

FINGERPRINT IMAGE DENOISING USING WAVE ATOM TRANSFORM

SUBBA REDDY BORRA¹, G. JAGADEESWAR REDDY² & E. SREENIVASA REDDY³

¹Research Scholar, Department of Computer Science and Engineering, Hyderabad, Telangana, India

²Principal, Narayana Engineering College, Nellore, Andhra Pradesh, India

³Principal, University College of Engineering, Acharya Nagarjuna University, Andhra Pradesh, India

ABSTRACT

Recently wave atoms have been introduced, as a variant of 2D wavelet packets obeying the parabolic scaling law support size $\sim \sqrt{\lambda}$ (wavelength), particularly well suited for representing oscillatory patterns in images. Wave atoms offer an effective solution to the problems associated with image denoising using wavelets and Curvelets. Finger prints possess the unique properties of distinctiveness, oscillatory patterns and persistence. However, their image contrast is poor due to mixing of complex type of noise. In this paper an attempt has been made to present the results of denoising of such images using wavelets, curvelets and wave atoms. The results obtained demonstrate that the wave atoms based reconstructions are visually sharper than the wavelet and curvelet reconstructions. The recovery of edges and oscillatory features is of particularly superior quality. The results obtained are in accordance with the expected predictions of the existing theory of wave atom transforms.

KEYWORDS: Wave Atoms, Curvelet, Wavelet, Finger Prints, Denoising