Diagnostic ultrasound could provide automated method of fingerprint identification

Diagnostic 3D ultrasound of fingers could be used for biometric identification based on matching paired images using internal fingerprint structures that would be difficult to fake, offering the possibility of a unique automated fingerprint identification system, according to a new study by researchers from the University of Michigan in Ann Arbor.

For the study, 3D images were collected of the fingers of 20 volunteers. A group of four readers, including two musculoskeletal radiologists, then attempted to match the pairs based on anatomic and physiological features of the human finger. Radiologists matching the image pairs were 100% successful, and the average success of all four readers was 96%.

"The purpose of the study was to evaluate whether the use of internal finger structure as imaged using ultrasound could act as a supplement to standard methods of biometric identification. Also, this study provides a way of assessing physiologic and cardiovascular status, for example, whether the person is alive or not, which is not known from just their external fingerprints. There is a wide range of applications for an inexpensive ultrasonic fingerprint reader, including widespread use in cell phones," according to Ganesh Narayanasamy, PhD candidate in Applied Physics and lead author of the study.

Besides its many possible biometric identification uses, the findings also have a medical application, say the authors. "This could become a method of patient identification and even continuous physiologic monitoring. The techniques should become useful for other types of musculoskeletal ultrasound and for monitoring of arthritis treatments," said Dr. Narayanasamy.

The full results of the study will be presented on Monday, May 7 during the American Roentgen Ray Society Annual Meeting in Orlando, FL.