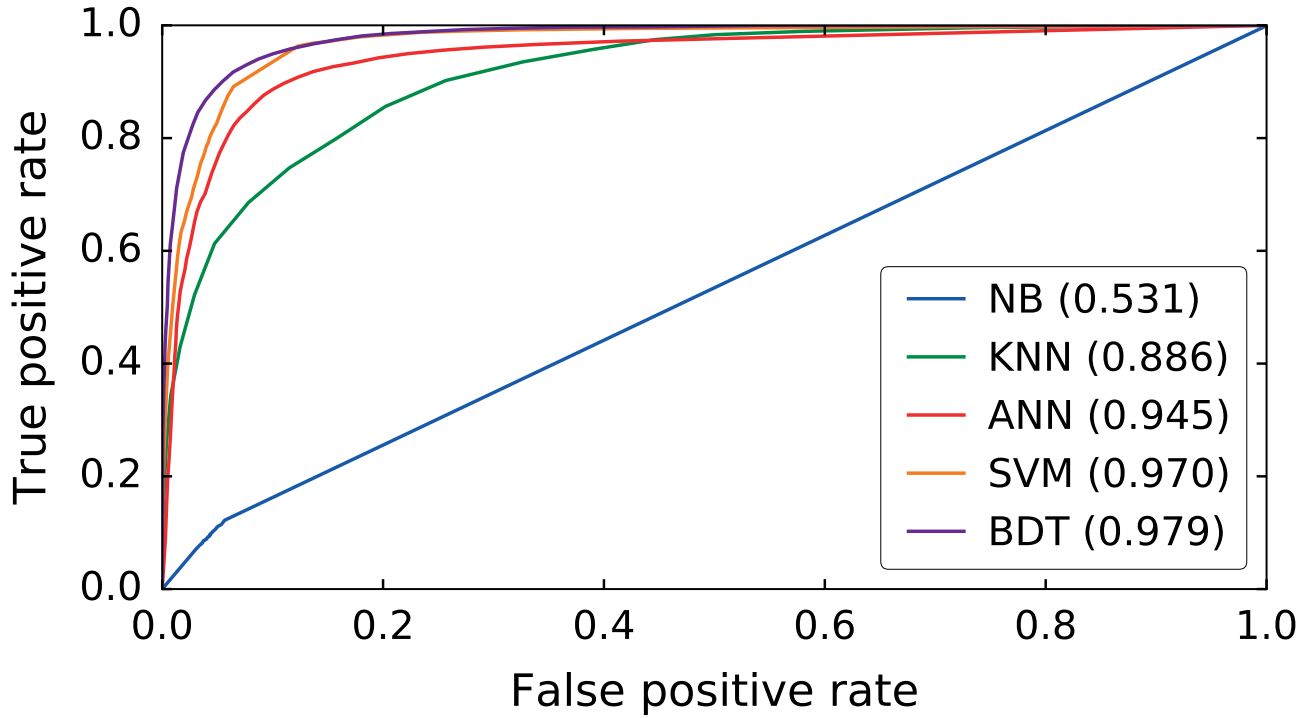
- least squares
- MCMC (`emcee`)
- nested sampling (`multinest`)

Machine learning algorithms

Available classifiers:

- naive Bayes
- *k*-nearest neighbours
- artificial neural networks
- support vector machines
- boosted decision trees

performance metric: ROC curves



$$\text{True positive rate} = \frac{\text{true positives}}{\text{true positives} + \text{false negatives}}$$

$$\text{False positive rate} = \frac{\text{false positives}}{\text{false positives} + \text{true negatives}}$$

Installation

Follow instructions on the github repo:
`github.com/DarkEnergyScienceCollaboration/snmachine`

Mind the caveat for tcsh!

Tutorial: jupyter notebook in
`snmachine/examples/examples_spcc.ipynb`