

MORPHOLOGICAL CLASSIFICATION OF GALAXIES BY ARTIFICIAL NEURAL NETWORKS

Author(s): Storrie-Lombardi, M.C., Lahav, O., Sodre, L., and Storrie-Lombardi, L.J.

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Abstract: We explore a method for automatic morphological classification of galaxies by an Artificial Neural Network algorithm. The method is illustrated using 13 galaxy parameters measured by machine (ESO-LV), and classified into five types (E, SO, Sa + Sb, Sc + Sd and Irr). A simple Backpropagation algorithm allows us to train a network on a subset of the catalogue according to human classification, and then to predict, using the measured parameters, the classification for the rest of the catalogue. We show that the neural network behaves in our problem as a Bayesian classifier, i.e. it assigns the a posteriori probability for each of the five classes considered. The network highest probability choice agrees with the catalogue classification for 64 per cent of the galaxies. If either the first or the second highest probability choice of the network is considered, the success rate is 90 per cent. The technique allows uniform and more objective classification of very large extragalactic data sets.

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Addresses:

STORRIE-LOMBARDI, MC (reprint author), UNIV CAMBRIDGE, INST ASTRON,
MADINGLEY RD, CAMBRIDGE CB3 0HA, ENGLAND
ROYAL GREENWICH OBSERV, CAMBRIDGE CB3 0EZ, ENGLAND
UNIV SAO PAULO, INST ASTRON & GEOFIS, BR-01065 SAO PAULO, BRAZIL