# DESIGNING IOT SYSTEMS FOR SMART COMMUNITIES

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Denis Conan
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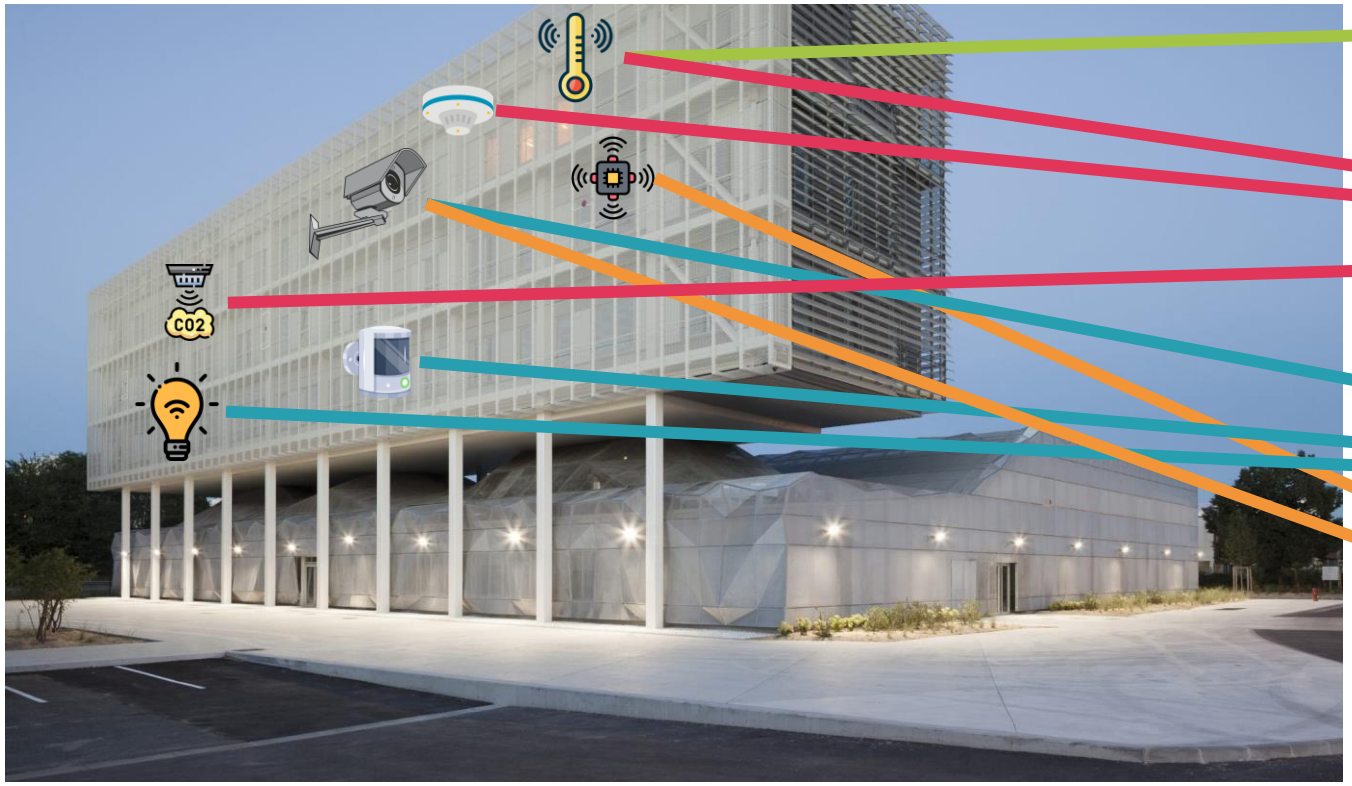
# DESIGNING IOT SYSTEMS FOR SMART COMMUNITIES




