How to save and load Random Forest from Scikit-Learn in Python?

June 24, 2020 by Piotr Płoński **Random forest**

In this post I will show you how to save and load Random Forest model trained with scikit-learn in Python. The method presented here can be applied to any algorithm from sckit-learn (this is amazing about scikit-learn!).

Additionally, I will show you, how to compress the model and get smaller file.

For saving and loading I will be using `joblib` package.

Let's load scikit-learn and joblib

```
import os
import joblib
import numpy as np
from sklearn.datasets import load_iris
from sklearn.ensemble import RandomForestClassifier
```

Create some dataset (I will use Iris dataset which is built-in in sklearn):

```
iris = load_iris()
X = iris.data
y = iris.target
```

Train the Random Forest classifier:

```
rf = RandomForestClassifier()
```

```
rf.predict(X)
```

```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2])
```

Let’s save the Random Forest. I’m using `joblib.dump` method. The first argument of the method is variable with the model. The second argument is the path and the file name where the resulting file will be created.

```
# save
joblib.dump(rf, "./random_forest.joblib")
```

To load the model back I use `joblib.load` method. It takes as argument the path and file name. I will load the forest to new variable `loaded_rf`. Please notice that I don’t need to initilize this variable, just load the model into it.

```
# load, no need to initialize the loaded_rf
loaded_rf = joblib.load("./random_forest.joblib")
```

Let’s check if it works, by computing predictions, they should be exactly the same as from the `rf` model.

```
loaded_rf.predict(X)
```

```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2])
```

They are the same. We successfully save and loaded back the Random Forest.

Extra tip for saving the Scikit-Learn Random

parameter to save the disk space. In the joblib docs there is information that `compress=3` is a good compromise between size and speed. Example below:

```
joblib.dump(rf, "RF_uncompressed.joblib", compress=0)
print(f"Uncompressed Random Forest: {np.round(os.path.getsize('RF_

>>> Uncompressed Random Forest: 0.17 MB
```

```
joblib.dump(rf, "RF_compressed.joblib", compress=3)  # compression
print(f"Compressed Random Forest: {np.round(os.path.getsize('RF_co

>>> Compressed Random Forest: 0.03 MB
```

Compressed Random Forest is `5.6` times smaller! The compression can be used to any sckit-learn model (sklearn is amazing!).

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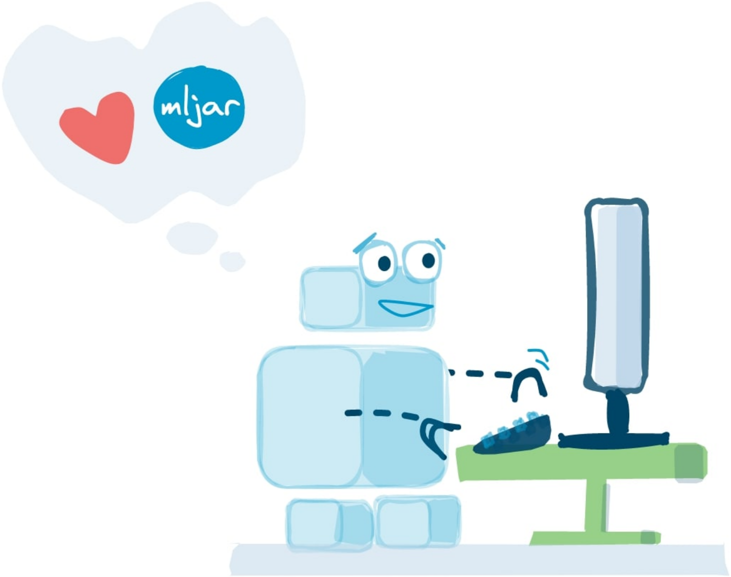

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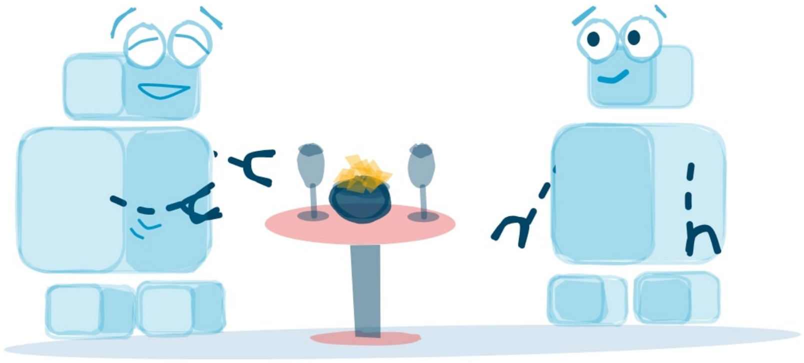

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