

# New features in galaxy morphological analysis

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## Abstract

The precise galaxy classification is a challenge in morphology and data mining areas, due to the size of the datasets (for example, in this work we aim to classify more than 1Tb of galaxies images), and the variety of this data. One of the fundamental problems in the galaxies classification is the information extraction, which are expressed by a set of indexes. In this work is presented a study of the non-parametric indexes. We describe a refinement of the well-known non-parametric indexes, which are the Concentration ( $C_1, C_2$ ), Asymmetry ( $A_2, A_3$ ), and Smoothness ( $S_2, S_3$ ). We also describe improvements to the Entropy ( $H_n$ ) and Spirality ( $\sigma_2, \sigma_3$ ) indexes that were recently introduced in morphometric systems [2]. To contribute with these systems, we also introduce a new index that follows the Gradient Pattern Analysis (GPA) formalism the so-called Algebraic Assymmetric Gradient Coefficient ( $G_{alg}$ ). As result we observed an improvement in the entropy index, and in concentration indexes. We also observed good results for  $G_{alg}$ .

**Keywords:** Data Mining, Morphology, Image Processing.

## References

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