THE SENSITIVITY MATRIX OF A NEURAL NETWORK PERFORMING IMAGE PROCESSING

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Abstract. In this paper we use a technique to encode astronomical images using some moments chosen among the most convenient ones and evaluate the sensitivity matrix of a neural network that tests the similarity of real astronomical images to predefined reference profiles. The sensitivity matrix knowledge is of particular importance because it allows to investigate the neural network answer to noisy versions of the moments which constitute the actual inputs, so giving useful indications on the robustness of the method. We can define the obtained results very satisfying; the matrix reveals very small changes of the evaluated outputs in presence of noisy inputs so conferming the robustness of neural network approximation techniques and their reliability in these tasks.

Keywords: Sensitivity Matrix, Noise Treatment, Image Modelisation

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