Sarut Rungrattana-ubon 2011: Focal Point Detection using Ridge Curvature Clustering. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Associate Professor Vutipong Areekul, Ph.D. 77 pages.

This thesis proposes a novel algorithm to detect a focal point of fingerprint or a centroid of fingerprint curvature, which is a unique identical feature that can be used as a reference point for fingerprint registration. The new algorithms based on ridge curvature clustering approach, which obtained by directional field analysis with graph representation. From experimental result, this new approach outperforms other reference point detection schemes in literature in term of accuracy. Moreover, computational complexity and execution time are also reasonable for practical implementation. In conclusion, the new reference point algorithm obtains good performance efficiency and stability with low computational complexity and suitable for automatic fingerprint recognition system. Finally, the proposed curvature graph representation can be applied to improve performance of fingerprint enhancement, fingerprint matching, and fingerprint indexing in the near future.

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Student's signature Thesis Advisor's signature