



R&I



AGRICULTURAL INTERNET OF THINGS AND DATA ANALYTICS TO MAKE BETTER DECISIONS IN THE PRECISION AGRICULTURE CONTEXT (AglOT)

Red Temática Iberoamericana CYTED

2020

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Wireless Networks Research Lab

Universitat Oberta de Catalunya

<http://wine.rdi.uoc.edu/>

Universitat Oberta de Catalunya



- Pioneers in online education (since 1995)
- +73.000 students
- +90.000 alumni
- Located in Barcelona, Catalonia, Spain
- Students in 134 countries



WiNe in 2020*



- 6 academics at the Computer Science Department
- 4 Postdoctoral fellows
- 4 full time PhD students
- 1 research engineer
- + several collaborating students and external researchers



Our Lab Goal

Basic
Human
Needs



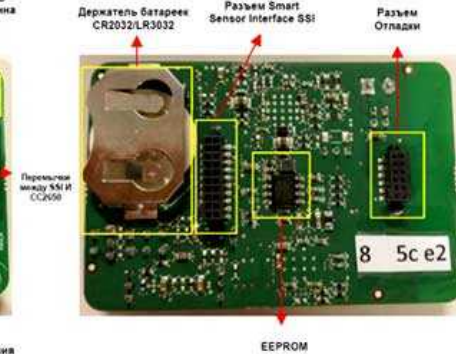
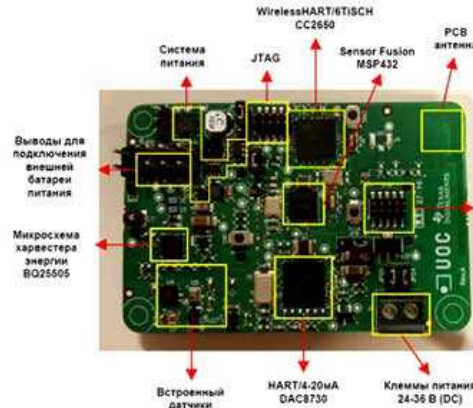
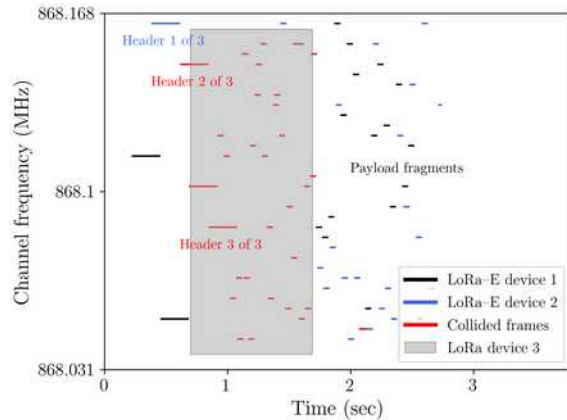
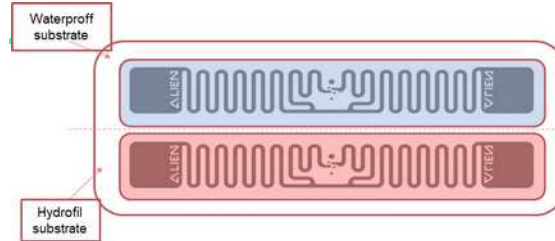
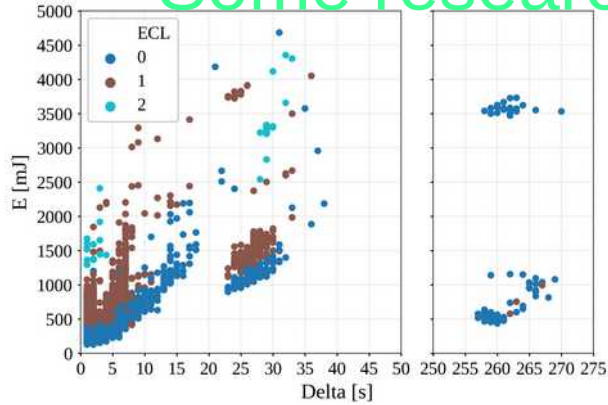
Research Lines

- Wireless Communications technologies
 - Evolution of LPWANs and satellite networks
 - Passive/Backscattering communications
 - 5G architectures and enterprise cellular
 - mmWave ad-hoc networking
- Passive sensorics and computation
 - Passive low cost sensors (humidity)
 - Intermittent computing
 - RF sensors
- Sustainable cloud/mec computing
 - Architectures to compute on renewable energy sources
 - Energy/computing capabilities orchestration
 - Cryptocurrency computing models

