

DECIPHERING CRIMINAL MINDS

In the future, criminals could soon be convicted by their vein patterns instead of their fingerprints, thanks to a breakthrough by SCE Professor Adams Kong and his team from the Forensics and Security Laboratory, which may allow investigators to identify subjects in digital photos based on their vein patterns.

One of the challenges posed by the increasing use of digital photographs as criminal evidence is that the faces of the criminals or victims are often not clearly visible, making it difficult for criminal investigators to identify them.

In collaboration with the Criminal Investigation Department of the Singapore Police Force and the Singapore Prison Service, Professor Kong and his team have created a computational method to visualise vein patterns in skin images captured by digital cameras. The blood vessel

between the skin and the muscle covering most parts of the human body is a powerful biometric trait because of its universality, permanence and distinctiveness. Making use of the principles of optics and skin biophysics, the team modelled the inverse process of skin colour formation in an image and derived spatial distributions of biophysical parameters from colour images, where vein patterns can be observed.



(a) A colour image captured by a digital camera



(b) The resultant vein pattern from (a)