

Regenerated at: 14:35:56 2003 07 01



Fingerprint security easily fooled

09:10:20 2002 05 17 - mab - from **security-biometrics**

mab writes..

As everyone should have figured out by now, fingerprint security *can* be fooled. Tsutomu Matsumoto has proved that it can be fooled by a non-professional with ~\$10 worth of household equipment and supplies...

Read the original article or read on below.

Fun with Fingerprint Readers

Tsutomu Matsumoto, a Japanese cryptographer, recently decided to look at biometric fingerprint devices. These are security systems that attempt to identify people based on their fingerprint. For years the companies selling these devices have claimed that they are very secure, and that it is almost impossible to fool them into accepting a fake finger as genuine. Matsumoto, along with his students at the Yokohama National University, showed that they can be reliably fooled with a little ingenuity and \$10 worth of household supplies.

Matsumoto uses gelatin, the stuff that Gummi Bears are made out of. First he takes a live finger and makes a plastic mold. (He uses a free-molding plastic used to make plastic molds, and is sold at hobby shops.) Then he pours liquid gelatin into the mold and lets it harden. (The gelatin comes in solid sheets, and is used to make jellied meats, soups, and candies, and is sold in grocery stores.) This gelatin fake finger fools fingerprint detectors about 80% of the time.

His more interesting experiment involves latent fingerprints. He takes a fingerprint left on a piece of glass, enhances it with a cyanoacrylate adhesive, and then photographs it with a digital camera. Using PhotoShop, he improves the contrast and prints the fingerprint onto a transparency sheet. Then, he takes a photo-sensitive printed-circuit board (PCB) and uses the fingerprint transparency to etch the fingerprint into the copper, making it three-dimensional. (You can find photo-sensitive PCBs, along with instructions for use, in most electronics hobby shops.) Finally, he makes a gelatin finger using the print on the PCB. This also fools fingerprint detectors about 80% of the time.

Gummy fingers can even fool sensors being watched by guards. Simply form the clear gelatin finger over your own. This lets you hide it as you press your own finger onto the sensor. After it lets you in, eat the evidence.

Matsumoto tried these attacks against eleven commercially available

search

Search

interface

[Home](#)
[Submit](#)
[Join Us](#)
[Login](#)
[User Details](#)
[Freeside](#)

freeside

[Intelligent Agents](#)
(darkewolf)
[Cyberwear](#)
[Technology](#) (mab)
[Neurophysiology](#)
[Primer Part I](#) (mab)
[Neurophysiology](#)
[Primer Part II](#) (mab)
[Neurophysiology](#)
[Primer Part III](#)
(mab)
[State of the Mind](#)
(mab)
[Smart Systems](#)
(rilel)
[Paranoid Delusions](#)
(RainbowGyrl)

Want to be featured
on cyberpunks.org?
Write a relevant
article about
cybertech or
cyberculture and
email it to us.

related

[Cryptonym](#)
[DCypher.Net](#)
[Anhedonia :](#)
[CyberGen](#)
[Extropy Institute](#)
[Principia](#)
[Cybernetica](#)
[AdBusters](#)

previously

12:29:16 2003 01 23
- Open spectrum and
community wireless
11:18:11 2003 01 23
- Four-winged
gliding-dino fossil

fingerprint biometric systems, and was able to reliably fool all of them. The results are enough to scrap the systems completely, and to send the various fingerprint biometric companies packing. Impressive is an understatement.

There's both a specific and a general moral to take away from this result. Matsumoto is not a professional fake-finger scientist; he's a mathematician. He didn't use expensive equipment or a specialized laboratory. He used \$10 of ingredients you could buy, and whipped up his gummy fingers in the equivalent of a home kitchen. And he defeated eleven different commercial fingerprint readers, with both optical and capacitive sensors, and some with "live finger detection" features. (Moistening the gummy finger helps defeat sensors that measure moisture or electrical resistance; it takes some practice to get it right.) If he could do this, then any semi-professional can almost certainly do much more.

More generally, be very careful before believing claims from security companies. All the fingerprint companies have claimed for years that this kind of thing is impossible. When they read Matsumoto's results, they're going to claim that they don't really work, or that they don't apply to them, or that they've fixed the problem. Think twice before believing them.

Matsumoto's paper is not on the Web. You can get a copy by asking:

Tsutomu Matsumoto

Here's the reference:

T. Matsumoto, H. Matsumoto, K. Yamada, S. Hoshino, "Impact of Artificial Gummy Fingers on Fingerprint Systems," Proceedings of SPIE Vol. #4677, Optical Security and Counterfeit Deterrence Techniques IV, 2002.

Some slides from the presentation are here:

<<http://www.itu.int/itudoc/itu-t/workshop/security/present/s5p4.pdf>>

My previous essay on the uses and abuses of biometrics:

<<http://www.counterpane.com/crypto-gram-9808.html#biometrics>>

Biometrics at the shopping center: pay for your groceries with your thumbprint.

<http://seattlepi.nwsource.com/local/68217_thumb27.shtml>

discovered
11:10:34 2003 01 23
- Space-tug slated to
rescue satellites
10:43:51 2003 01 23
- Dark matter
fuelled early galaxy
formation
13:38:01 2003 01 22
- Microwave gun for
low "collateral
damage"
12:25:45 2003 01 22
- Earth-Mars
opposition
extremely close this
time around
09:23:52 2003 01 22
- Genetic screening
08:57:06 2003 01 22
- CC is no Carbon
Copy
07:35:41 2003 01 21
- Telomere
measurement in
single cells
07:46:00 2003 01 20
- Speed of gravity in
controversy



**ABSOLUTE
ONLINE
PRIVACY**

Zentek
International

Comment
on this
article