

A proposal of **secure** and **green** printing system

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Background

- **We are consuming a lot of papers in our life**
 - **Newspapers, tickets and office documents**
- **Especially focus on business environments**
 - **In formal meeting, we prepare many papers**
 - **Almost of them had gone to trash boxes**

My contributions

- A new concept of **green** printing system with **security** requirements
- **Security**
 - Keep to be secure when papers are stolen
- **Green** (earth friendly)
 - Papers can be recycled without refreshing

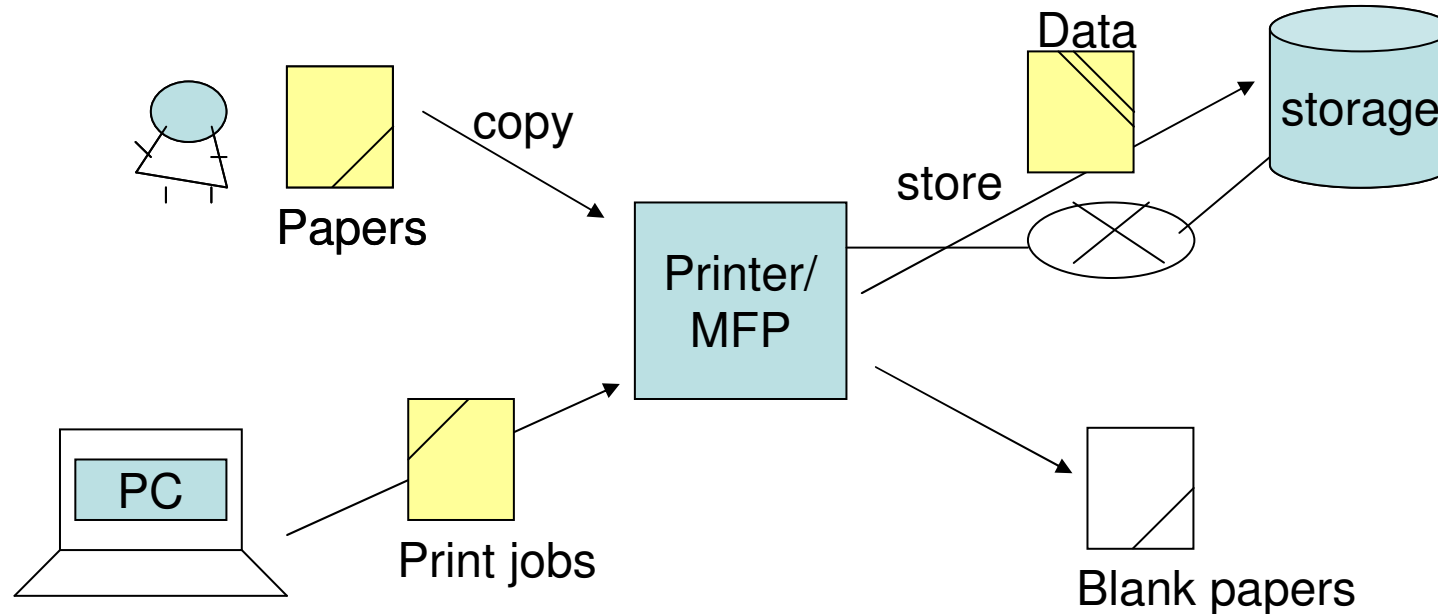
Simple (& powerful) concept

Printing without ink

= Only scanning in the printer

= getting just blank papers

Proposed system



- **When we copy papers in MFP, only scan.**
- **Then the printer send data to the network storage. (similarly print request from PC)**
- **Receive blank papers that virtually printed**

