

Ears, grips and fists take on mobile phone user ID

26 April 2015, by Nancy Owano



Credit: Christian Holz

A research project has been under way to explore a biometric authentication system dubbed Bodyprint, with interesting test results. Bodyprint has been designed to detect users' biometric features using the capacitive touchscreen as an image scanner. As such, one would use Bodyprint as a convenient replacement for PIN codes for smartphones. The biometric scanner can scan body parts such as ears, palm grips and fists when pressed against the display, to identify the user biometrically.

Christian Holz, Senaka Buthpitiya, and Marius Knaust of Yahoo Labs, Sunnyvale, California, prepared their paper, "Bodyprint: Biometric User Identification on Mobile Devices Using the Capacitive Touchscreen to Scan Body Parts," for CHI 2015, which took place earlier this month in Seoul, South Korea.

The team said that while [mobile phone users](#) may be able to enter a PIN to unlock the device, only a small percentage of them actually protect their device using a PIN. As for fingerprints, the researchers said that capturing them needs high-quality sensors, which incurs considerable cost in

the manufacturing process. Fingerprint scanners in turn have been reserved for top-of-the line [mobile devices](#). The researchers, meanwhile, present Bodyprint, which they defined as a [biometric authentication](#) system that uses the [capacitive sensor](#) of commodity touchscreens to detect users' biometric features. As such, Bodyprint makes use of the capacitive [touchscreen](#) as a low-resolution but large-area image sensor in order to identify users based on parts such as ears, fists, or grips when pressed against the [touchscreen](#).

Greg Kumparak at *TechCrunch* said, "If it can sense all of these things, why not just use the screen to read your fingerprint? The short answer: the [sensor](#) resolution on current smartphone touchscreens isn't high enough for something as small as a lone fingerprint."

That touchscreen nonetheless did the job of identification without the need for any additional hardware or dedicated sensors. The team implemented Bodyprint on an LG Nexus 5 phone, which features a Synaptics ClearPad 3350 touch sensor. Kumparak in *TechCrunch* said that, for potential users of something like this, the fear may be about accuracy; what if others with "vaguely similar ears/palms/what-have-you past the lock screen."

Regarding accuracy, the authors of the study reported their results: The study enlisted 12 participants for each of five poses. The participants held the Nexus 5 phone and performed 12 trial repetitions. Between trials, participants put the phone down on a table. The authors said they did not verify the correctness of performed poses or ask for retries. Overall, they collected 864 trials. Bodyprint identified users with 99.5% precision with a false rejection rate of 26.8% across all [body parts](#), but as low as 7.8% for ear-only matching.

They said that, "In the case that future touchscreens support higher input resolutions, up

to a point where they may detect the fine structure of fingerprints, Bodyprint will readily incorporate the higher level of detail of sensor data, which will not only extend our [approach](#) to further body parts, but likely reduce false rejection rates at the same high levels of authentication precision."

More information: Bodyprint:

www.christianholz.net/bodyprint.html

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