AutoGluon v0.8 Cheat Sheet

Installation

AutoGluon (GitHub) requires pip > 1.4 (upgrade by `pip install -U pip`). More installation options. AutoGluon v0.7 supports Python 3.8 to 3.10. Installation is available for Linux, MacOS, and Windows.

```
pip install autogluon
```

Preparing Data

AutoGluon accepts DataFrames as inputs, where each row stores an example, while a column presents a feature. Here we use the Kaggle Titanic dataset to demonstrate how to use AutoGluon.

```
import pandas as pd
train_data = pd.read_csv('titanic/train.csv')

from autogluon.tabular import TabularDataset
train_data = TabularDataset('titanic/train.csv')
# it's also a Pandas DataFrame but with additional methods
```

Little data preprocessing, such as removing obvious non-predictive columns, is needed for AutoGluon.

```
train_data = train_data.drop(columns=['PassengerId'])
```

Training

Train models to predict the values in the column 'Survived'. The training log will tell you how AutoGluon extracts features, selects, trains and ensembles models.

```
from autogluon.tabular import TabularPredictor

predictor =
TabularPredictor(label='Survived').fit(train_data)
```

More options to construct a **TabularPredictor** instance (docs):

```
verbosity=3 # More training log.
# The metric used to tune models. All available metrics.
eval_metric='roc_auc'
```

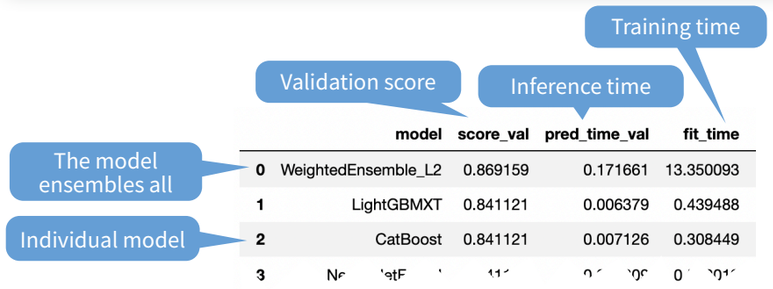
More options for the **fit** method (docs):

```
# Limit the training time, in second
time_limit=600
# Better model ensemble for a better accuracy, but
longer training time. All available options.
presets='best_quality'
# Use a separate dataset to tune models.
tuning_data=val_data
# Explore less models. You can fully control the model
search space. All available options.
hyperparameters='very_light'
# Ignore some models.
excluded_model_types=['KNN', 'NN_TORCH']
```

Monitoring

Understand the contribution of each model.

```
predictor.leaderboard()
```

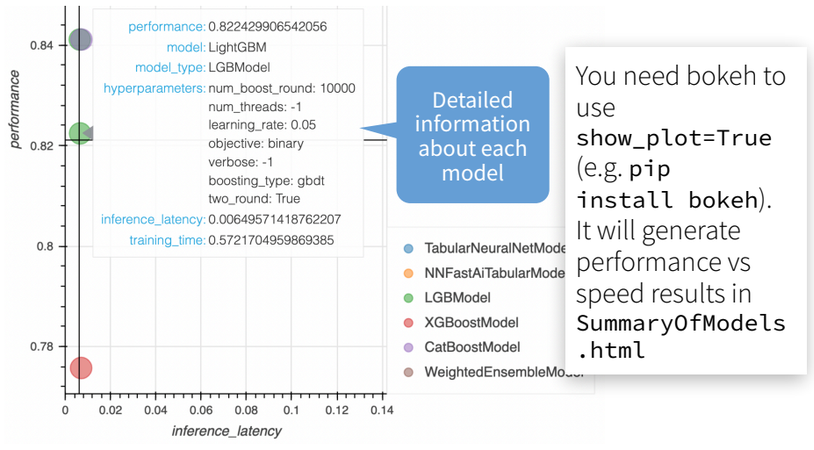


More options for `leaderboard`:

```
silent=True # Recommend when using Jupyter.
# Report metrics on a separate test dataset.
data=test_data
# Evaluate more metrics.
extra_metrics=['accuracy','log_loss']
```

Understand more about the trained models.

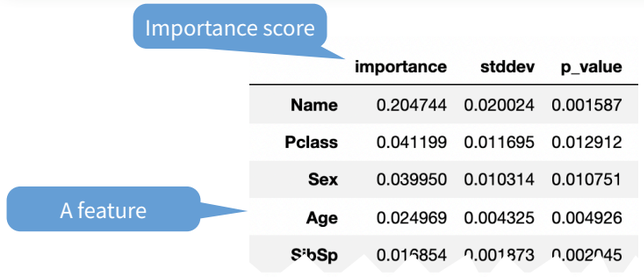
```
predictor.fit_summary(show_plot=True)
```



You need bokeh to use `show_plot=True` (e.g. `pip install bokeh`). It will generate performance vs speed results in `SummaryOfModels.html`

Understand the importance of each feature.

```
predictor.feature_importance(test_data)
```



Predicting

```
test_data = TabularDataset('test.csv')
# Predict for each row
predictor.predict(test_data)
# Return the class probabilities for classification
predictor.predict_proba(test_data)
# Evaluate various metrics, it needs test_data to have
the label column
predictor.evaluate(test_data)
```

AutoGluon predicts with the final ensemble model. You can also predict using an individual model.

```
# Get a list of string names
models = predictor.get_model_names()
# Predict with the 2nd model. Both predict_proba and
evaluate also accept the model argument
predictor.predict(test_data, model=models[1])
```

Deploying

AutoGluon models are saved to disk automatically. You can check log to find where it saves, or get the path by `predictor.path`.

```
# Load saved model from disk.
predictor = TabularPredictor.load('AutogluonModels/
ag-20220129_004130/')
```

If the inference speed matters, there are multiple ways to accelerate the speed. First, you can force all models in memory.

```
predictor.persist_models()
```

During training, you can use presets for the `fit` method optimized for fast inference (though may hurt model performance).

```
presets=['good_quality', 'optimize_for_deployment']
```

Alternatively, you can distill the ensemble into a single model.

```
# Get the list of names of the distilled models.
students = predictor.distill()
# Evaluate the 3rd distilled model.
predictor.evaluate(test_data, model=students[2])
```

Results on Titanic. Accuracy 83.8% → 84.5%, evaluation time 82ms → 49ms. Here the distilled model even has a better accuracy.

- Click here for detailed Tabular tutorials.
- For data involving text and images, try out MultiModalPredictor.
- Check the latest version of this cheat sheet at https://auto.gluon.ai/stable/cheatsheet.html
- Any questions? Ask here
- Like what you see? Consider starring AutoGluon on GitHub and following us on twitter to get notified of the latest updates!