03-hyperparameters-tuning

December 17, 2021

```python
[4]: from sklearn.model_selection import GridSearchCV
     from sklearn.svm import SVC, NuSVC
     from sklearn.neural_network import MLPClassifier
     from sklearn.discriminant_analysis import LinearDiscriminantAnalysis
     from sklearn.kernel_ridge import KernelRidge
     from sklearn.linear_model import LogisticRegression
     from utils import load_run
     from itertools import repeat
     import numpy as np

     run = load_run('1639482648')

     df = run['data']
     scaler = run['scaler']
     pca = run['pca']

     y = df['word'].to_numpy()
     X = df.filter(regex='pixel.+').to_numpy()
     X = scaler.transform(X)
     X = pca.transform(X)

     grid = GridSearchCV(
         estimator=LogisticRegression(dual=False, max_iter=10000),
         param_grid={
             'C': [1e-04, 1e-03, 1e-02, .1, 1, 10],
             'tol': [1e-07, 1e-06, 1e-05, 1e-04, 1e-03, 1e-02, .1]
         },
         refit=True,
         verbose=2,
         n_jobs=-1
     )

     grid.fit(X,y)

     print('Best hyperparameters:', grid.best_params_)
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Fitting 5 folds for each of 42 candidates, totalling 210 fits
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Best hyperparameters: {'C': 0.01, 'tol': 1e-07}
```

1 SVC

- small-ish dataset: C=2.5, gamma=0.0001105

2 MLPClassifier

- hidden_layer_sizes=tuple(repeat(int(pca.n_components_ * 1.2), 3)), alpha=1e-07

3 NuSVC

- NuSVC(nu=1e-07, tol=1e-09)

4 LinearDiscriminantAnalysis

- LinearDiscriminantAnalysis(tol=1e-06)

5 LinearRegression

- 'C': 0.01, 'tol': 1e-07