# UiO **:** Universitetet i Oslo

# Master Studies at UiO, focus:

# Security in Information Systems and Internet of Things (IoT)

Josef Noll, Christian Johansen, Olaf Owe, Toktam Ramezani, Elahe Fazeldehkordi, Seraj Fayyad, Maghsoud Morshedi, Manish Shestra,…...

http://ITS-wiki.no

# "Our Journey of Today"

- "The last time we were connected by wire was at birth!" [Motorola]

- Main Areas
  - ➡ Security and Privacy in  IoT
  - ➡ Change of Business Models

- related to projects:
  - ➡ Security in IoT for Smart Grids: IoTSec.no
    Secure Trusted IoT: SCOTT.IoTSec.no,
    Diversity in IoT Security: DiversIoT.IoTSec.no

Master @ UiO

# Area 1:

# Security and Privacy in IoT

- Car industry: Liability in IoT driven business models
- Energy: Cost of providing of Energy -> Cost of Reliable Network
- Telecom:

**The change of Business Models**

# Background: Mobility

**Challenging Research**
- 5G = Heterogeneous Networks
- Small Cells
- Indoor communication
- Virtual Networks
- Internet of Things
- Privacy

FOTO: HEIKO JUNGE/SCANPIX

# - Mobilnettet vil svikte igjen

Endelig har Telenor funnet ut hva som gikk galt da nettet brøt sammen, men professor og mobilekspert Josef Noll tror ikke vi har sett slutten på Telenors problemer.

# Addressing the Threat Dimension for IoT

- Hollande (FR), Merkel (DE) had their mobile being monitored

- «and we believe it is not happening in Norway?

18. Dezember 2014, 18:14 Uhr   Abhören von Handys

## So lässt sich das UMTS-Netz knacken



[source: Süddeutsche Zeitung, 18Dec2014]

Zwei Hacker zeigen
UMTS-Antenne lassen
sich knacken (Foto dpa)



[source: www.rediff.com]

# Building the Norwegian Smart Grid Security Centre
# IoTSec.no

| Home | Research Areas | Security Centre | Publications | About us |

The IoTSec - **Security in IoT for Smart Grids** initiative was established in 2015 to promote the development of a safe and secure Internet-of-Things (IoT)-enabled smart power grid infrastructure. The Research Project received funding from the Research Council of Norway (RCN) to contribute to a safe information society.

IoTSec addresses the basic needs for a reliable and efficient, uninterrupted power network with dynamic configuration and security properties. It addresses in addition the needs of businesses and end users of additional IoT services by exploring use cases for value-added services with the intent to design the building blocks for future services that consider the necessary security and privacy preconditions of successfully deployed large-scale services. IoTSec will apply the research in the envisaged Security Centre for Smart Grids, co-located with the Norwegian Centre of Excellence (NCE Smart).

## About

The IoTSec initiatives drives Research for secure IoT and Smart Grids

#iotsecno

Josef Noll
@josefnoll                        Nov

NCE Smart Partnerkonferansen @KrstinHalvorsen og Nasjonal ... er for Sikkerhet i SmartGrid #IoT...
pic.twitter.com/FLLua94

«Open World Approach»
*everything that is not declared closed is open*

Norge
Norway
Gjøvik
Kjeller
Oslo
Halden

Economics in IoT

**Partners and Collaborations**

- UiO
- UNIK
- NR
- Simula
- NTNU

Academia

- Smart Innovation Østfold
- eSmart Systems
- Fredrikstad Energi
- EB Nett
- Movation

Industry

- Smartgrid Centre
- Norw. Data Protection Auth.
- Forbrukerrådet

Interest Org.

- EyeSaaS
- mnemonic

Industry

- Mondragon Unibersitatea
- University of Victoria
- Universidad Carlos III
- La Sapienza
- COINS Research School
- Nimbeo
- H2020 and ECSEL projects

International

6

# Area 2:

# The change of Business Models

- Car industry: Liability in IoT driven business models
- Energy: Cost of providing of Energy -> Cost of Reliable Network
- Telecom: uO (MicroOperator), Partnership

http://www.scmagazine.com/iot-security-forcing-business-model-changes-panel-says/article/448668/

## Volvo to 'accept full liability' for crashes with its driverless cars

But decide on rules so we can make the dang vehicles



SC Magazine > News > IoT security forcing business model changes, panel says

Teri Robinson, Associate Editor

Follow @TeriRnNY

October 22, 2015

# IoT security forcing business model changes, panel says

Share this article:

To secure the Internet of Things and to build trust with customers, the way that vendors approach manufacturing, distributing and supporting devices and solutions must change, a panel of security pros said Monday at the National Cyber Security Alliance's (NCSA's) Cybersecurity Summit held at Nasdaq.

"Business models will have to change. We used to build them [products], ship them and forget about them until we had to service them," said John Ellis, founder and managing director of Ellis & Associates. "We've moved to a new world where we have to ship and remember."

