Experiment 8 - Isolated Random Forests

April 28, 2023

1 Experiment Details

1.1 Submitted By

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[ ]:
```
# Import required libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.datasets import make_moons
from sklearn.ensemble import IsolationForest
```

```
/home/volt/.local/lib/python3.10/site-packages/scipy/__init__.py:146:
UserWarning: A NumPy version >=1.16.5 and <1.23.0 is required for this version
of SciPy (detected version 1.24.3
  warnings.warn(f"A NumPy version >={np_minversion} and <{np_maxversion}"
```

[ ]:
```
# Generate moon-shaped data
X, _ = make_moons(n_samples=1000, noise=0.05, random_state=42)
```

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```
# Fit the Isolation Forest model
model = IsolationForest(n_estimators=100, max_samples='auto', contamination=0.
↪1, random_state=42)
model.fit(X)
```

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```
IsolationForest(contamination=0.1, random_state=42)
```

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```
# Predict the anomaly scores
scores = model.decision_function(X)
```

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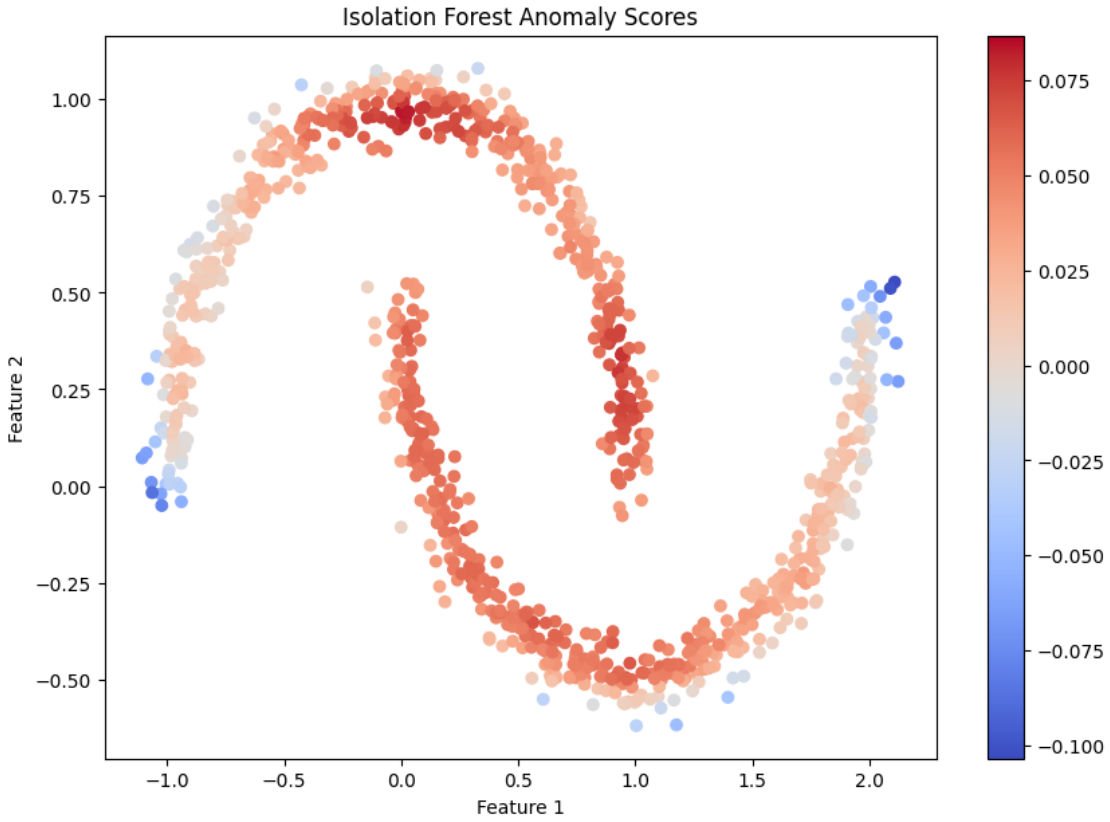
```
# Plot the data points with anomaly scores as colors
plt.figure(figsize=(10, 7))
plt.scatter(X[:, 0], X[:, 1], c=scores, cmap='coolwarm')
plt.colorbar()
plt.title('Isolation Forest Anomaly Scores')
plt.xlabel('Feature 1')
plt.ylabel('Feature 2')
```

```
plt.show()
```


Isolation Forest Anomaly Scores
Feature 1
Feature 2
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−1.0
−0.5
0.0
0.5
1.0
1.5
2.0
0.075
0.050
0.025
0.000
−0.025
−0.050
−0.075
−0.100