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Side-channel attacks

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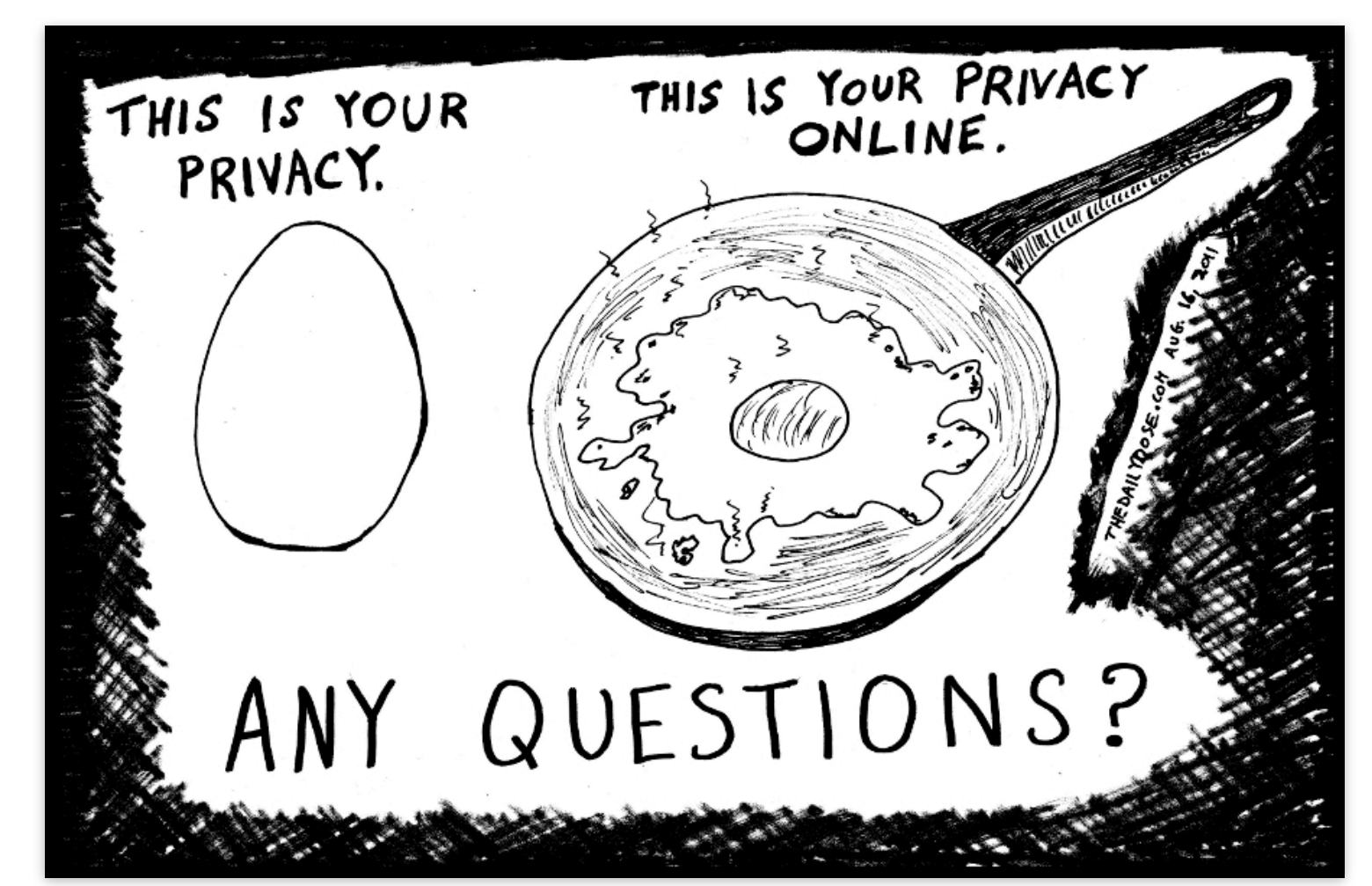
