Galaxy Image Classification using Non-Negative Matrix Factorization

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Abstract

In modern astronomy with the advent of astronomical imaging technology developments and the increased capacity of digital storage, lead to the production of photographic atlases of data which need to be processed autonomously. Galaxies morphology is an important topic to understand questions concerning the evolution and formation of galaxies and their content. In this work, morphological classification of galaxies is presented using a new method based on Non-Negative matrix factorization for images of galaxies in the Zsolt frei Catalog. The algorithm is trained using manually classified images of elliptical, spiral and lenticular galaxies. Experimental results show that galaxy images from Zsolt Frei catalog can be classified automatically with an accuracy of 93 percent compared to classifications carried out by other authors and manually classified.

References

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Index Terms

Computer Science

Image Processing

Keywords

Galaxy classification; Hubble's classification scheme; De Vaucouleurs; Non-negative Matrix Factorization (NMF).