Areas of expertise and services

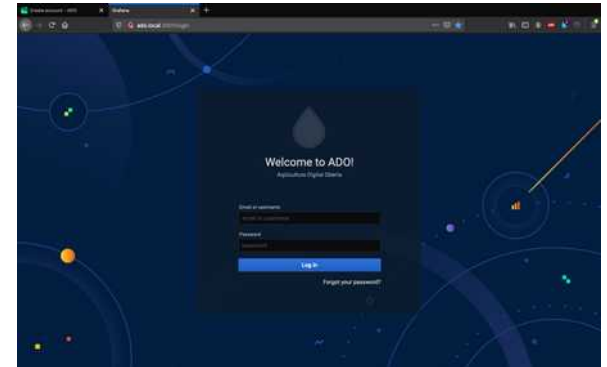
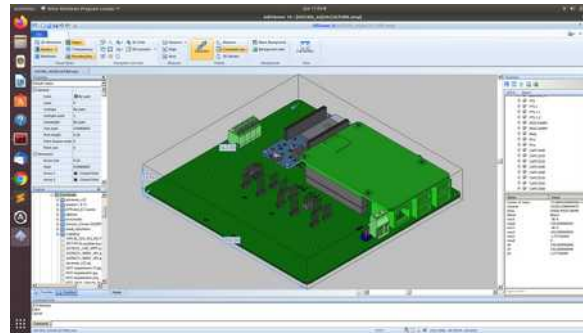
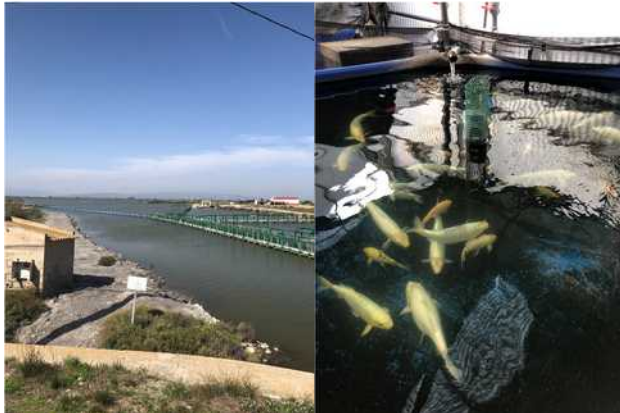
- Industrial Wireless
 - IETF 6TiSCH
 - WiFi 7 (802.11be)
 - LPWAN (LoRaWAN, LoRa-E (LR-FHSS), NB-IoT, etc..)
- Energy Efficient computing
 - Cloud computing energy consumption modeling
 - Renewable energy sources modeling
- Indoor localization
 - BLE localization with AoA
- Passive sensing and computation
 - passive industrial sensors
 - RFID
- Engineering and knowledge transfer in the IoT and CPS fields
 - HW, FW and SW development
 - Consulting

Some research outcomes



Productive sector digitization

- European Maritime and Fisheries Fund grant
- Develop the concept of Open Digital Aquaculture
- Development of an open source datalogger
- Development of an open data management site
- 3 pilots starting on Jan 2021



Relevant Information

- Standards: RFC8180, RFC8480, RFC8578
- Patents: 30 patents in the last 4 years
 - e.g. Xavier Vilajosana, Borja Martinez, Ferran Adelantado, Pere Tuset. "DRIFT CORRECTION IN A WIRELESS NETWORK". PCT/EP2016/067541. EPO. 22 July 2017.
- Open Hardware and Software
 - I3Mote (<http://www.ti.com/lit/ug/tidud23a/tidud23a.pdf>)
 - OpenMote (<http://www.openmote.com/>)
 - ADO platform
 - Co-maintainers of OpenWSN.org
 - Online testing tool for LoRaWAN (F-Interop)

Relevant information

- Involved in numerous research projects and industrial grants
 - Digital Future Society Award
 - Awarded CISCO Gift
 - H2020 ORCA OpenCALL
 - H2020 F-Interop OpenCALL
 - Hold 2 ITN networks (Crossfire and Spotlight)
- Lab equipped
 - SDRs/USRP
 - IoT devices, tools and sensors
 - Hardware design and prototyping tools
 - Cloud/HPC facilities

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Uoc

Thanks!

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