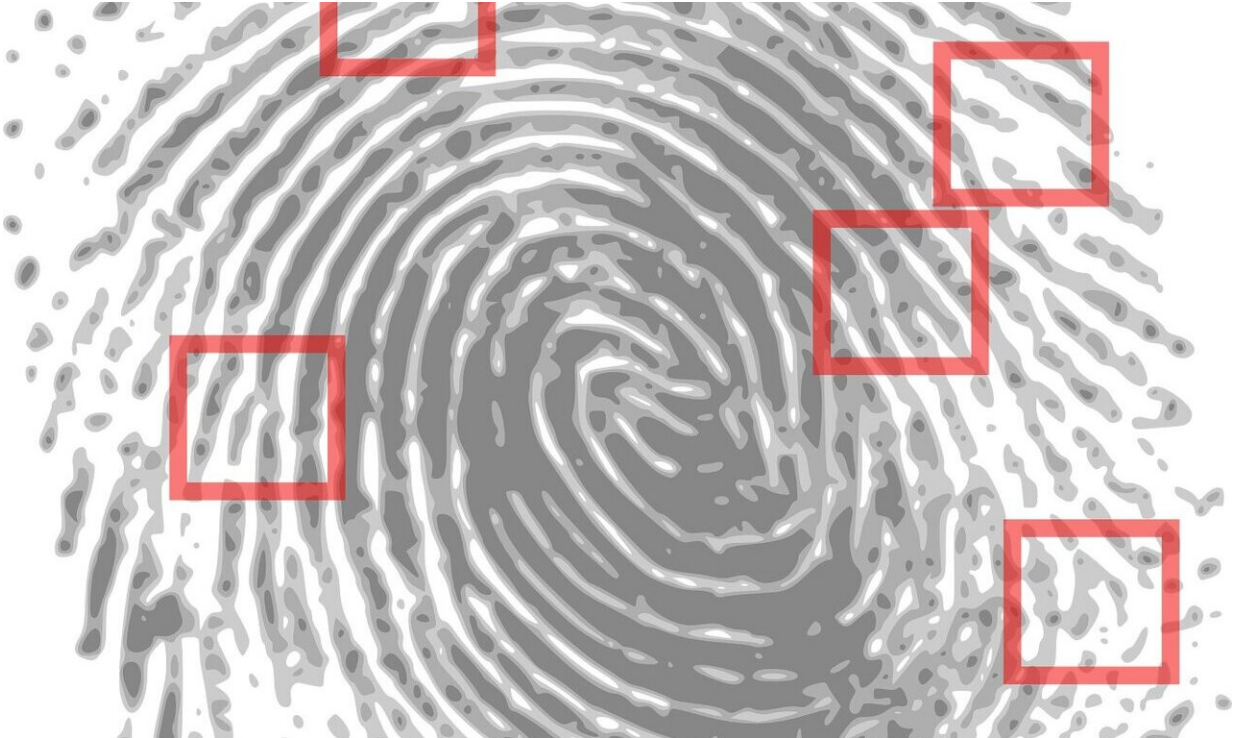


Fingerprinting with machine vision

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Traditional fingerprint identification methods can struggle with accurately identifying feature points in smaller regions. This is usually where a subset of fingerprints that are of limited size might typically be found in a restricted regions of a larger fingerprint image. Ultimately this usually leads to lower recognition accuracy and weaker evidence gleaned from a crime scene investigation, for instance.

Research [published](#) in the *International Journal of Data Mining and Bioinformatics* hopes to overcome that problem. The paper introduces a machine vision technique that has been refined to work on small fingerprint areas. It could overcome many of the challenges faced by crime scene investigators and improve the overall precision of fingerprint recognition. The same technology might also be extended to biometric security systems.

Qiqun Liu and Tan Liu of Henan Vocational College of Agriculture in Zhengzhou Henan, China, have introduced this new approach to small-area fingerprint recognition in order to overcome the limitations of conventional techniques particularly with respect to the recognition of feature points in boundary regions.

The key component of their new approach is a descriptor that provides an analysis of estimated values of the important fingerprint parameters. By using this descriptor, the method extracts detailed feature points and establishes a so-called frequency field. This can then be used to direct enhancements of the small-area fingerprint image to improve clarity. An additional process then extracts detailed features from the enhanced small-area fingerprint image.

The researcher's experiments give a good indication of the effectiveness of this method, allowing them to accurately extract detailed features from seemingly obscure fingerprint images. Notably, the average recognition time has been reduced to just over half a minute compared with the much longer times of more conventional approaches when presented with the same kinds of image. Moreover, the technique offers a more uniform distribution of feature points and so excels in the identification of ridge features on image edges.

The same machine vision technology might be extended beyond [forensic science](#) to applications in biometric security systems and [access control](#).

The efficiency and accuracy improvements wrought by the new approach could thus be used to enhance the reliability of biometric authentication systems.

More information: Qiqun Liu et al, A high precision recognition method for small area fingerprints based on machine vision, *International Journal of Data Mining and Bioinformatics* (2024). [DOI: 10.1504/IJDMB.2024.136226](https://doi.org/10.1504/IJDMB.2024.136226)

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