How to identify a blank paper

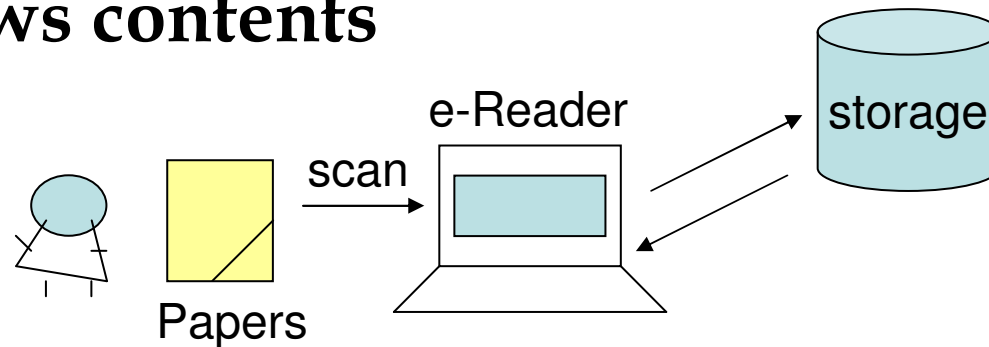
- Paper-fingerprint

- Fingerprinting Blank Paper Using Commodity Scanners

- William Clarkson, Tim Weyrich, Adam Finkelstein, Nadia Heninger, J. Alex Halderman, and Edward W. Felten.
 - IEEE Symposium on Security and Privacy, Oakland, CA, May 2009.
 - <http://citp.princeton.edu/paper/>

How to read

- We use an e-Reader with scanning device
 - 1. scans a blank paper -> gets a unique paper-id
 - 2. requests document-data from the NW storage
 - 3. shows contents



- When you stack papers onto e-Reader, we may use techniques of visual cryptography.

How to modify

- **We implemented a prototype system**
 - **However it's proof-of-concept level**
- **We choose glasses instead of an e-Reader**
- **+ Virtual Reality techniques**