Temperature Monitoring

Fire Detection

Occupancy Monitoring

Intrusion Detection

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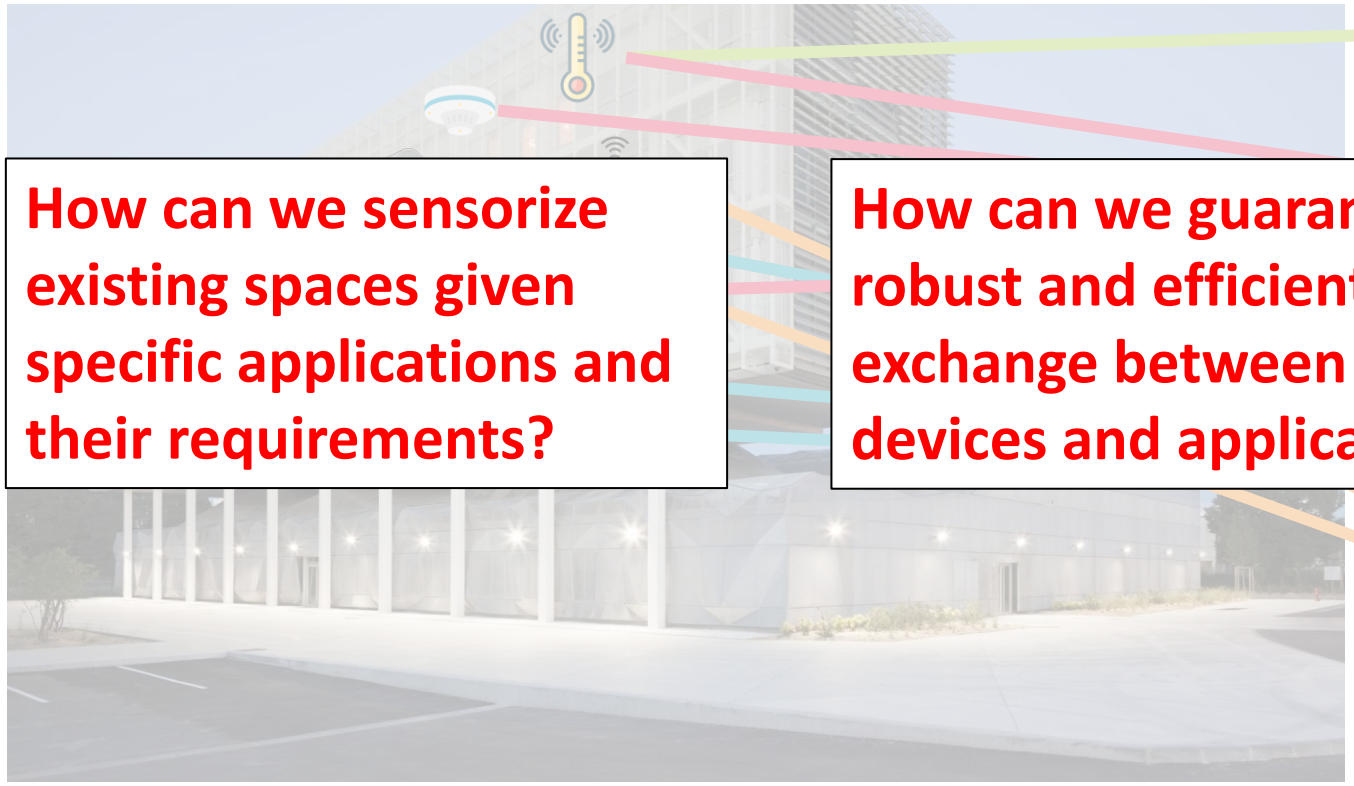


