Converting 2-D photo into 3-D face for security applications and forensics

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It is possible to construct a three-dimensional, 3D, face from flat 2D images, according to research published in the *International Journal of Biometrics* this month. The discovery could be used for biometrics in security applications or in forensic investigations.

Xin Guan and Hanqi Zhuang of Florida Atlantic University on Boca Raton explain how Biometrics, the technology of performing personal identification or authentication via an individual's physical attributes, is becoming an increasingly viable solution for identity management, information protection and homeland security. The researchers have now developed a computer algorithm that can analyze the viewing angle and illumination of a face in an image and generate a 3D view of the face based on the results.

The team points out that while our faces are all different they share so many characteristics that it is difficult for current computer technology to uniquely identify an individual from a flat, 2D image. However, a processed 2D image that yields a 3D image of the face would give a unique perspective.

A 3D image of a person's face might be used in biometrics alongside or instead of fingerprint, iris, face, voice and DNA, recognition techniques for so-called identity management and in security, coupled with smart cards and passwords computer recognition of a real face based on a 3D version of known personnel in a security database could be used to reduce false identification.

The same technique might also be applied to analysis of security footage from closed-circuit television cameras (CCTV) in crime investigation or in searching for missing persons. Ultimately, the same technology might also be adapted by the entertainment industry where 2D images of famous people from the past might be rendered in 3D and so allow a face to be animated

More information: "A method of creating 3-D face images from 2-D photos for face recognition" in *Int. J. Biometrics*, 2011, 3, 40-55

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