

Master's Thesis Preparation

Empowering Users' Privacy Rights in the Internet of Things

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Last Update: January 30, 2023

Table of Contents

- 1 Introduction
- 2 State of the Art
 - Privacy Paradox
 - Differential Privacy
 - Literature Approaches
- 3 Methodology
 - Survey
 - Application
- 4 Work Plan
- 5 Conclusion and Future Work

Introduction

Internet of things (IoT) devices are everywhere. These devices create new ways of collecting and process personal data from users and non-users. Most end users are not even aware or have little control over the information that is being collected by these systems.

This work takes an holistic approach to this problem by doing:

- Systematic literature review;
- A survey;
- A mobile application.

Internet of Things



Figure: Mark Weiser [1]



Figure: Kevin Ashton [2]

Privacy Paradox

What is it?

Why even worry about privacy?

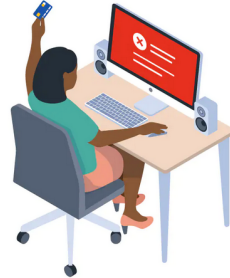


Figure: How much privacy are we willing to give up online? [3]

Differential Privacy

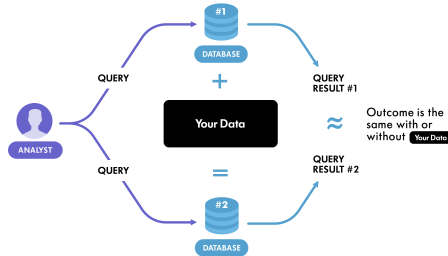


Figure: Differential Privacy [4]

Literature Approaches

- User awareness;
- Privacy through security;
- Framework proposals;
- Blockchain;

Privacy Assistants

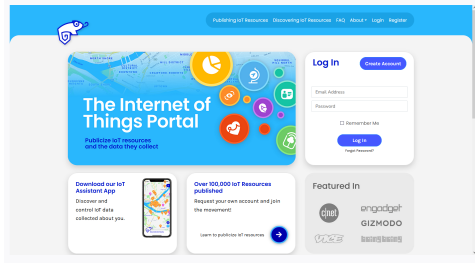


Figure: Internet of Things Portal

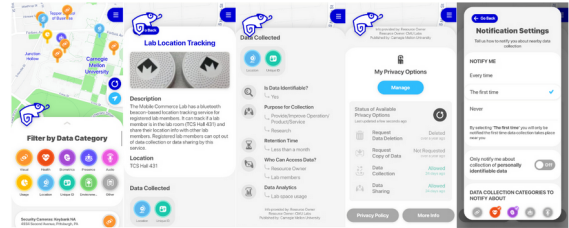
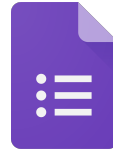


Figure: Internet of Things Assistant

Survey

92 Questions

- General knowledge and attitudes towards privacy
- Disposition for sharing personal information
- Privacy concerns
- Current online habits and practices
- Profile identification
- Knowledge and habits regarding the Internet of Things
- Demographic data



Application

Will be composed of the following things:

- Show the geolocation of the IoT devices;
- What type of device it is;
- What type of data is being collect by the device;
- Insert IoT devices and associated information about them.



Work Plan





Work plan	January				February				March				April				May			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Discovery and planning	■																			
Research enquiry	■	■	■	■	■	■	■	■	■	■	■	■								
State of the art	■	■	■	■	■	■	■	■												
Project requirements	■	■	■	■																
Wireframes and user stories					■	■	■	■												
Prototyping and refinement								■	■	■	■									
Development									■	■	■	■	■	■	■	■	■	■	■	■
Tests and iterations												■	■	■	■	■				
Release and documentation																	■	■	■	■

Table: Work plan timeline

Conclusion

This project aims to do an exploratory analysis of privacy in IoT systems. It proposes a survey to better understand user's knowledge on this subject and an application that aims to create more users awareness and better inform about their environment, as well as the IoT devices that inhabit it and how they can respond accordingly.

References

-  M. Weiser, “The computer for the 21 st century,” *Scientific american*, vol. 265, no. 3, pp. 94–105, 1991.
-  K. Ashton. (2009) That “internet of things” thing. Accessed: 2022-11-05. [Online]. Available: <https://www.rfidjournal.com/that-internet-of-things-thing>
-  C. Stouffer. (2022) The privacy paradox: How much privacy are we willing to give up online? Accessed: 2022-10-26. [Online]. Available: <https://us.norton.com/blog/privacy/how-much-privacy-we-give-up>
-  Winton. (2018) Using differential privacy to protect personal data. Accessed: 2023-01-30. [Online]. Available: <https://www.winton.com/research/>

Questions and Comments

Thank you for your attention. Any questions?