

Intelligent Classifier of Patterns for celestial bodies using a Two-dimensional approach

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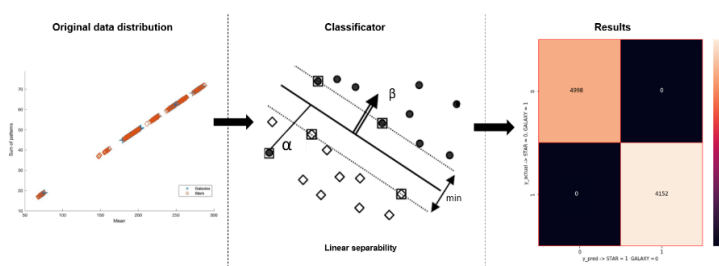


Abstract

Human curiosity towards astronomy in recent decades has allowed the development of great technological advances, which has helped to deepen the knowledge of celestial bodies. Unfortunately, there are still certain inconsistencies in the terminology and classification, therefore this paper proposes the possibility of an intelligent classification based on the features of celestial bodies instead of calculating their electromagnetic fields. Physical criteria are proposed obtained from the data bank of the Digital Sky Survey which was modified in the Kaggle data repository for discrimination between different body classes. The classification obtained has some advantages, especially in the reduction of time and lower computational cost on KNN (K Neighbors Classifier), SVM, Naive Bayes Classifier, Decision Tree Classifier and Random Forest Classifier.

Figure 1: The presented database contains 14 numerical features and 9150 patterns, of which 4998 belong to the galaxy class and 4152 to the star class, the database has an imbalance index of

generate a linear separability between the participating classes and subsequently a superstructure is implemented, which makes the classification of the same. Comparing this model, in fig.2, with the previously mentioned classifiers obtained a relatively good accuracy result, but to classify an unbalanced database it is better to take as performance measures specificity, sensitivity and F1 measure, therefore, the results obtained on the Kaggle platform may indicate a bias in some of the classes.



1.2 which indicates that the database is balanced

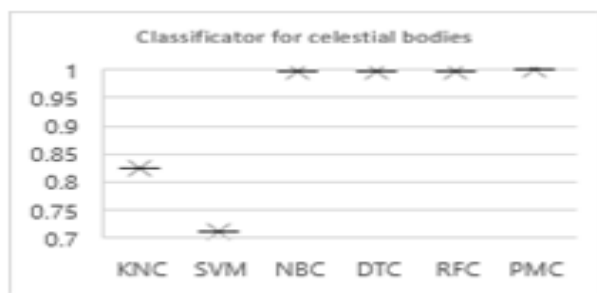


Fig.2 Comparative graph.

The proposed new methodology (Fig.1) uses an innovative approach, since the use of a pre-processing method allows to

Biography:

Jimenez Cruz Raul has completed his Master degree at the age of 25 years, currently he is studying his PhD from Centro de Investigación en computación of IPN. He is a teacher and he has published some papers.

Speaker Publications:

1. Jiménez Cruz Raul. "Metodología de la investigación - Instituto Profesional MR"; 2020.
2. Jiménez Cruz Raul. "Urban monitoring system using crowdsensing techniques in mobile applications"; 2020.

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