

Image Processing Using Dynamical NK-Networks Consisting of Binary Logical Elements

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Abstract. In this paper a new method for image analysis is proposed, which uses a three dimensional neural network consisting of binary logical elements. The training process is divided into periods and a unique feature of this network is its self-organization capabilities which can be observed after the first period. Unique features of the initial image can be identified after a half-period. We studied these self-organizing properties of the NK-network consisting of binary logical elements. We also investigated the possibilities of applying such a system to image processing. Finally, peculiar features and advantages of the proposed method were discussed. The described method for image processing can be applied in the area of security informatics for signature authentication and detection of fraud even if the image is distorted by noise.

Keywords: NK-network, self-organization, image processing, image analysis, neural network, binary logical elements, signature authentication.