OUT-LAW.COM

68    22    78

ability" for collisions involving its autonomous vehicles, the company has

# The "sharing economy" for energy companies?



Ved å bygge internett for alle, og ved å skape relevante og uunnværlige digitale tjenester, kan vi bidra til en bedre verden, skriver Sigve Brekke.
📷 FOTO: Heiko Junge, NTB scanpix

**IKT er den nye oljen! | Sigve Brekke**

[Source: aftenposten.no]

**Sharing Economy: "Telenor will create a digital ecosystem in Pakistan"**



**eSmart:labs**

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## Prosumer bidding and scheduling in electricity markets

🕐 12. January 2016          📁 Ukategorisert          👤 Administrator

[Source: eSmartSystems.com]

# Conclusions

- Things (IoT) are driving the digital societies
- Main areas for a Master Thesis
  - Security and Privacy in IoT
    - IoTSec.no, Privacy Label
  - Change in Business models
    - Liability, Quality of supply,
- Related to
  - Security in IoT for Smart Grids: IoTSec.no
  - Secure Trusted IoT: SCOTT.IoTSec.no,
  - Diversity in IoT Security: DiversIoT.IoTSec.no
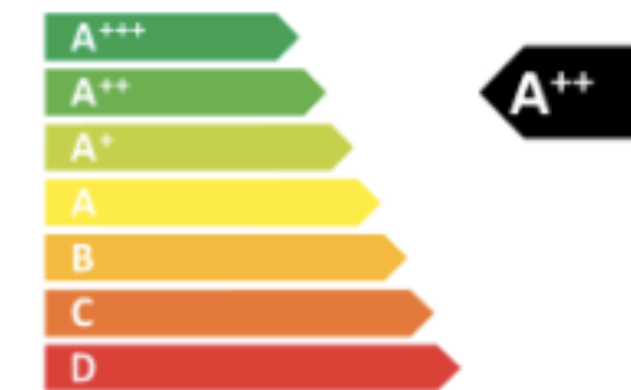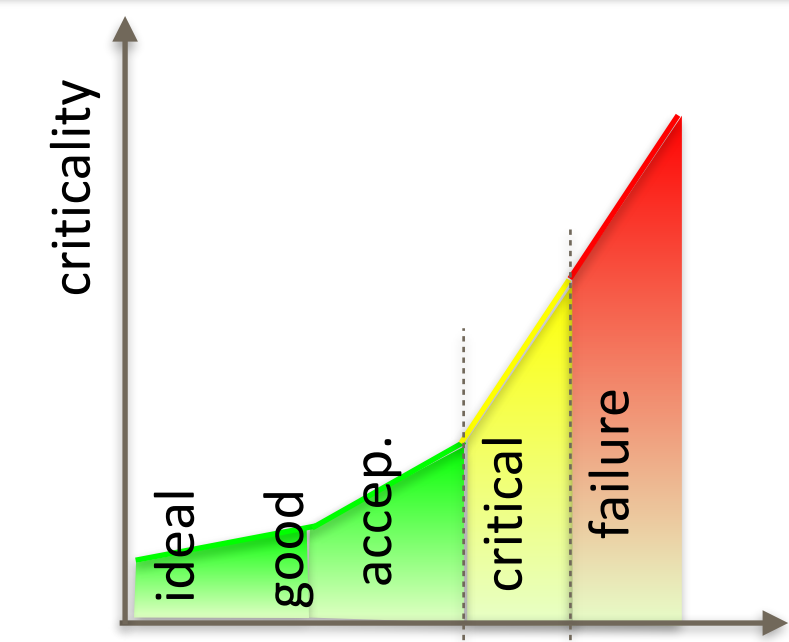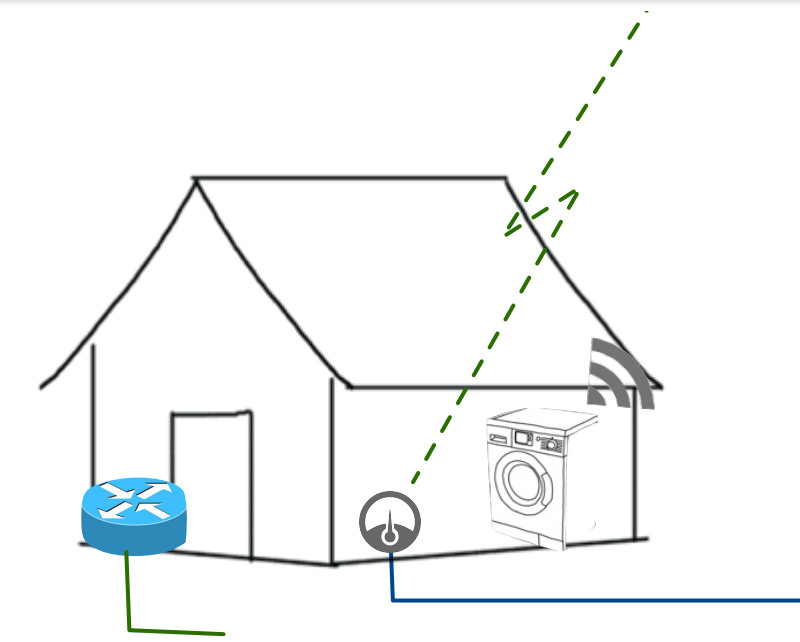
| SPD level | SPD vs SPD$_{Goal}$ |
|-----------|---------------------|
| (67,61,47) | (🔴, 🟡, 🟢) |
| (67,61,47) | (🔴, 🟡, 🟡) |
| (31,33,63) | (🔴, 🟡, 🟡) |