

Method to identify people by their ears developed

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(PhysOrg.com) -- Scientists from the University of Southampton have developed a new technique to identify people by their ears.

The technique, which is called 'Image Ray Transform', can highlight tubular structures, such as ears, making it possible to automatically identify people.

The research, which was carried out by Professor Mark Nixon, Dr. John Carter and Alastair Cummings from the University's School of Electronics and Computer Science, describes how the Image Ray Transform uses light rays to highlight circular and tubular structures, such as the curved rim at the top of the ear, known as the helix, or spectacle frames. By extracting the elliptical shape of the helix, it can be used as the basis of a method for enrolment (the discovery, localisation and normalisation of the image) for ear [biometrics](#).

Professor Nixon, one of the UK's earliest researchers in this field, first proved that ears were a viable biometric in 2005.

He said at that time that ears have certain

advantages over the more established biometrics, such as face recognition, as they have a rich and stable structure that is preserved from birth to old age, and instead of ageing they just get bigger. The ear is not affected from changes in facial expression and remains fixed in the middle of the side of the head against a predictable background, unlike face recognition which usually requires the face to be captured against a controlled background.

However, the fact that ears can be concealed by hair led Professor Nixon and his team to further research their use as a biometric and to come up with new algorithms to make it possible to identify and isolate the ear from the head.

This new technique achieved 99.6 per cent success at identifying [ears](#) from over 250 images, despite hair concealment and possible confusion with spectacles. These results show great potential for enhancing the detection of structural features.

"Feature recognition is one of the biggest challenges of computer vision," said Professor Nixon. "The Image Ray Transform technique may also be appropriate for use in gait biometrics, as legs act as tubular features that the transform is adept at extracting. The transform could also be extended to work upon 3D images, both spatial and spatio-temporal, for 3D biometrics or object tracking. As a general pre-processing technique for feature extraction in computer images, the technology is now pervading manufacturing, surveillance and medical applications."

More information: The research, published in a paper entitled *A Novel Ray Analogy for Enrolment of Ear Biometrics*, was presented at the recent IEEE Fourth International Conference on Biometrics: Theory, Applications and Systems, held in Washington DC.

Provided by University of South Hampton

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