## Variable object classification for the third Gaia Data Release (DR3)

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## Preparation

- Crossmatching
  - ▶>150 catalogs
  - ► ~8 M sources
  - ► ~100 (sub) types
  - based on positional and magnitude difference
- Training set for General Variability Detection ▶ 2 types: 60 K 'variables' and 63 K 'others'
- Training set for General classification
  - ▶ 40 type groups: 60 K variables

## Execution

- Classifier framework H2O (www.h2o.ai)
- General Variability Detection
  - ➤ XGBoost: binary classifier
  - ► Completeness: 99%
  - ► Contamination in variables: 0.4%
- General classification
  - ► About 100 one-vs-rest classifiers *for each variable type* using XGBoost (XGB) and Distributed RandomForest (DRF).
  - ▶ Several multi-class classifiers using XGB and DRF.
  - Several DRF meta-classifiers combining the one-vs-rest or multi-class classifier results.

Compact companions







