

# Internet of Things (IOT) Applications

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# Outline

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- **Goals, Motivations, Challenges**
- **Overview**
- **Background and Related Research**
- **Overview of tasks**
- **Activities and outcomes**
- **Deliverables**

# Goals, Motivation, Challenges

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## ■ Project Goals

- Design, build, evaluate, and validate a multi-layer security framework to build highly secure and trustworthy IoT applications

## ■ Motivations

- Create holistic cybersecurity solutions instead of using ad-hoc approaches for each IoT application.
- Apply Anomaly Behavior Analysis.
- Create an standardize IoT threat model.

## ■ Challenges

- Performing fusion of multiple-level Intrusion Detection System.
  - Trade-off between detection rate and false alarms.

# Overview

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**The Internet of Things (IoT) will connect not only computers and mobile devices, but it will also interconnect smart buildings, homes, and cities.**

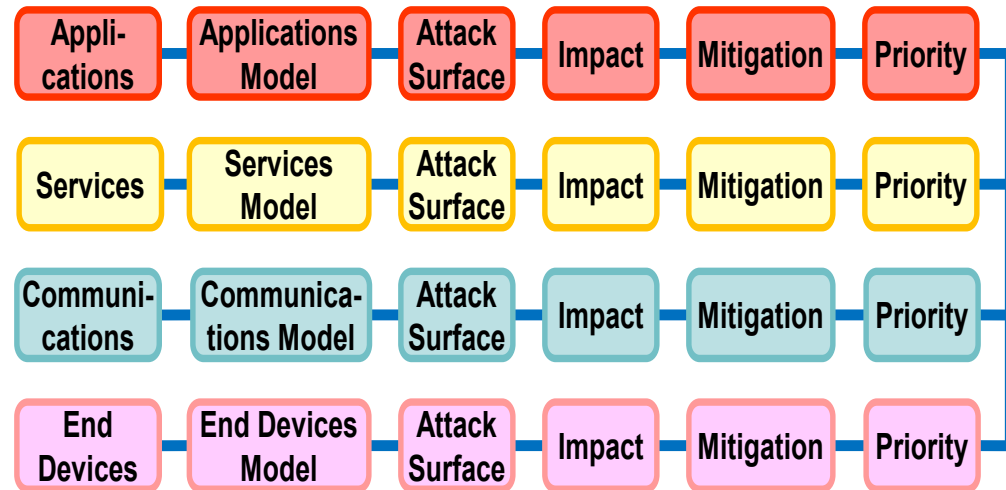
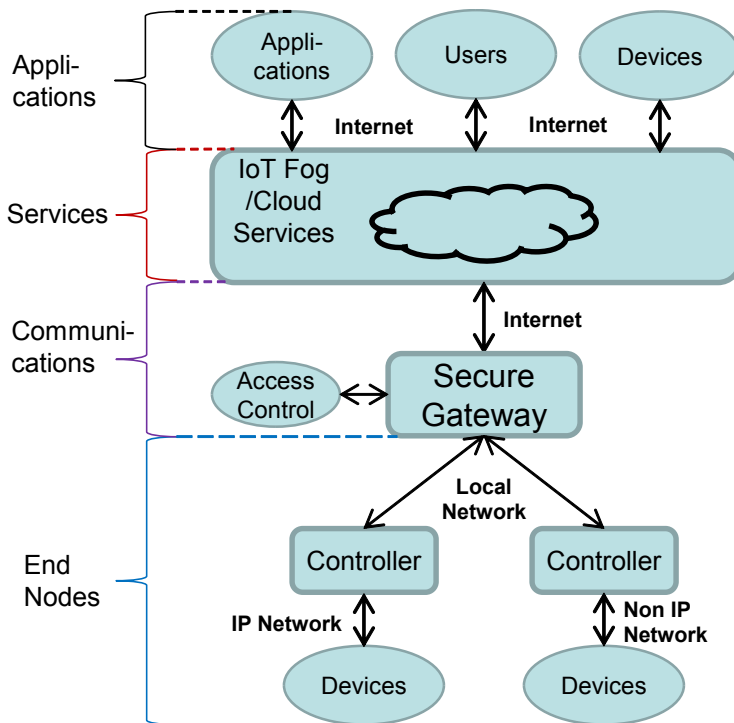
**-IoT will lead to the development of a wide range of advanced information services that are:**

