Pulsar Stars Classification

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Introduction

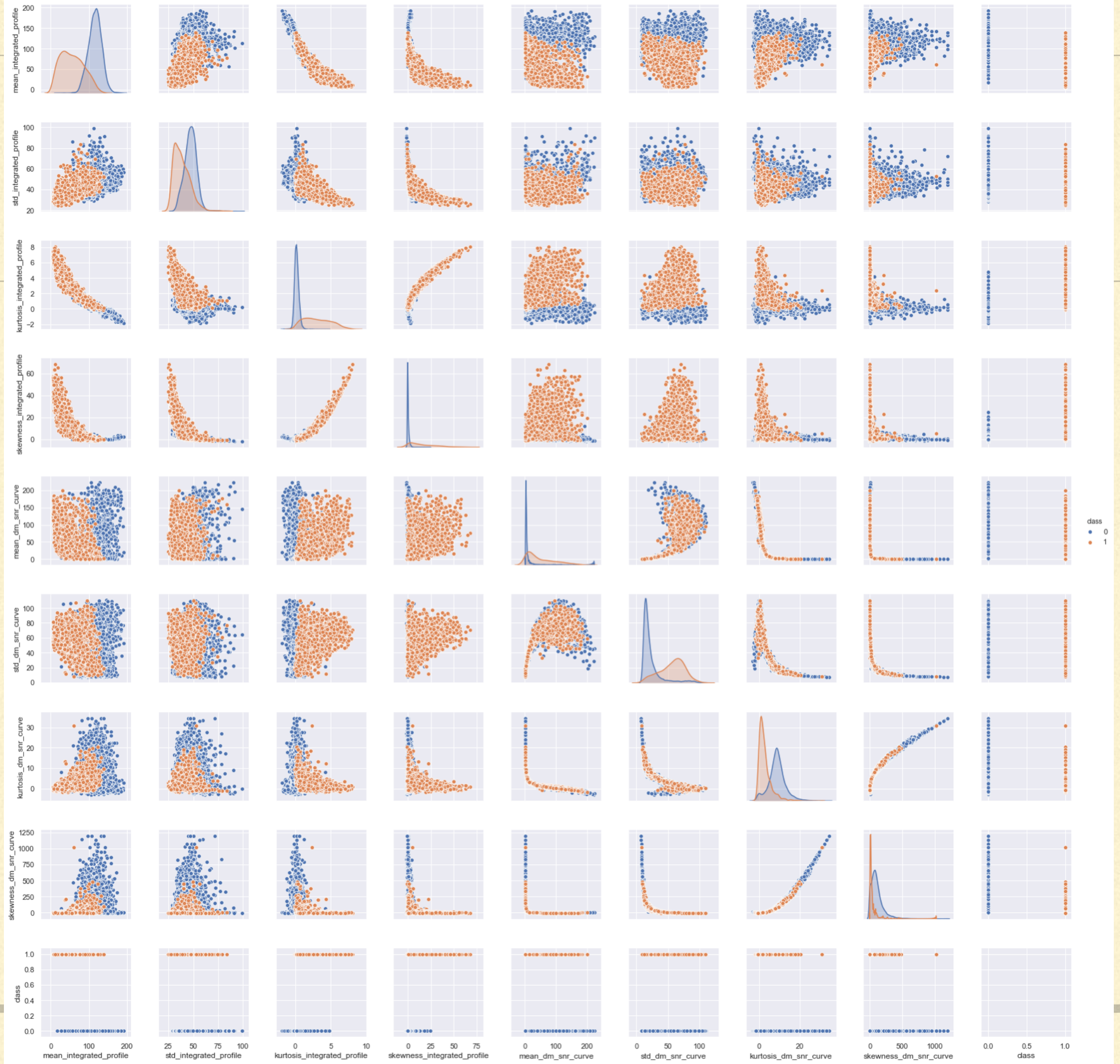
- Pulsar Stars are a rare type of star that produce radio emission.
- Large radio telescopes are used to detect pulsar stars.
- Almost all detections are radio interference or noise.