**How can we sensorize existing spaces given specific applications and their requirements?**

**How can we guarantee robust and efficient data exchange between IoT devices and applications?**

**How can we design adaptive IoT systems in highly dynamic environments?**

Temperature Monitoring

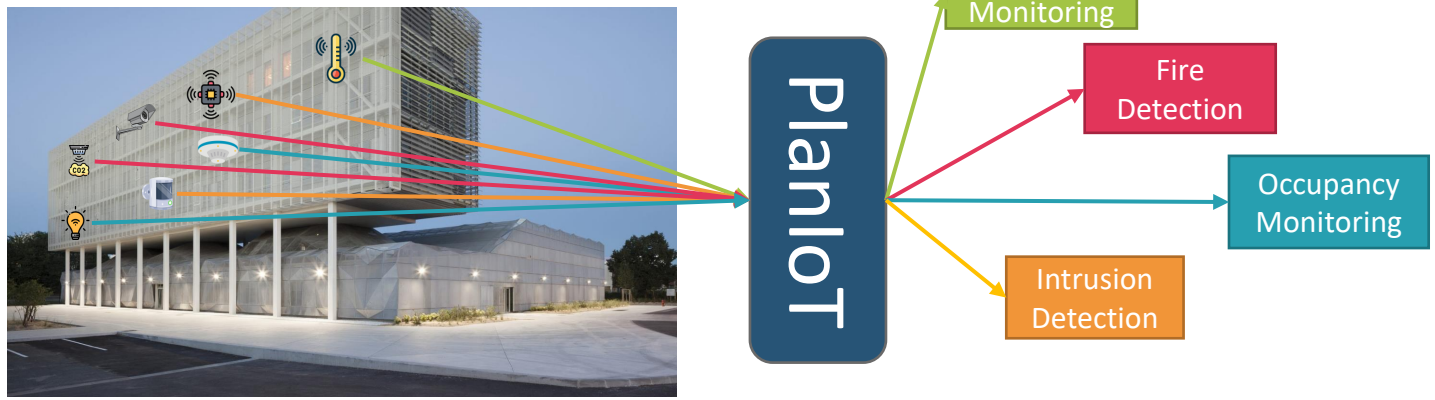
Monitoring

Intrusion Detection

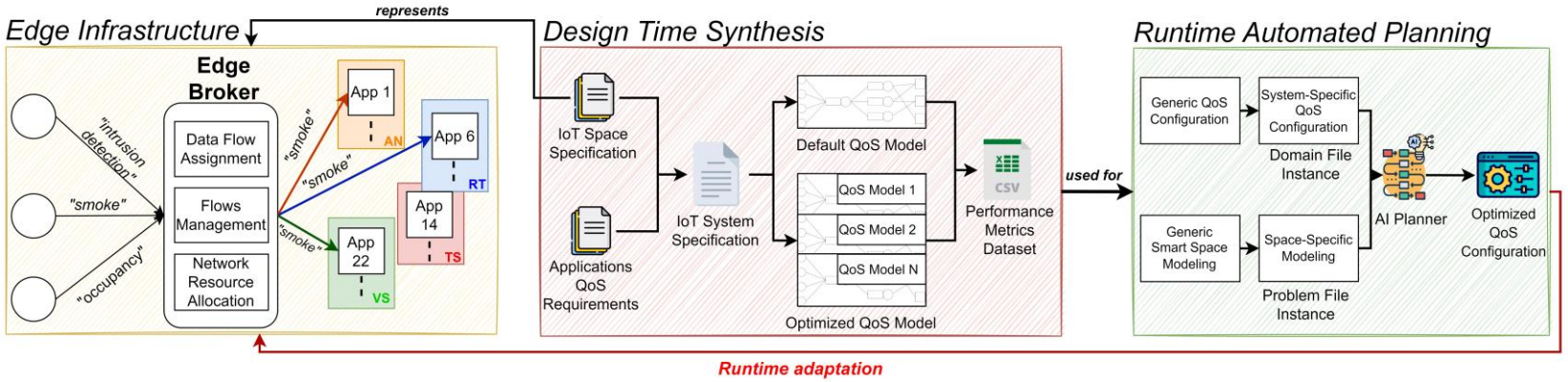
# PLANIOT

*18th IEEE/ACM International Symposium On Software Engineering For Adaptive And Self-managing Systems (SEAMS'23)*

