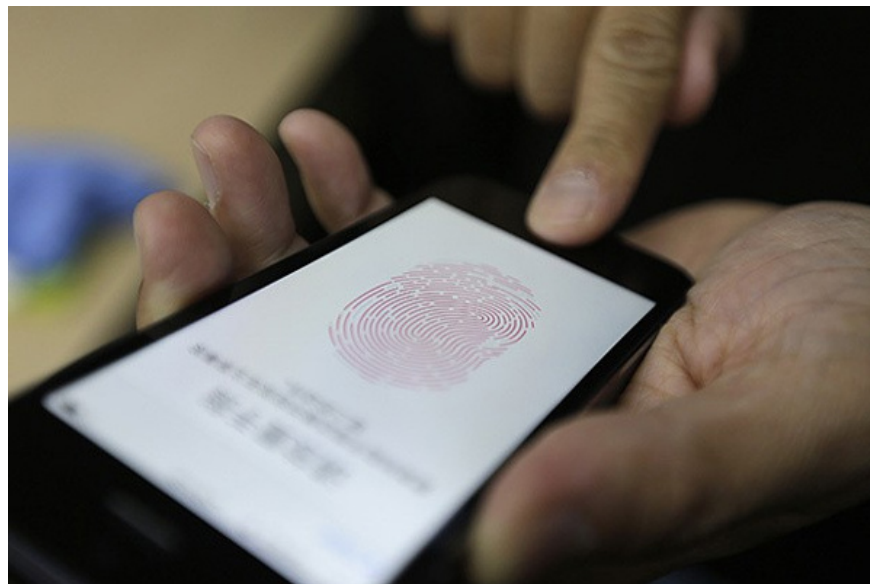


# Can the phone be unlocked by the fingerprint of the dead?

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According to the Tampa Bay Times last March, a policeman shot down a man named Linus Phillip outside Wawa convenience store in Largo, Florida. Although he was approached by his corpse and fingerprints, the inspectors were still unable to unlock his phone to search for information about the incident. Why so?



Anil Jain, professor of computer science at Michigan State University, who has spent many years researching fingerprint identification, said that the longer people actually die, the harder it will be to use their fingers to unlock their phone. By the fingerprint identification system on most smartphones today operate through the ability of fingers to conduct electricity.

## **Operation principle of security system with fingerprint sensor**

When the finger touches the fingerprint scanner on the smartphone, the grooves will not touch the surface of the scanner, but only the lines will touch. Below the surface the fingerprint scanner will be a multitude of micro

capacitors capable of storing electricity. When fingerprints touch the surface of the scanner, because the human body is capable of conducting very small, they will conduct electricity to charge the capacitors below. Meanwhile, the grooves will not charge the capacitors below because they do not touch the scanner. Sensors will rely on this to build a detailed image of the user's fingerprint.



Capacitive fingerprint sensor technology.

But when a person dies, the ability to conduct electricity is no longer available, so the ability to interact with the fingerprint scanner will also disappear. However, how long will it take for people to completely conduct electricity after death? Scientists cannot give the correct answer, because this is a very difficult experiment, it will take a lot of corpses to use their fingerprints to unlock the phone after every hour of continuous use.

However, not all fingerprint scanners operate through the same conductivity as for example old-style fingerprint readers based on optical sensors, for example. They are based on changes in light between lines and grooves to create a fingerprint image. But this method is very easy to face with fake images and this is also the method of fingerprint security used by manufacturers in action movies.

### **New security technologies today**

Currently, manufacturers have integrated new security technologies on smartphones instead of capacitive fingerprint sensors. For example, Apple's iPhone X with 3D face recognition system or Xiaomi Mi 8 EE selects optical fingerprint sensor under the screen. Some other machines even choose "ultrasonic" fingerprint scanners, which locate the grooves and finger lines through ultrasound sent to the finger and rely on that to shape the image. Fingerprint photo.



Xiaomi Mi 8 EE is equipped with optical fingerprint sensor in the screen.

However, it is still not possible to determine whether these new security methods work with lifeless fingerprints.

But according to Jain, the new sensors are all affected by skin changes over time. When a person dies, the fingers will appear some wrinkles or cramps due to no blood vessels flowing through it. This will cause the signs of the groove and the pattern to be changed unlike the old fingerprint. Therefore, it is possible that the sensors cannot be recognized.

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