FAST NEURAL NETWORKS FOR PATTERN DETECTION USING 2D−FFT (WedAmPO2)

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Abstract :

Recently, fast neural networks for object/face detection were presented in [1−3]. The speed up factor of these networks based on cross correlation in the frequency domain between the input image and the weights of the hidden layer. But, these equations given in [1−3] for conventional and fast neural networks are not valid for many reasons presented here. In this paper, correct equations for cross correlation in the spatial and frequency domains are presented. Furthermore, correct formulas for the number of computation steps required by conventional and fast neural networks given in [1−3] are introduced. A new formula for the speed up ratio is established. Also, corrections for the equations of fast multi scale object/face detection are given. Moreover, commutative cross correlation is achieved. Simulation results show that sub−image detection based on cross correlation in the frequency domain is faster than classical neural networks.

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