

Are There Any Countermeasures?

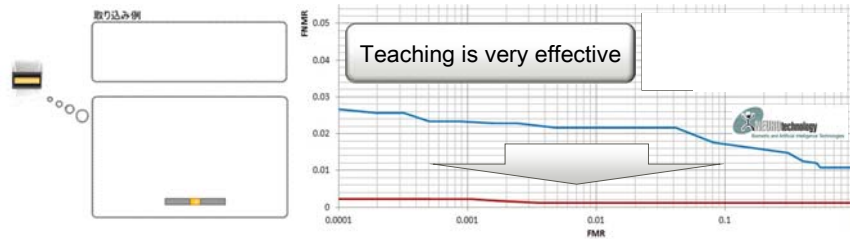
① Deforming captured image

- There are many algorithms:
 - Fingerprint deformation [29, 27, 33]
 - Fingerprint mosaicking [28, 31, 32, 34]
 - Matching [30]

It is important to consider variation input

② Stabilizing input motion with sweep sensor

- Design an appropriate guide and apparatus
- Users have to learn the right way to swipe



20

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Conclusion & Summary

■ Evaluation

- We evaluated the interoperability between area and sweep sensors
- FNMR increases 7 - 8 times, and about 1 - 3% of fingers cannot be verified

■ What are the causes?

- Difference characteristics of touch and sweep sensors
- More variation in how people input a fingerprint than touch sensors

■ Countermeasures

- Teaching users how to input is very effective
- Deforming fingerprints may be effective

21

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Conclusion & Summary

■ Minutiae reproducibility for seasonal variation

- Seasonal variation influences data from people of all ages
- Countermeasures
 - ① Try the other hand
 - ② Image enhancement or template update (if possible)
 - ③ Predict method (future work)

■ Interoperability between touch and sweep sensors

- About 1 - 3% of fingers cannot be verified
- Countermeasures
 - How much FAR you set
 - Teaching users how to input is very effective

22

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23

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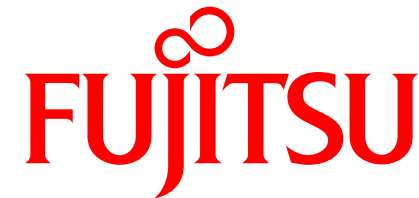


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