Accuracy of fingerprint recognition system is reliable for correct measurement of fingerprint features. Orientation estimation of fingerprint ridges is playing a vital role in image enhancement, segmentation, classification and recognition. The accurate estimation of ridge orientation improves the performance of minutiae extraction and matching algorithm. The noisy fingerprint does not contain the clear ridge structure, that’s why ridge orientation estimation is the toughest and challenging task in fingerprint image enhancement. Gradient-based orientation estimation algorithm is widely adopted and most popular method accepted in literature. This paper enhance the consistency level of ridge orientation after changing the range of output direction from [-\(\pi/4\), \(\pi/4\)] to [0, \(\pi\)] and remove the inconsistency. The implementation is done using java language and the experimental result is made on FVC2000 and FingerDOS databases. The outcome of enhanced new method for estimating ridge orientation give better performance than the existing gradient based approach.
Performance Improvement in Gradient based Algorithm for the Estimation of Fingerprint Orientation Field

18. S. Dass, “Markov Random Field Models For Directional Field And Singularity Extraction


**Index Terms**

Computer Science  
Image Processing

**Keywords**

Fingerprint recognition, fingerprint enhancement, orientation estimation