

## Laboratory of Parallel, Embedded architectures and Intensive Computing of University Oran 1

(LAPECI : <https://www.lapeci-dz.org/index.php>)

Organizes

### Thematic days on IoT, Big data and Real-time data processing

May 26-27, 2025

University Oran1

- These thematic days are dedicated to exploring the **latest innovations** in the **Internet of Things (IoT)**, **Big Data**, and **real-time** data processing. Through a blend of theoretical sessions and hands-on **workshops**, participants will gain **practical experience** working with **time-series data** from **IoT sensors** and discover advanced tools for **real-time monitoring** and **decision-making**.
- At this event, an advanced platform for **real-time processing** of **IoT sensor** data will be presented, with a specific focus on **agricultural** applications. The main purpose is to introduce **IoT data** collection methods using sensors, **ESP32**, **Arduino**, **Raspberry Pi**. The **WALLeSmart** project will also be presented, showing how **Big Data**, **Cloud Computing** and **IoT** can revolutionize digital agriculture by improving farm **management** and **traceability**.
- In addition, the National Research Program project '**EUB-AGR**\*: Integrated, efficient and intelligent management of bio-treated wastewater for agriculture' will be presented. A **prototype IoT** platform for **real-time monitoring** of **wastewater** quality will be presented.

#### Organization committee:

- |                             |                   |
|-----------------------------|-------------------|
| • Abdeldjalil AIDI          | • Bakhta AMRANE   |
| • Abou El Hassane BENYAMINA | • Walid BENZINEB  |
| • El Abbassia DEBA          | • Lakhdar LOUKIL  |
| • Kheira MECHACHE           | • Karima MOKHTARI |
| • Lougmiri ZEKRI            | • Sarah BALBOUZI  |



Saïd MAHMOUDI

Professor at University of Mons,  
Faculty of Engineering,  
Computer Science department.



Nouredine BENDJELLOUL

Master's in Information Systems  
Engineering and a **Research engineer** in the ILIA team.

#### Monday, May 26th, 2025

08:15 – 09:00 Reception and registration

09:00 – 09:30 Opening allocation:  
 • Pr BENYAMINA Abou El Hassane : LAPECI lab director  
 • Pr LOUKIL Lakhdar, Chairman of the workshop organizing committee  
 • Pr HAMADOUCHE Mohammed, Dean of the Faculty of Exact and Applied Sciences

09:30 – 11:00 (1h30) Pr. Said MAHMOUDI, University of Mons, Belgium  
 • Introduction to IoT and data collection techniques at scale.

11:00 – 11:15 (15min) Coffee Beak

11:15 – 12:15 (1h00) Pr. Said MAHMOUDI, University of Mons, Belgium  
 • Presentation on the challenges of Smart Farming and the exploitation of agricultural data.

12:30 – 14:00 (1h30) Lunch Break

14:00 – 15:30 (1h30) Pr. Said MAHMOUDI, University of Mons, Belgium  
 • Presentation of WALLeSmart's technical architecture.  
 • Real-time demonstration: collection, processing, and analysis of IoT sensor data.  
 • Case studies: resource optimization and traceability of agricultural production.

15:30 – 15:45 (15min) Coffee Beak

#### Practical workshop

15:30 – 17:30 (2h00)

Dr. Nourredine BENDJELLOUL, University of Mons, Belgium  
 • Deployment of a Big Data processing infrastructure tailored to the agricultural sector.  
 • Real-time data manipulation: ingestion, storage, visualization, and advanced analysis.

#### Tuesday, May 27th, 2025

09:00 – 10:30 (1h30)

Pr. BENYAMINA Abou El Hassane : LAPECI lab director  
 • Presentation of LAPECI's international and intersectoral projects.

Pr. Lakhdar LOUKIL  
 • Presentation of the project 'Integrated, efficient and intelligent management of bio-treated wastewater intended for agriculture (EUB-AGR)', National Research Program (PNR), 2023-2025.  
 • Presentation of the architecture of an IoT platform for wastewater monitoring. Application to the Mascara wastewater treatment plant.

10:30 – 10:45 (15min)

Coffee Beak

10:45 – 12:45 (2h30)

- Dr. Nourredine BENDJELLOUL, University of Mons, Belgium  
 • Real-time data manipulation: ingestion, storage, visualization, and advanced analysis (continued).  
 • Experimentation on real-life scenarios and feedback.

12:45 – 14:15 (1h30)

Lunch Break

14:15 – 15:30 (1h15)

- **Round table and closing of the thematic days.**

\*This event is partly funded by the National Research Project project 'EUB-AGR'.