## A FRAMEWORK FOR ADAPTIVE DATA FLOW MANAGEMENT IN IOT-ENHANCED SPACES





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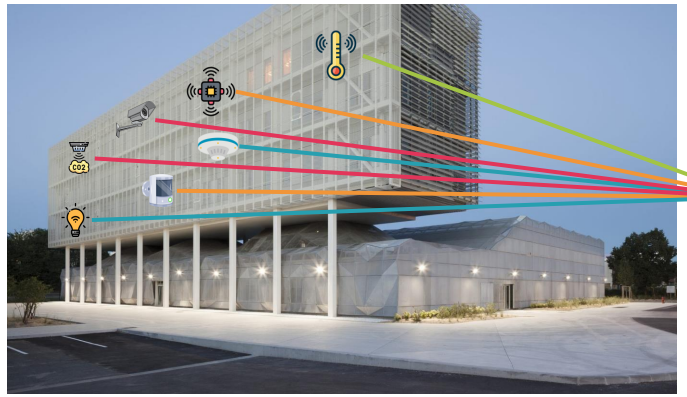
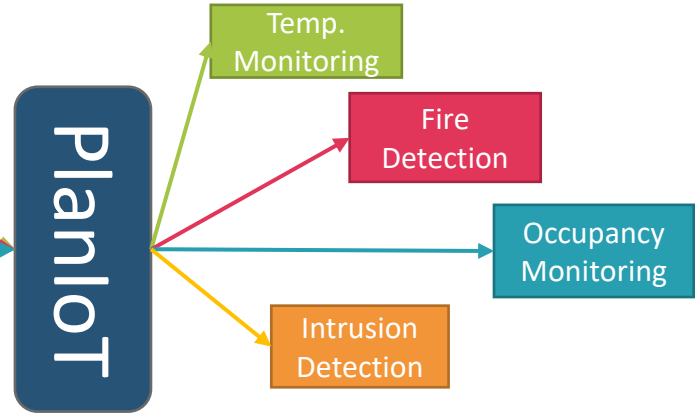
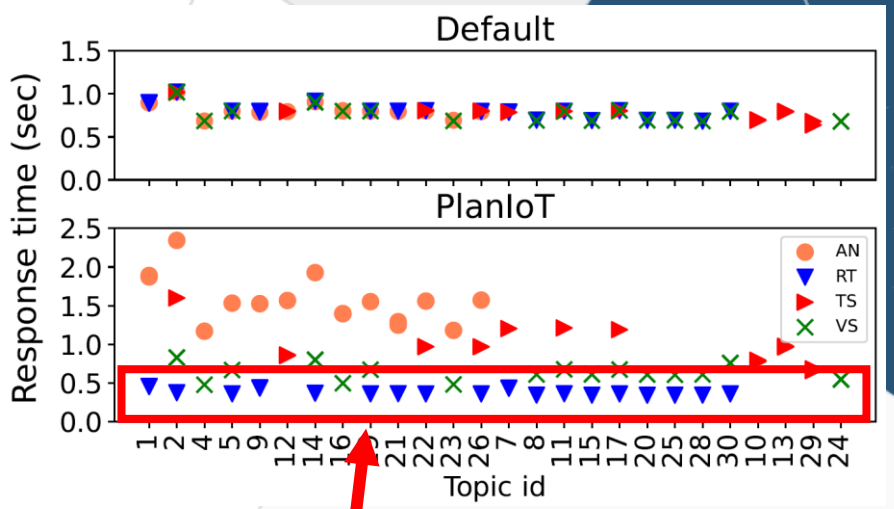
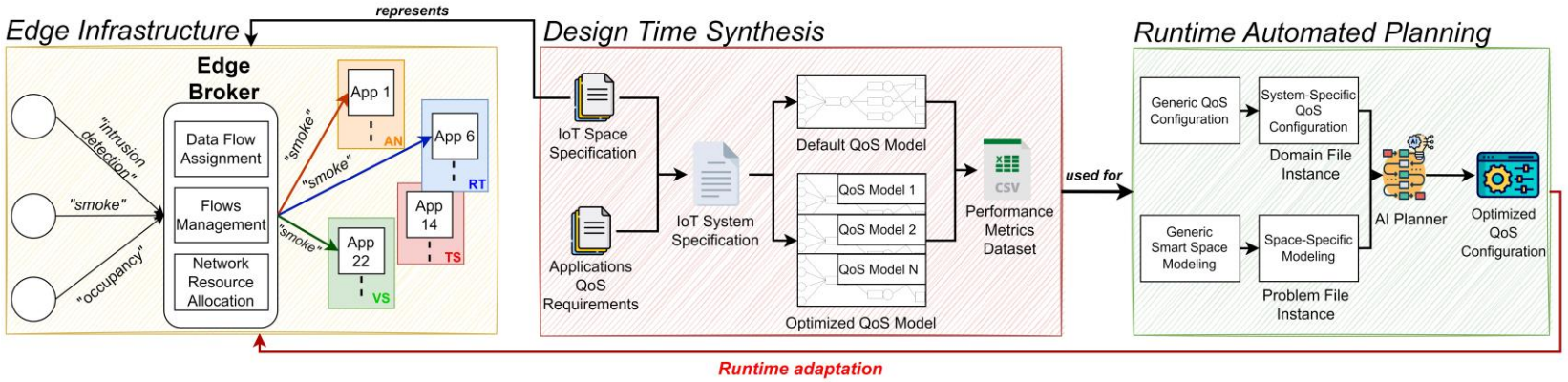