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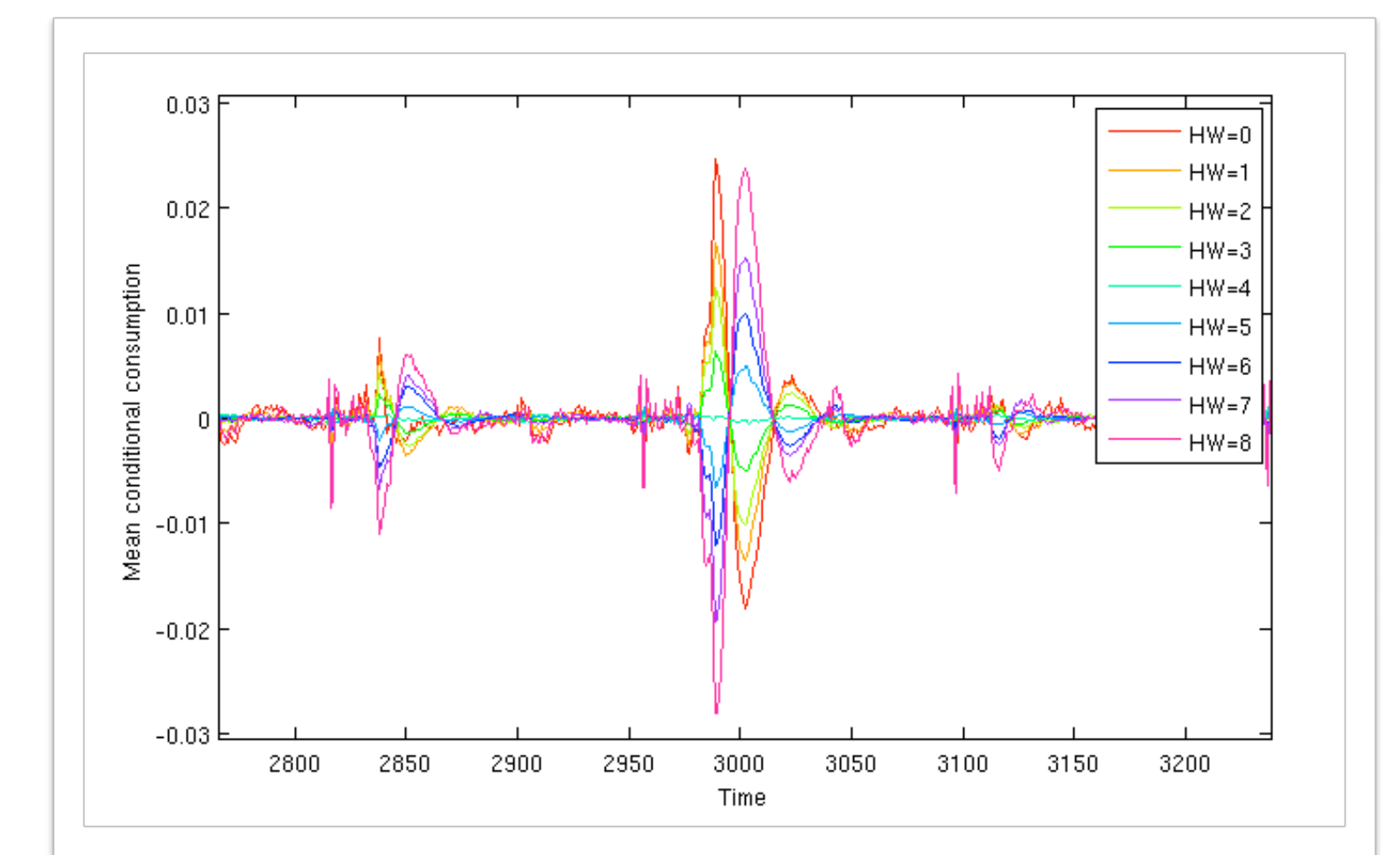
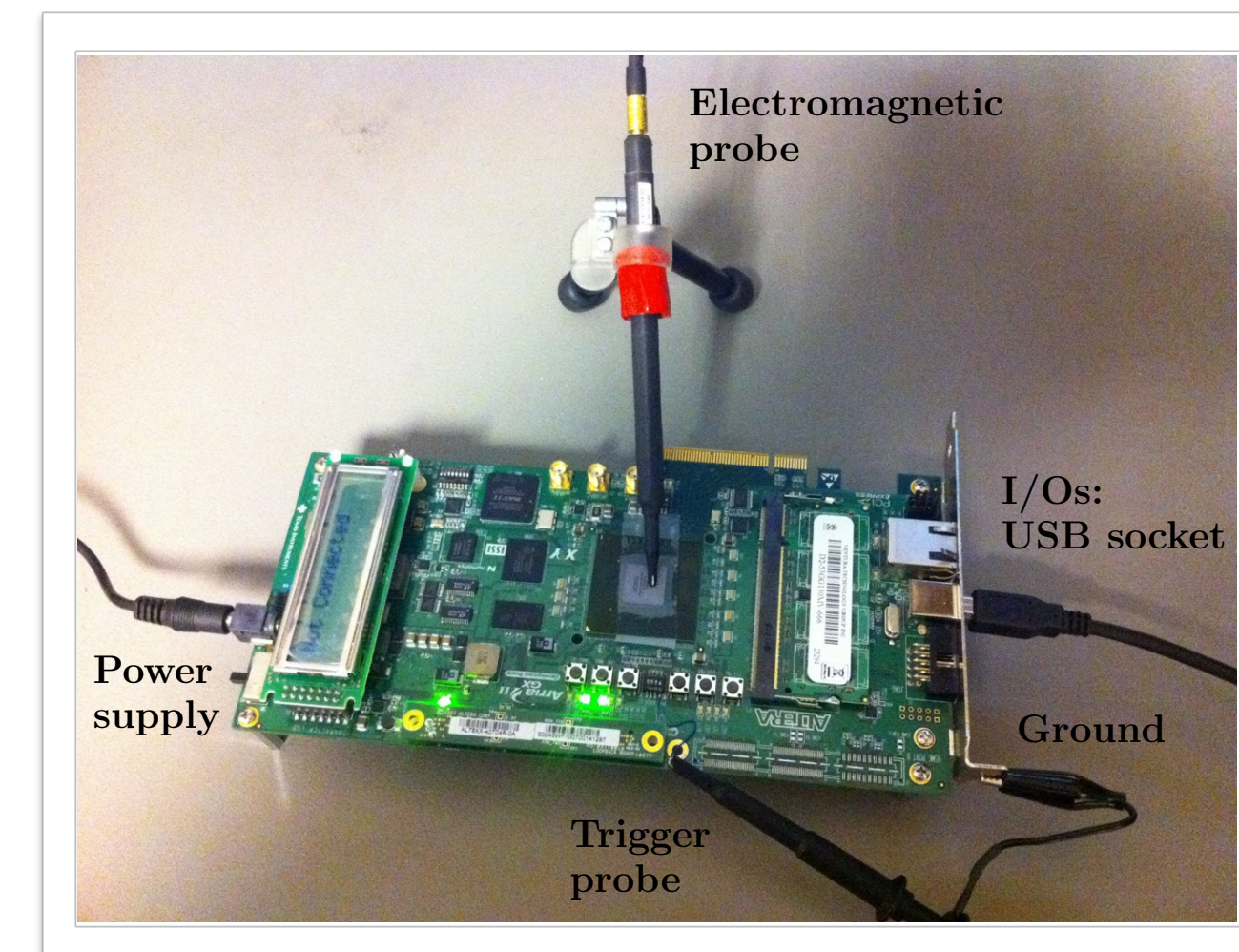
