IoT challenges

State of the art

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LIGM/ESIEE Paris

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Outline

Outline

1. Context
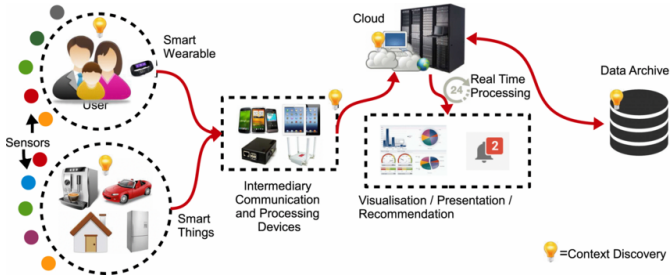
Context
Introduction

Figure 1: The IoT Platform

- ➡ Connect sensors to the gateway.[1]
- ➡ Connect the gateway to the infrastructure. [1]
- ➡ Store & Analyze sensors data.[2]

[1] jhjh

[2] P. Thubert, M. R. Palattella, and T. Engel, " 6TiSCH Centralized Scheduling: When SDN Meet IoT," in *2015 IEEE Conference on Standards for Communications and Networking (CSCN)*, 00033, Tokyo, Japan: IEEE, Oct. 2015, pp. 42–47.

Figure 2: The IoT problematics

➡ How to communicate sensors efficiently

    ➡ IEEE 802.15.4, 6LowPAN

    ➡ Throughput, Delay, Jitter, Loss rate and Availability.

➡ How to communicate sensors with the infrastructure efficiently

    ➡ LPWAN, LoraWan

    ➡ Heterogeneity ?

➡ How to extract knowledge from sensors data.

    ➡ Data mining: Classification, Clustering

    ➡ Deep learning: Machine learning

Problematic

Introduction

Figure 2: The IoT problematics

➡ How to communicate sensors efficiently

  ➡ IEEE 802.15.4, 6LowPAN
  ➡ Throughput, Delay, Jitter, Loss rate and Availability.

➡ How to communicate sensors with the infrastructure efficiently

  ➡ LPWAN, LoraWan
  ➡ **Heterogeneity ?**

➡ How to extract knowledge from sensors data.

  ➡ Data mining: Classification, Clustering
  ➡ Deep learning: Machine learning

Motivations

Introduction

- First Motivation
    - First Motivation
        - First Motivation
        - Second Motivation
    - Second Motivation
- Second Motivation
    - First Motivation
    - Second Motivation
- Third Motivation
    - First Motivation
    - Second Motivation
- Fourth Motivation
    - First Motivation
    - Second Motivation

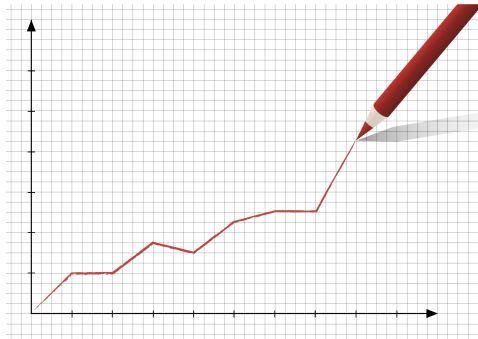

Figure 3

Goals

Introduction

- First goal
    - First goal
        - First goal
        - Second goal
    - Second goal
- Second goal
    - First goal
    - Second goal
- Third goal
    - First goal
    - Second goal
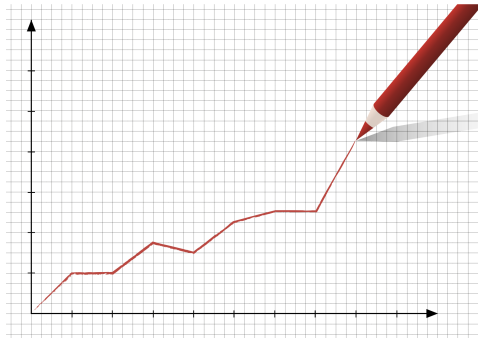- Fourth goal
    - First goal
    - Second goal

Figure 4

Challenges
Introduction

➡ First Challenge

   ➡ L'objectif est de réduire le taux de mortalité

   ➡ L'objectif est de rendre nos route plus sure

➡ Second Challenge

   ➡ Connecter les pietons et le vehicule

   ➡ augmenter la présision GPS

   ➡ réduire la latence

➡ Third Challenge

   ➡ Connecter les pietons et le vehicule

   ➡ augmenter la présision GPS

   ➡ réduire la latence

Contributions
Introduction

➡ First contribution

    ➡ Privacy settings

    ➡ Information propagation

    ➡

➡ Second contribution

    ➡ Privacy settings

    ➡ I

➡ Third contribution

    ➡ Privacy settings

    ➡ I

Outline

1. Context

Outline

State of the art

Standardization

Conclusion

Outline

Outline

Related work

Comparison

Paper	A1	A2	A3	A4

Table 1: An example table.

Related work

Comparison

Paper	A1	A2	A3	A4

Table 2: An example table.