- Pervasive, Cost-effective, and can be accessed from anywhere and at any time.**

**-IoT applications will introduce grand security challenges due to the increase in the attack surface.**

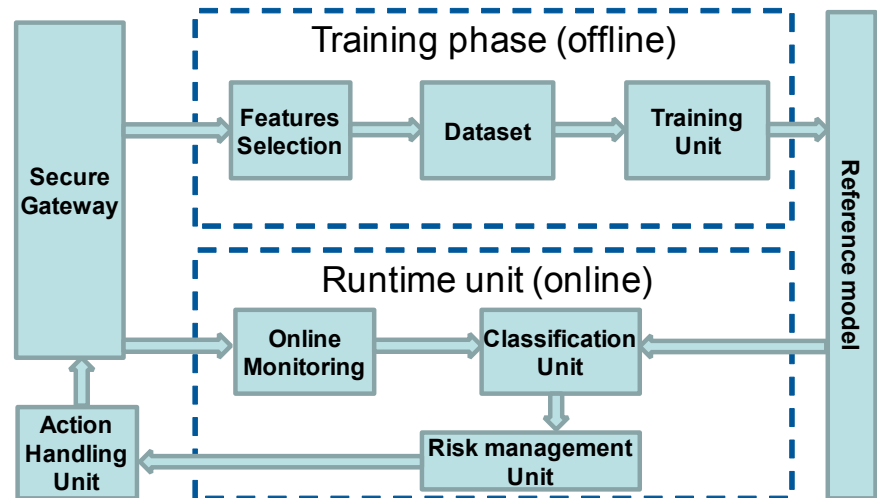
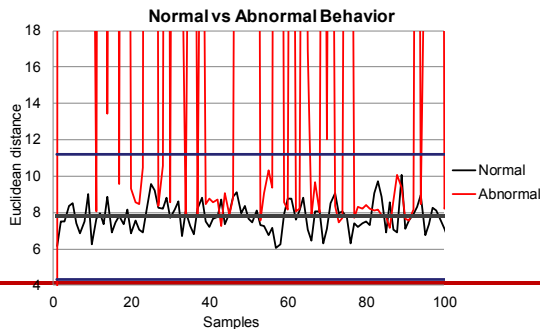
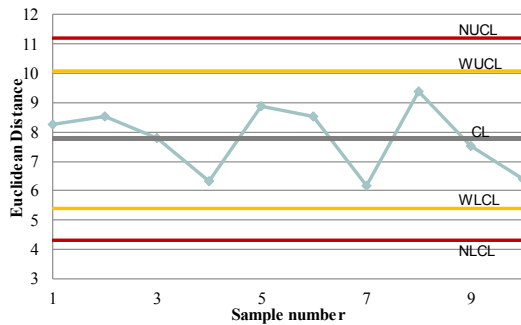
# Overview

We propose a security framework to deploy highly secure IoT applications for Smart Infrastructures. Our approach is based on an Anomaly Behavior Analysis methodology to detect any type of attack (known or unknown).



# Background and Related Research

- We have developed individual solutions for each layer in our approach.
- We developed a mechanism to identify when an IoT sensor has been compromised (DWT) as well as to identify when a gateway has been compromised (AC).



# Overview of Tasks

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- ❑ **Apply ABA methodology to each framework layer**
- ❑ **Develop fusion of the ABA results produced by each layer**
- ❑ **Mitigation methods and Risk management**
- ❑ **Demonstrate the application of the framework to secure and protect IoT applications.**

# Activities and outcomes

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- **Activities**

- Apply ABA methodology to each framework layer
  - Develop fusion of the ABA results produced by each layer
- Mitigation methods and Risk management

- **Outcomes**

- IoT cybersecurity framework
- A tested resilient IoT application (e.g., Smart Building)



# Deliverables and benefits

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- **Deliverables**

- Tools to secure and protect the operations performed by each IoT layer
- Procedures to process context-based information.

- **Benefits**

- Procedures for creating new and secure IoT applications
- Better control and visualization of IoT information/services behavior
- A standardize IoT security framework.

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Questions?

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