

Recommendations in Choosing MSc Thesis Topic

Spring 2018

I would like to encourage you to do awesome practical research, studying real world problems and products.

Questions to ask yourself:

- What are my skills?
- What skills I would like to gain/improve in the MSc project?
- Which topic I would like to study better?
- Is there something I have always wanted to hack/research, but never had time for that?
- Look around: is there some practical problem I want to solve?
- Is there some security feature I want to fix or implement for some product?
- If working: can I turn my daily work into MSc thesis?

Finding inspiration for thesis topic

- Read or watch security research done in the field.
- Find a research which excites you.
- Extend or replicate the research e.g., focusing on different product or geographical location.
- Academic research to read: ACM CCS, S&P, NDSS, FC, ...
- Less formal conferences: Blackhat, DEF CON, CCC, ...
 - CCC Lightning Talks sessions could be especially useful
<https://www.youtube.com/watch?v=d2207e328d8>

Once you know what you want to research or hack on, I can help you to define the research problem to satisfy the academic requirements.

Example 1: Is Satoshi Nakamoto Estonian cryptographer?

<https://news.err.ee/652328/estonian-cryptographer-rejects-claims-alleging-he-created-bitcoin>

“An American lawyer is convinced that Estonian cryptographer Helger Lipmaa can be identified as cryptocurrency bitcoin’s creator. Lipmaa himself rejects the idea.”

Because Lipmaa did his PhD on time-stamping technology:

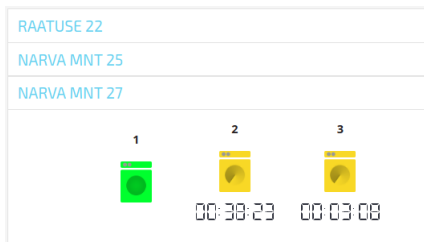
“Lipmaa says that Sobaje’s research ... missed a groundbreaking paper in the field of timestamping technology Lipmaa, Ahto Buldas, Jan Willemson, and Peeter Laud published in 1998.”

Tasks:

- Collect data of Satoshi’s public activities (e-mails from mailinglist, forum posts, ...)
- Collect data of Helger’s/Ahto’s/... public activities (e-mails, facebook/twitter posts, ...)
- Check if there is any correlation

Example 2: Washing/drying machine status in dormitory

<http://www.campus.ee/en/laundromat/>



- No status for drying machines
- No estimated time of finishing

Tasks:

- Image analysis on Raspberry Pi with camera
- Can you infer machine activity from side channels (electromagnetic emission, sound, current...)?

Think outside the box!

- Electronic engineering, building things using Arduino
- Reverse engineering: software, hardware, protocols
- Legal aspects, personal data protection practices by X
- Is there some widely used product which has not been researched?
 - Define the expected security requirements
 - Assess the product (or similar products) against the defined security requirements
 - Describe the actual threat model the product is secure against