HTRU2 Data Set

- High Time Resolution Universe Survey
- 16,259 observations
- 1639 real pulsar examples

6 Machine Learning Algorithms

- Logistic Regression
- K-nearest Neighbors
- Support Vector Machines
- Adaboost
- Gradient Boosting
- Random Forest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mean_dm_snr_curve
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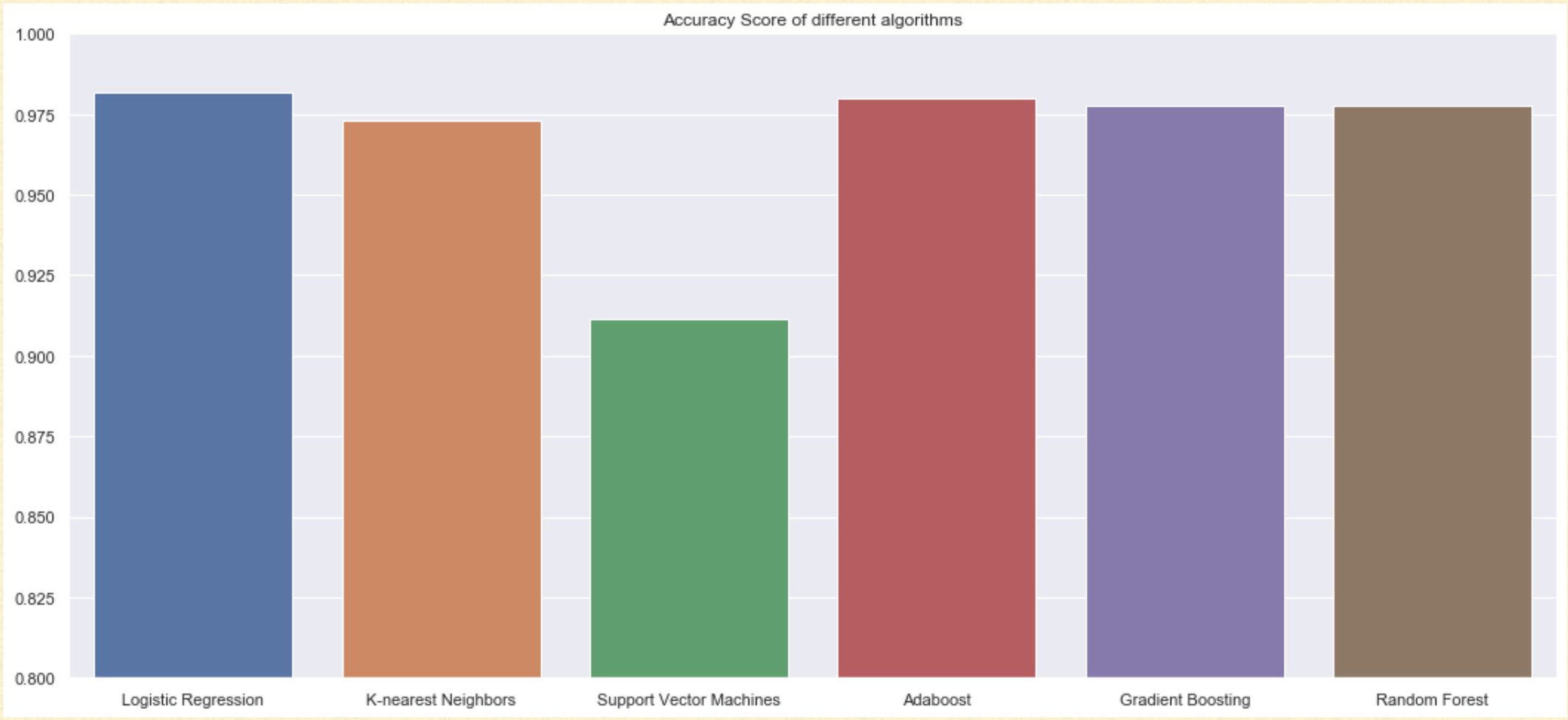
Results


Accuracy Score of different algorithms
1.000
0.975
0.950
0.925
0.900
0.875
0.850
0.825
0.800
Logistic Regression
K-nearest Neighbors
Support Vector Machines
Adaboost
Gradient Boosting
Random Forest

Conclusion

- All models accuracy over 90%
- Logistic Regression and Adaboost are the best at 98%

Future Work

- Perform the classification on a more complicated data set, for example the HTRU1 data set with 30 features.
- Try other machine learning algorithms.
- With the use of more computing power, tune different parameters using grid search.