Background modeling for video sequences by stacked denoising autoencoders*

*Note: The full contents of this paper have been published in the volume *Lecture Notes in Artificial Intelligence 11160* (LNAI 11160)

Jorge García-González, Juan M. Ortiz-de-Lazcano-Lobato, Rafael M. Luque-Baena,
Miguel A. Molina-Cabello, Ezequiel López-Rubio
Department of Computer Languages and Computer Science
University of Málaga
Málaga, Spain
{jorgegarcia,jmortiz,rmluque,miguelangel,ezeqlr}@lcc.uma.es

***Abstract*—Nowadays, the analysis and extraction of relevant information in visual data flows is of paramount importance. These images sequences can last for hours, which implies that the model must adapt to all kinds of circumstances so that the performance of the system does not decay over time. In this paper we propose a methodology for background modeling and foreground detection, whose main characteristic is its robustness against stationary noise. Thus, stacked denoising autoencoders are applied to generate a set of robust characteristics for each region or patch of the image, which will be the input of a probabilistic model to determine if that region is background or foreground. The evaluation of a set of heterogeneous sequences results in that, although our proposal is similar to the classical methods existing in the literature, the inclusion of noise in these sequences causes drastic performance drops in the competing methods, while in our case the performance stays or falls slightly.**

***Index Terms*—Background modeling, deep learning, autoencoders**