Fake Profile Detection using different Classification Algorithms

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Abstract— This project explores the trend of various parameters in a multi-class problem of classification of yelp businesses. The objective of this project is to understand the impacts of these parameters on the model and to find the best model for each algorithm for the business and checkin parts of the YELP Dataset. In order to analyze different models, evaluation metrics considered for the same are accuracy, precision, recall-rate and run time.

I. INTRODUCTION

The use of social networking sites like Facebook, Gmail, Twitter, Instagram is on the rise. By the expansion of social networking sector, malicious users seek to violate the privacy of other users by creating fake accounts. Privacy of users is a main concern in today's world. Hence, organisations are trying to detect malicious users and fake accounts in order to eliminate them and put a stop to this cybercrime. In this project, we aim to find those malicious accounts, by applying data classification algorithms on a data-set containing user records.

II. APPROACH FOLLLOWED

- We took our data-set from kaggle for Instagram users that contains 1000 user records.
- We divide the data-set into training and testing data.
- We converted our obtained data-set from kaggle to panda dataframes and then process our data.
- The classification attribute is labeled as 'fake' in the data-set and we did our classification based on it.
- Classification Algorithms used:
  - Random Forest
  - Decision Tree
  - K Nearest Neighbours
  - Ada Boost
  - Support Vector Machines
  - Logistic Regression
- Parameters used in Classification:
  - Accuracy
  - Precision
  - Recall
  - F-M
  - MCC(Matthew Correlation Cofficient)
  - AUC
- These classification algorithms can by used using sklearn library in python.
- Firstly, we calculated the individual attribute classifications of data-set by using the above mentioned algorithms.
- Then, we calculated the prediction score using the training data-set.

Fig. 1.   Individual attribute Classification by Random Forest

- Then, we calculated the prediction score using the testing data-set.
- Lastly, we compare the both predictions using ROC cure.

III. COMPARITIVE RESULTS

All throughout this analysis, 6 parameters namely accuracy, precision, recall, F-M, AUC and MCC have been used to evaluate the changing trends and performance of different algorithms with different hyper-parameter changes.
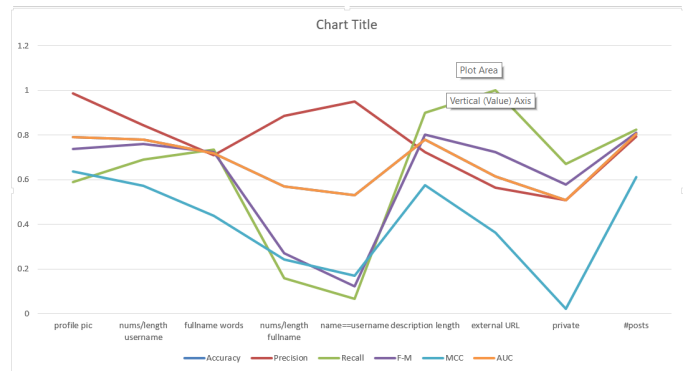

Fig. 2.   Line Graph for all attribute Classification using Random Forest
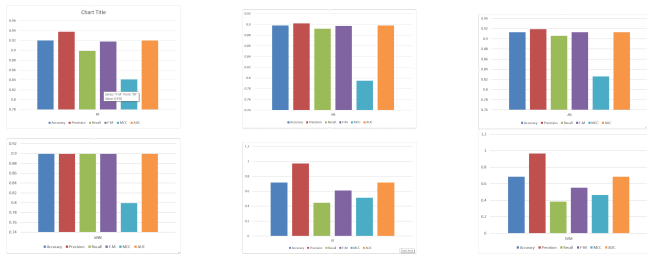
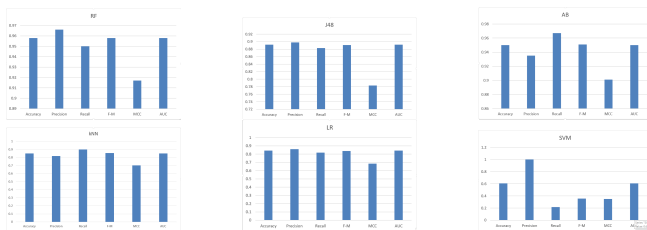Fig. 3. 6 Parameters values of different algorithms on Training Dataset

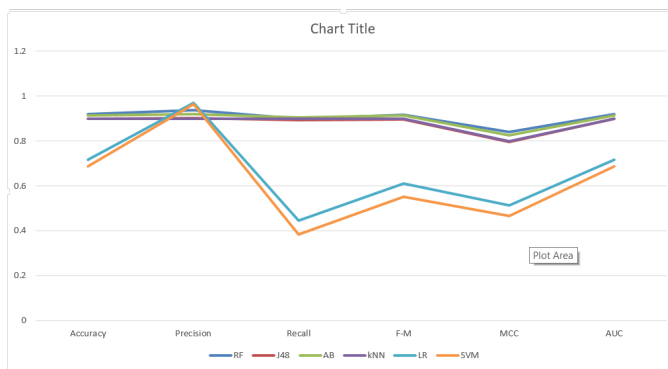Fig. 5. 6 Parameters values of different algorithms on Testing Dataset

Fig. 4. Line Graph for 6 Parameters values of different algorithms combined on Training Dataset
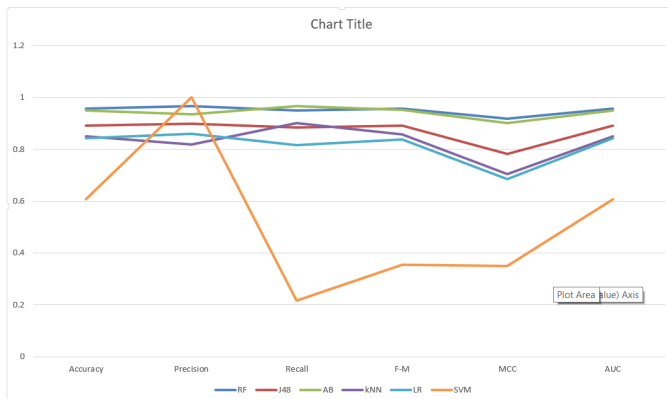

Fig. 6. Line Graph for 6 Parameters values of different algorithms combined on Testing Dataset

IV. CONCLUSION

For Individual Attribute Classification using Training Data-set:

- Profile pic attribute has highest accuracy.
- Profile pic attriubte has highest precision.
- External url has highest recall.
- Description lenght has highest F-M.
- Profile pic attribute has highest MCC.
- posts has highest AUC.
- We divide the data-set into training and testing data.

For Training Dataset Classification using Different Algorithms :

- Random Forest has highest accuracy.
- SVM attriubte has highest precision.
- Adaptive Boosting has highest recall.
- Random Forest has highest F-M.
- Random Forest has highest MCC.
- Random Forest has highest AUC.

For Testing Dataset Classification using Different Algorithms :

- Random Forest attribute has highest accuracy.
- SVM has highest precision.
- Adaptive Boosting has highest recall.
- Random Forest has highest F-M.
- Random Forest has highest MCC.
- Random Forest has highest AUC.

REFERENCES

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[3] Data-set https://www.kaggle.com/free4ever1/instagram-fake-spammer-genuine-accounts