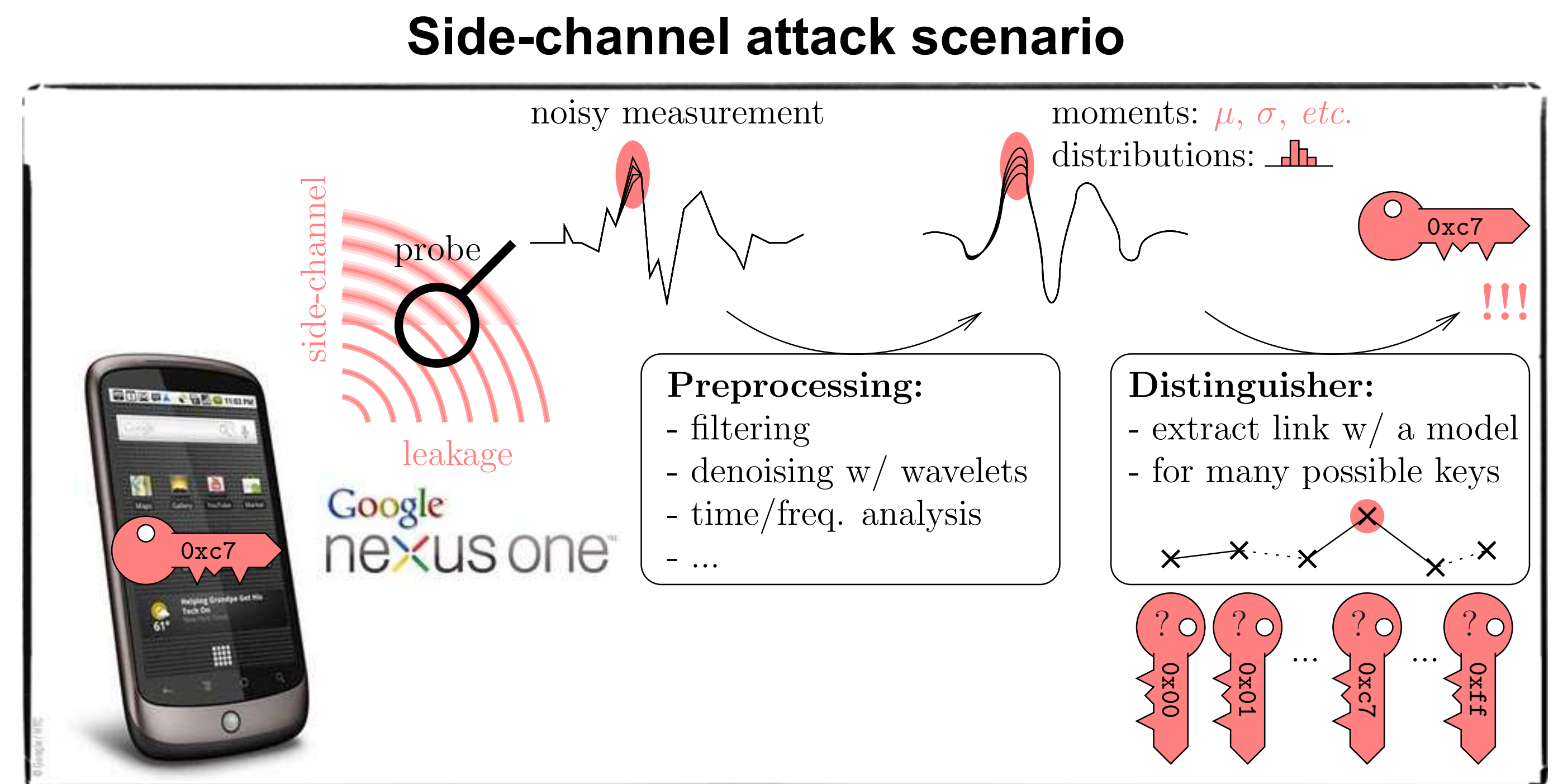
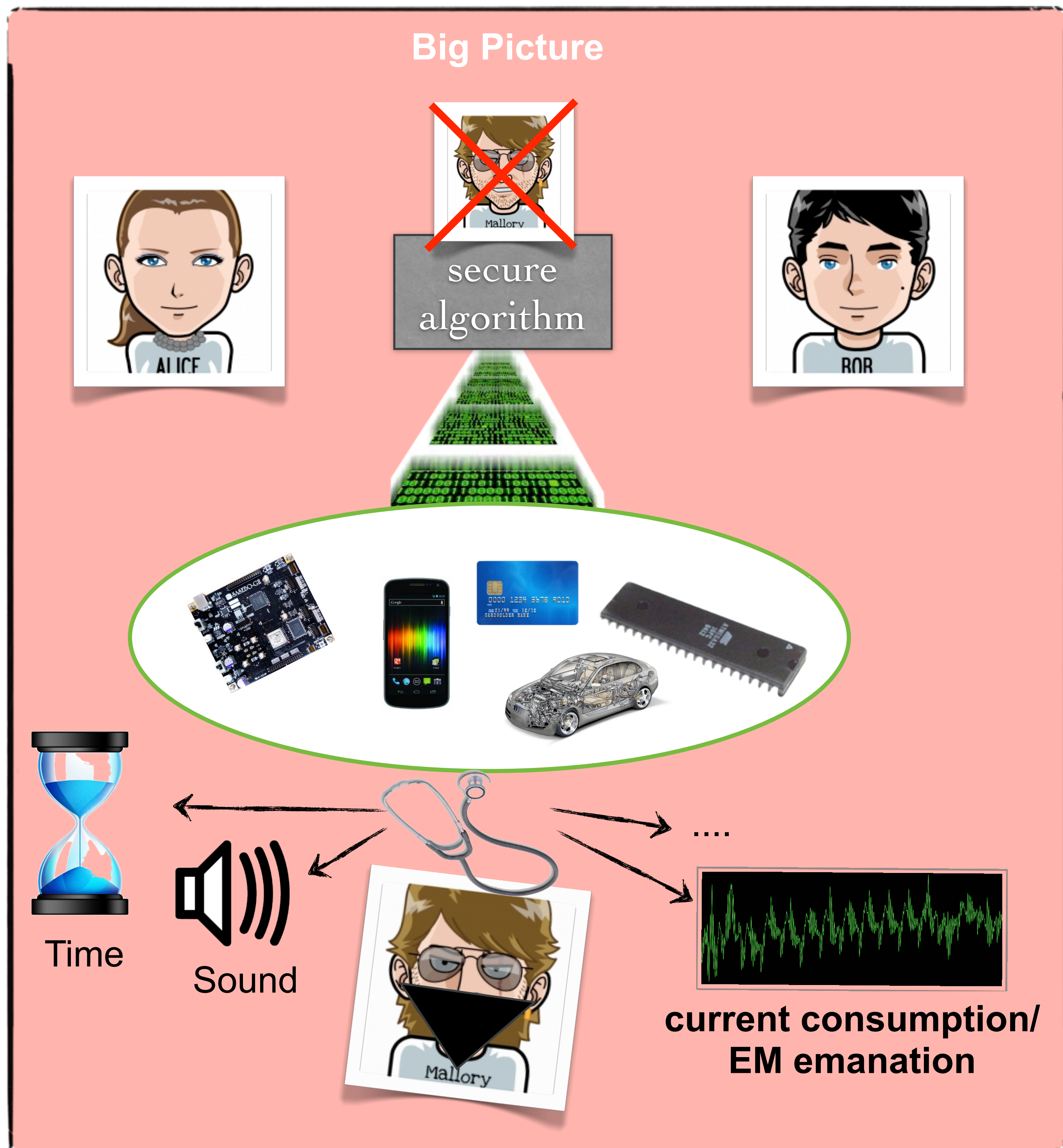
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“Classical” side-channel attacks