**> 50% improvement for time-sensitive applications**

TRY IT OUT!

Institut Mines-Télécom

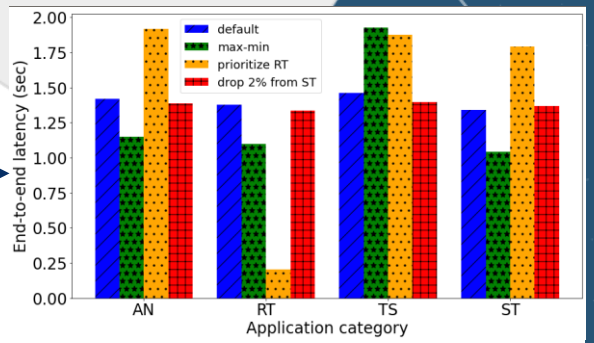
# EDICT *(Under review at DCOSS-IoT'23)*

## SIMULATION OF EDGE INTERACTIONS IN IOT-ENHANCED SPACES

***NGSI-LD representation***

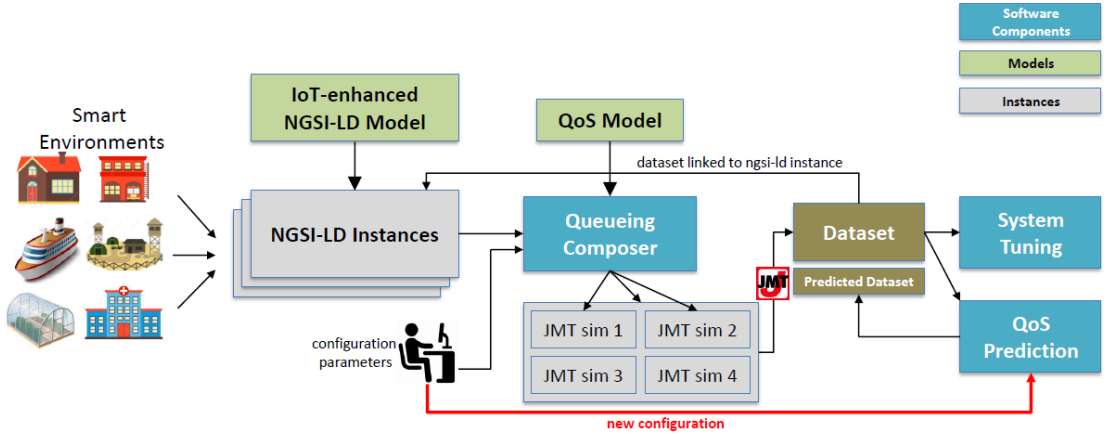
EDICT

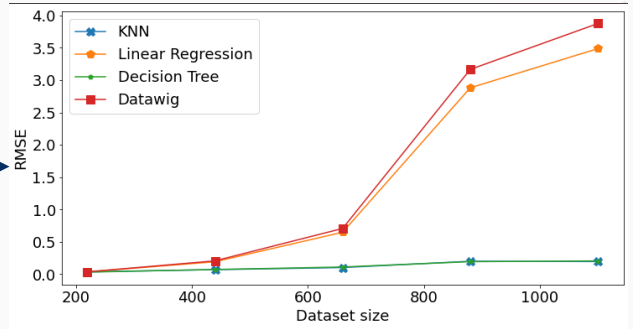
**Metrics Dataset**




**Performance Evaluation**

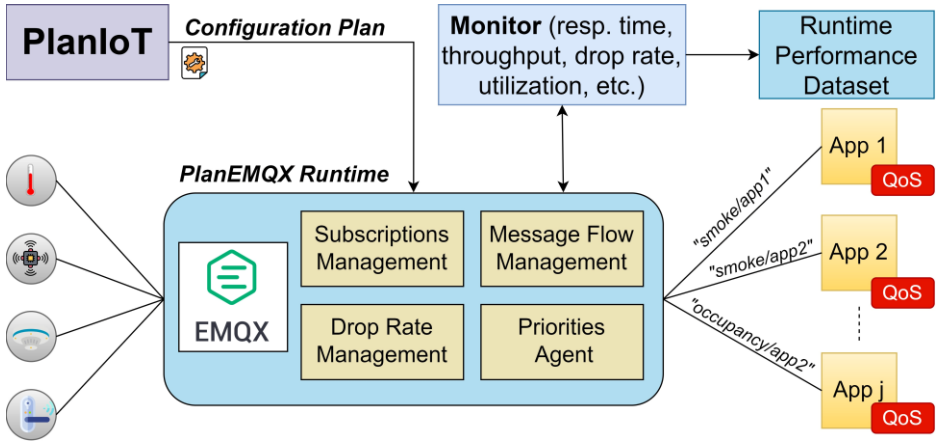
**Performance Prediction**



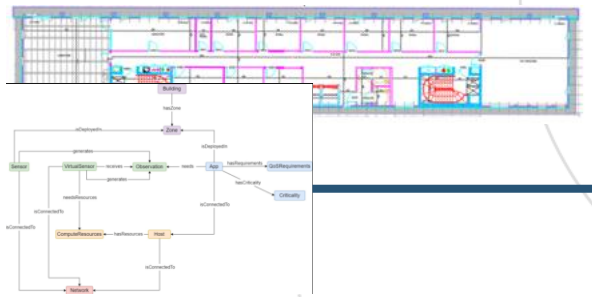



# ONGOING WORK

## PlanEMQX: An AI-enabled Message Broker for IoT-enhanced Spaces

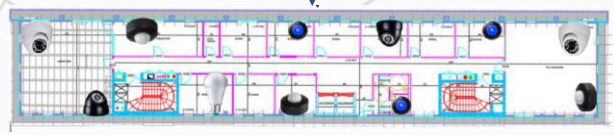



## A QoS-aware Approach for IoT Infrastructure Placement



NGSI-LD Model

RL-based QoS-aware IoT Infrastructure Placement



Sensorized IoT Environment

**Thesis Goal: An End-to-End Solution For Designing and Implementing Autonomous IoT Systems.**

## Publications:

- **H. Hajj Hassan**, G. Bouloukakis, A. Kattepur, D. Conan, D. Belaïd. " PlanIoT: A Framework for Adaptive Data Flow Management in IoT-enhanced Spaces". *18th IEEE/ACM International Symposium On Software Engineering For Adaptive And Self-managing Systems (SEAMS'23) – Core Rank A*
- **H. Hajj Hassan**, G. Bouloukakis, A. Kattepur, D. Conan, D. Belaïd. "Artifact: Implementation Of An Adaptive Flow Management Framework For IoT Spaces". *18th IEEE/ACM International Symposium On Software Engineering For Adaptive And Self-managing Systems (SEAMS'23) – Core Rank A*
- **H. Hajj Hassan**, G. Bouloukakis, A. Kattepur, D. Conan, D. Belaïd. EDICT: Simulation of Edge Interactions across IoT-enhanced Environments. *The 19th International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT'23)*. Under Review.