Outline

... (step 1)
Methods

- ➡ Privacy threats
    - → Privacy settings
    - → Information propagation
    - →
- ➡ Privacy protection
    - → Privacy settings
    - → I

... (step 2)
Methods

➡ Privacy threats

  ➡ Privacy settings

  ➡ Information propagation

  ➡

➡ Privacy protection

  ➡ Privacy settings

  ➡ I

... (step 3)
Methods

- ➡ Privacy threats
    - → Privacy settings
    - → Information propagation
    - →
- ➡ Privacy protection
    - → Privacy settings
    - → I

... (step 4)
Methods

- Privacy threats
    - Privacy settings
    - Information propagation
    -
- Privacy protection
    - Privacy settings
    - I

Outline

Experimentation

➡ Privacy threats

    ➡ Privacy settings

    ➡ Information propagation

    ➡

➡ Privacy protection

    ➡ Privacy settings

    ➡ I

Outline

Results
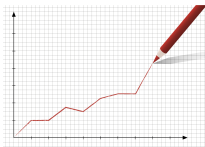
Comparison

Figure 5
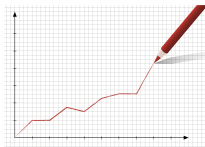
Outline

Conclusion

Figure 6: Cag.

Figure 8: Cag.
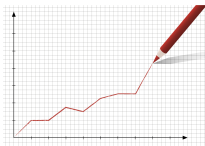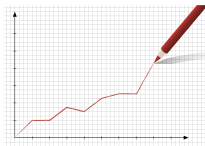

Figure 7: Cag.

Figure 9: Cag.

Challenges
Conclusion

➡ Privacy threats

    ➡ Privacy settings

    ➡ Information propagation

    ➡

➡ Privacy protection

    ➡ Privacy settings

    ➡ I

Outline

Outline

Paper	A1	A2	A3	A4

Table 3: An example table.

Related work

Comparison

Paper	A1	A2	A3	A4

Table 4: An example table.

Outline

... (step 1)
Methods

➠ Privacy threats

  ➟ Privacy settings

  ➟ Information propagation

  ➟

➠ Privacy protection

  ➟ Privacy settings

  ➟ I

... (step 2)
Methods

- ➡ Privacy threats
    - ➡ Privacy settings
    - ➡ Information propagation
    - ➡
- ➡ Privacy protection
    - ➡ Privacy settings
    - ➡ I

... (step 3)
Methods

- Privacy threats
    - Privacy settings
    - Information propagation
    -
- Privacy protection
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    - I

... (step 4)
Methods

➧ Privacy threats

   ➙ Privacy settings

   ➙ Information propagation

   ➙

➧ Privacy protection

   ➙ Privacy settings

   ➙ I

Outline

Experimentation

Experimentation

- ➠ Privacy threats
    - ➜ Privacy settings
    - ➜ Information propagation
    - ➜
- ➠ Privacy protection
    - ➜ Privacy settings
    - ➜ I

Outline

Results

Comparison
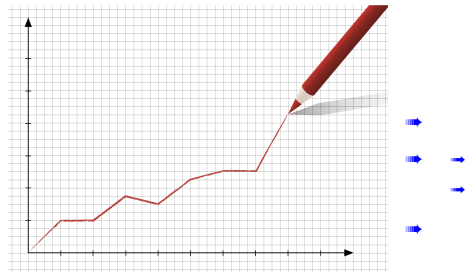
Figure 10

Outline

Conclusion

Figure 11: Cag.

Figure 13: Cag.

Figure 12: Cag.

Figure 14: Cag.

Challenges
Conclusion

➡ Privacy threats

    ➡ Privacy settings

    ➡ Information propagation

    ➡

➡ Privacy protection

    ➡ Privacy settings

    ➡ I

Outline

Conclusion

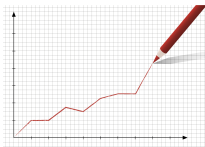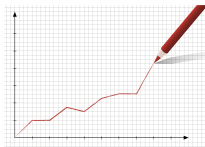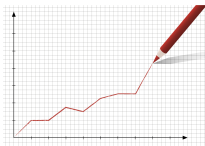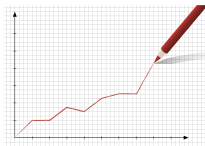| Routing protocol	Control Cost	Link Cost	Node Cost
OSPF/IS-IS	✗	✓	✗
OLSRv2	?	✓	✓
RIP	✓	?	✗
DSR	✓	✗	✗
RPL	✓	✓	✓

Table 5: Routing protocols comparison _**rpl2**_

Application protocol	Rest-Full	Transport	Publish/Subscribe	Request/Response	Security	QoS	Header size (Byte)
COAP	✓	UDP	✓	✓	DTLS	✓	4
MQTT	✗	TCP	✓	✗	SSL	✓	2
MQTT-SN	✗	TCP	✓	✗	SSL	✓	2
XMPP	✗	TCP	✓	✓	SSL	✗	-
AMQP	✗	TCP	✓	✗	SSL	✓	8
DDS	✗	UDP TCP	✓	✗	SSL DTLS	✓	-
HTTP	✓	TCP	✗	✓	SSL	✗	-

Table 6: Application protocols comparison

Conclusion

Routing protocol	Control Cost	Link Cost	Node Cost
OSPF/IS-IS	✗	✓	✗
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DDS	✗	UDP TCP	✓	✗	SSL DTLS	✓	-
HTTP	✓	TCP	✗	✓	SSL	✗	-

Table 6: Application protocols comparison

Thank you !

Challenges
Conclusion

➡ Privacy threats
  ➡ Privacy settings
  ➡ Information propagation
  ➡

➡ Privacy protection
  ➡ Privacy settings
  ➡ I

➡ Privacy threats

    ➡ Privacy settings

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    ➡

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Thank you !

References

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