Open questions

How to (fairly) compare side-channel distinguishers? [3]

How to theoretically model side-channel attacks, e.g., with an information theoretic model?

How to precisely (effectively) model the arising side-channel leakage from the device?

- [1] Annelie Heuser, Michael Zohner: Intelligent Machine Homicide - Breaking Cryptographic Devices Using Support Vector Machines. COSADE 2012
- [2] Annelie Heuser, Housseem Maghrebi, Sylvain Guilley, Olivier Rioul, Jean-Luc Danger: Mathematical and Empirical Comparison of Information-Theoretic Side-Channel Distinguishers (under submission)
- [3] Annelie Heuser, Sylvain Guilley, Olivier Rioul: Success Metric: An all-in-one criterium for comparing side-channel distinguisher (in preparation)

Profiled Side-channel distinguisher

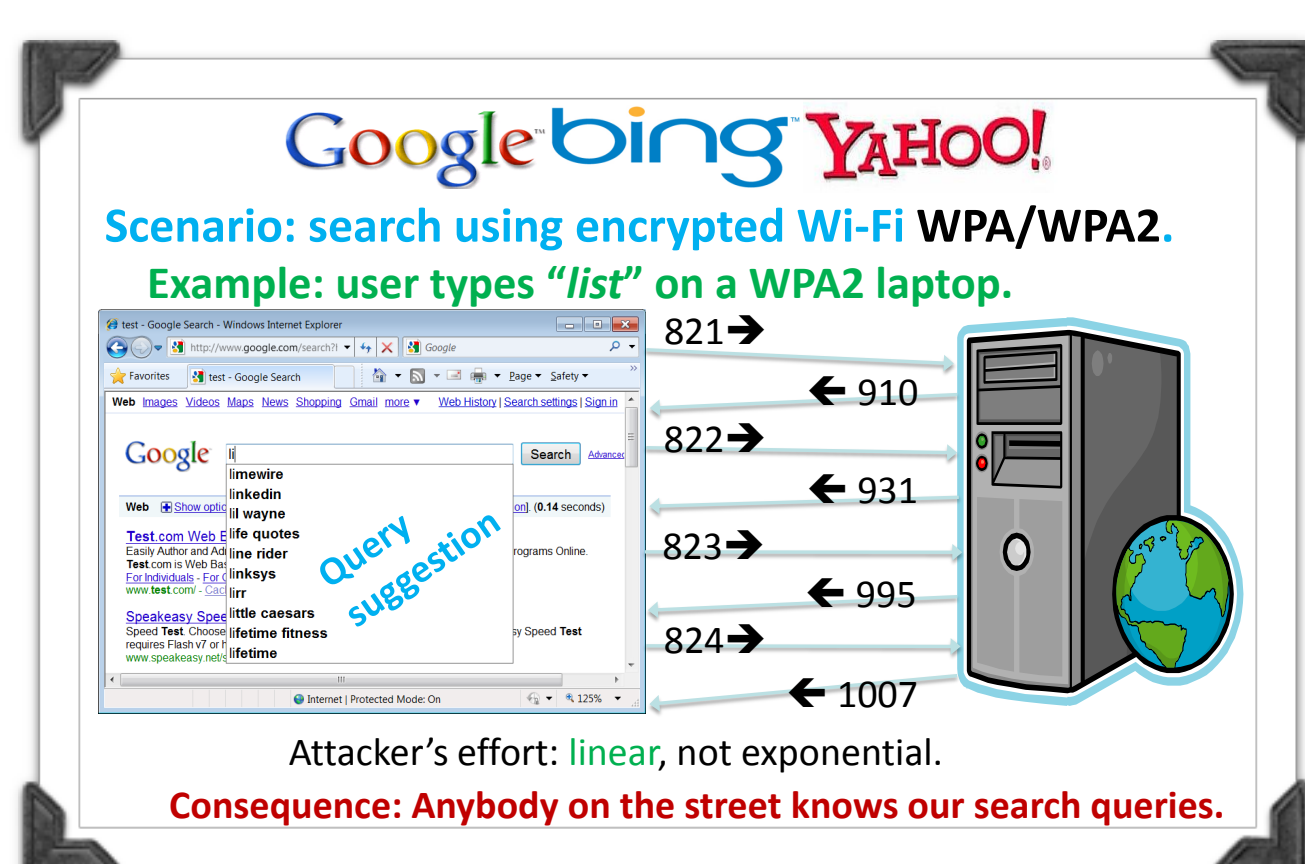
- Template Attack
- Stochastic Approach
- Support Vector Machines [1]

