Knobbly knees in competition with fingerprints

EurekAlert!

Biometrics using internal body parts

Forget digital fingerprints, iris recognition and voice identification, the next big thing in biometrics could be your knobbly knees. Just as a fingerprints and other body parts are unique to us as individuals and so can be used to prove who we are, so too are our kneecaps. Computer scientist Lior Shamir of Lawrence Technological University in Southfield, Michigan, has now demonstrated how a knee scan could be used to single us out.

The approach based on MRI could be used to quickly register and identify people in a moving queue as they approach passport control at airports for instance or as they walk through the entrance to an office block or other building.

Shamir has tested the approach and achieved accuracy of around 93 percent, this coupled with other factors such as possession of the correct passport, being in the right place at the right time or tied to other biometrics such as iris recognition and signature analysis could be used to prevent deception and fraud. Contact lenses can be used to dupe iris recognition systems, passports can be forged.

"Deceptive manipulation requires an invasive and complicated medical procedure, and therefore it is more resistant to spoofing compared to methods such as face, fingerprints, or iris," Shamir points out. It would be almost impossible to fake one's internal body parts including the kneecaps. Of course, kneecaps are a renowned target of irreversible and deleterious adjustment in the criminal world, but even then shattered kneecaps are likely to be unique to the victim in any case.

MRI scanning avoids health risk of scanning with ionizing radiation, such as X-rays, it would also avoid some of the privacy issues that have arisen with terahertz scanners that can "see" beneath a person's clothing, whereas MRI goes more than skin deep. There is a distinct problem with the implementation of MRI scanning in a security setting in that MRI scanners are very large machines and take a long time to acquire an image of even a small body part such as the kneecap. However, developments in MRI technology are fast moving and it is likely that within the medium term more portable and faster equipment will emerge that could fulfill the security role.

"Further studies will develop the concept of internal biometrics, and will lead to automatic identification methods that are highly resistant to spoofing," concludes Shamir.

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