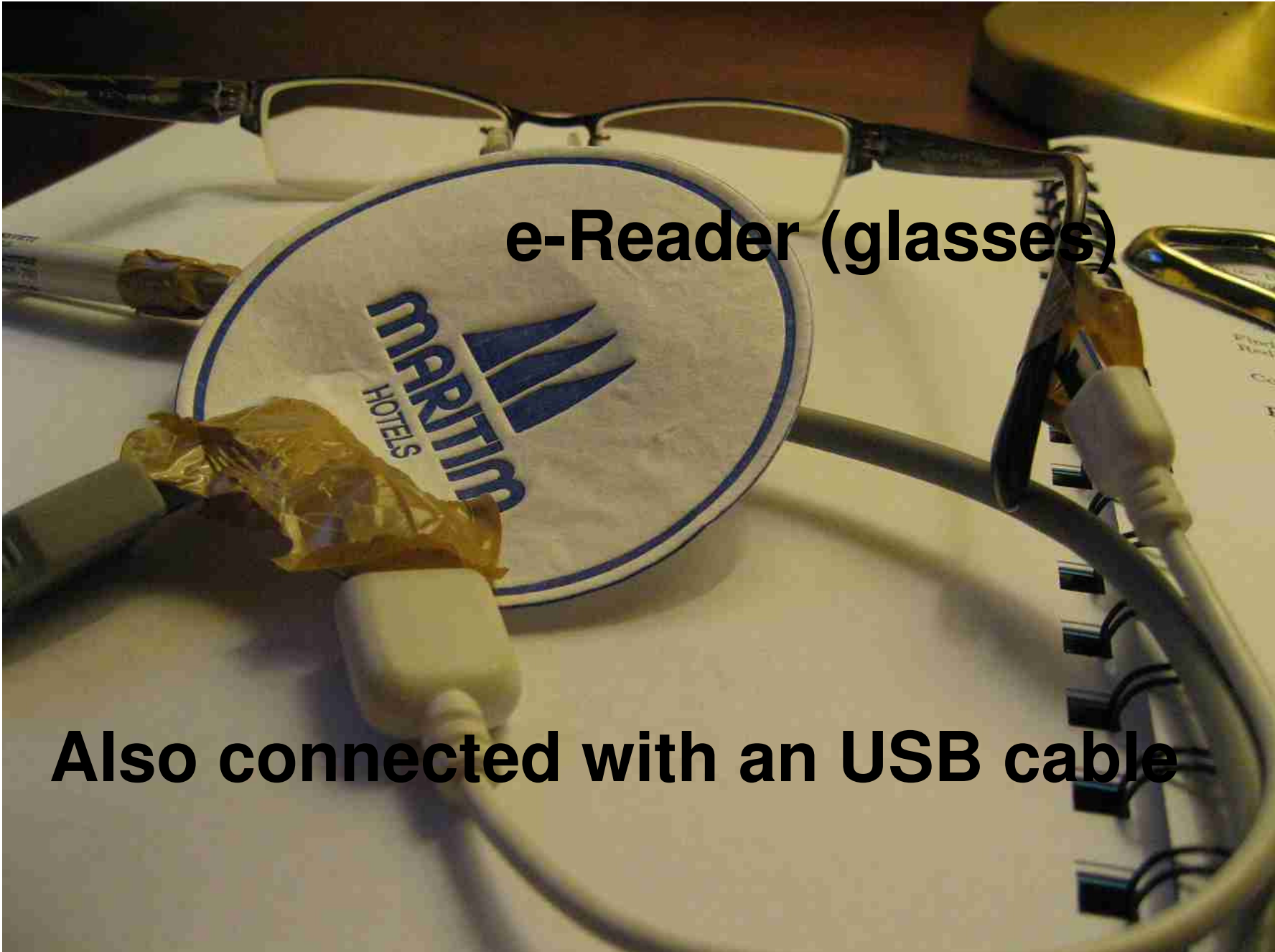


Touch pen

Touch Panel

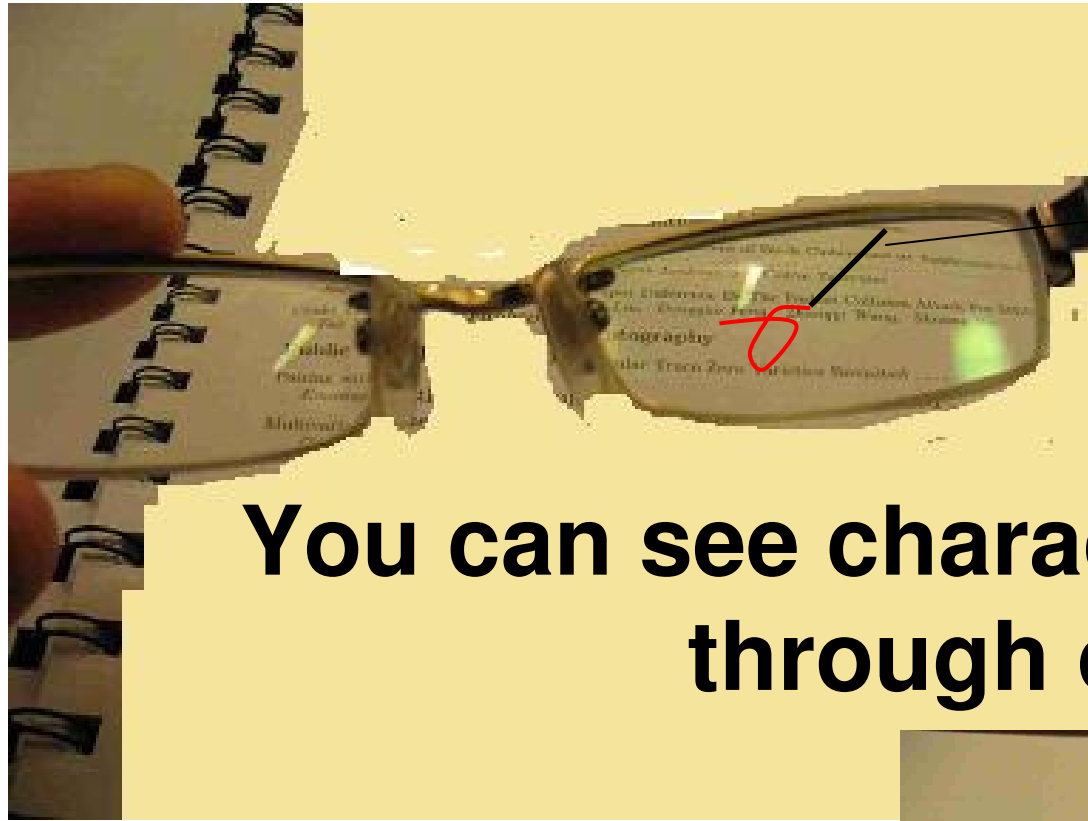


Connected with an USB cable.



e-Reader (glasses)

Also connected with an USB cable



Virtual pen

**You can see characters
through only glasses**

**Differences are automatically
updated on storage**



How to trash

- **Just only scan by e-trash box**
 - From paper-fingerprint, the e-trash box sends a trash request to NW storage
- **We can use blank papers next time**
 - Unbind data of paper-id

Not patented

- You can use this idea freely
- If you are interested in this system,
or you would like to establish your venture,
I got ...

ecology
seco-p.com
security printing

- **I got this domain and paid 8 Euros this morning**

ecology
seco-p.com
security printing

- I got this domain and paid 8 Euros this morning
- Only 10 Euros! You have a chance to get it!
- With 100% swine flu protection mask

Special Offer!
~~20 Euros~~
**10 Euros
(50%OFF)**