Non-Profiled Side-channel distinguisher

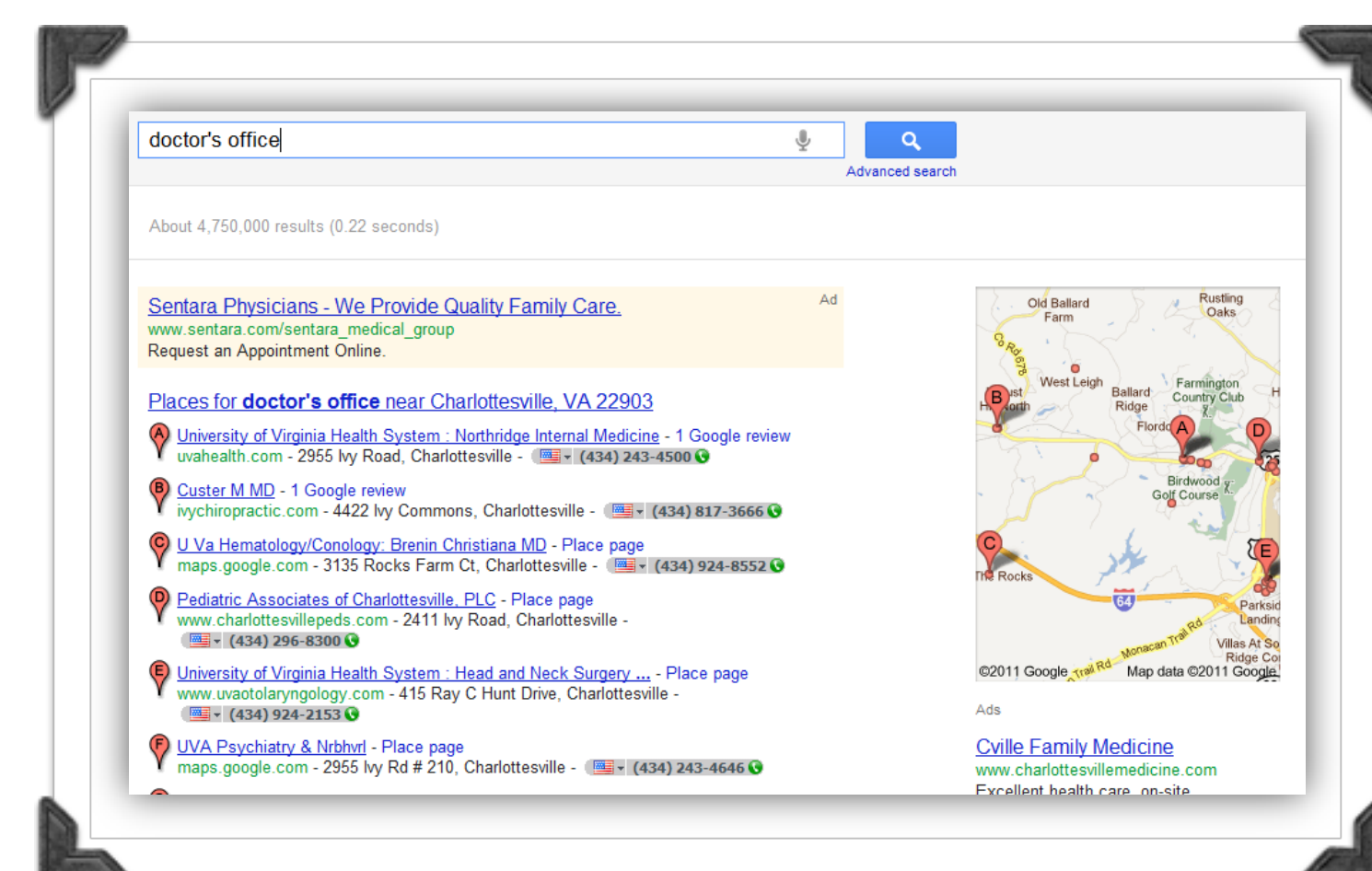
- Differential Power Analysis
- Correlation Power Analysis
- Mutual Information Analysis
- Inter-class Information Analysis [2]

“Modern” Web Side-channel attacks

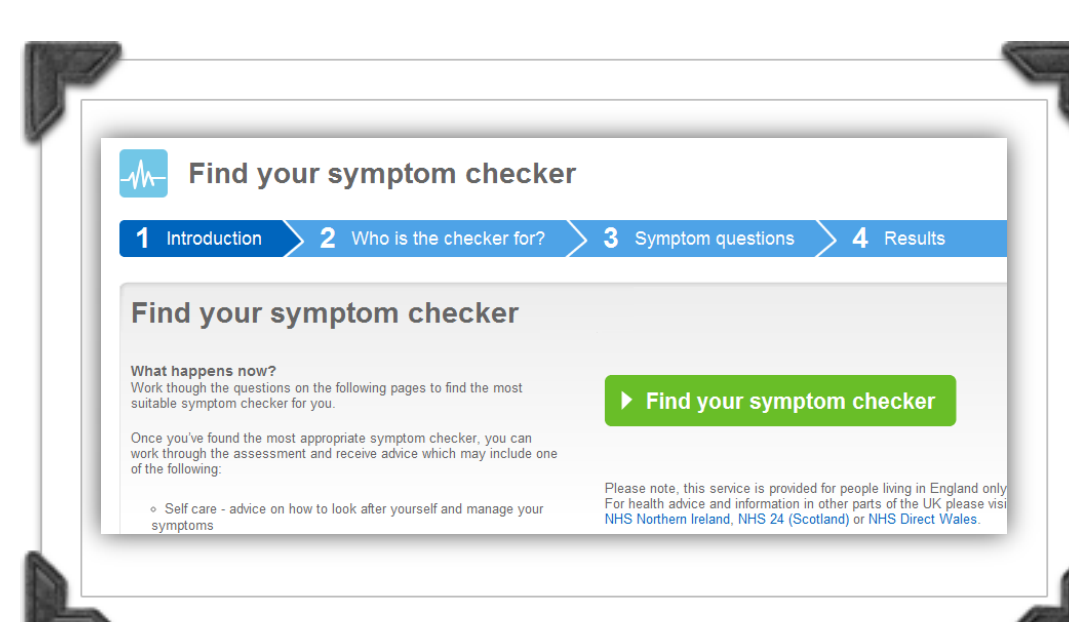
Web side-channel scenarios



[4] Kehuan Zhang Zhou Li Rui Wang 0010 XiaoFeng Wang Shuo Chen Sidebuster: automated detection and quantification of side-channel leaks in web application development. 595-606 2010 ACM Conference on Computer and Communications Security



[5] Peter Chapman and David Evans. 2011. Automated black-box detection of side-channel vulnerabilities in web applications. In Proceedings of the 18th ACM conference on Computer and communications security (CCS '11). ACM, New York, NY, USA, 263-274.



[5]

