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ENSSAT

LANNION

NUMÉRIQUE
& PHOTONIQUE



ENSSAT Summer School:

Connecting your IoT Devices

June 27th – July 10th 2021

Olivier Berder, Professor, Rennes 1 University

Nathalie Caradec, French Language Teacher

Matthieu Gautier, Associate Professor, Rennes1 University

Claire Le Page, Director of International Relations at Enssat

Aurélien Moreau, Research Engineer



Connecting your IoT Devices



Dates

June 27th - July 10th 2021



Organizing unit

*ENSSAT / Rennes 1 university
Eco-counter (corporate partner)*



Target group

• Only for advanced Bachelor and Master students, in the field of Digital Sciences and Technology (Electronics, Computer Science...).
• Skills in C language and signal processing basics will be welcome.



Credits

4 ECTS credits



Course fee

*• Free: tuitions fees, social events, material.
• An EDUC grant (1050 €) will help you cover accommodation, food and transport costs.*



Language of instruction

English



Course Location

***Lannion** (Brittany), France*

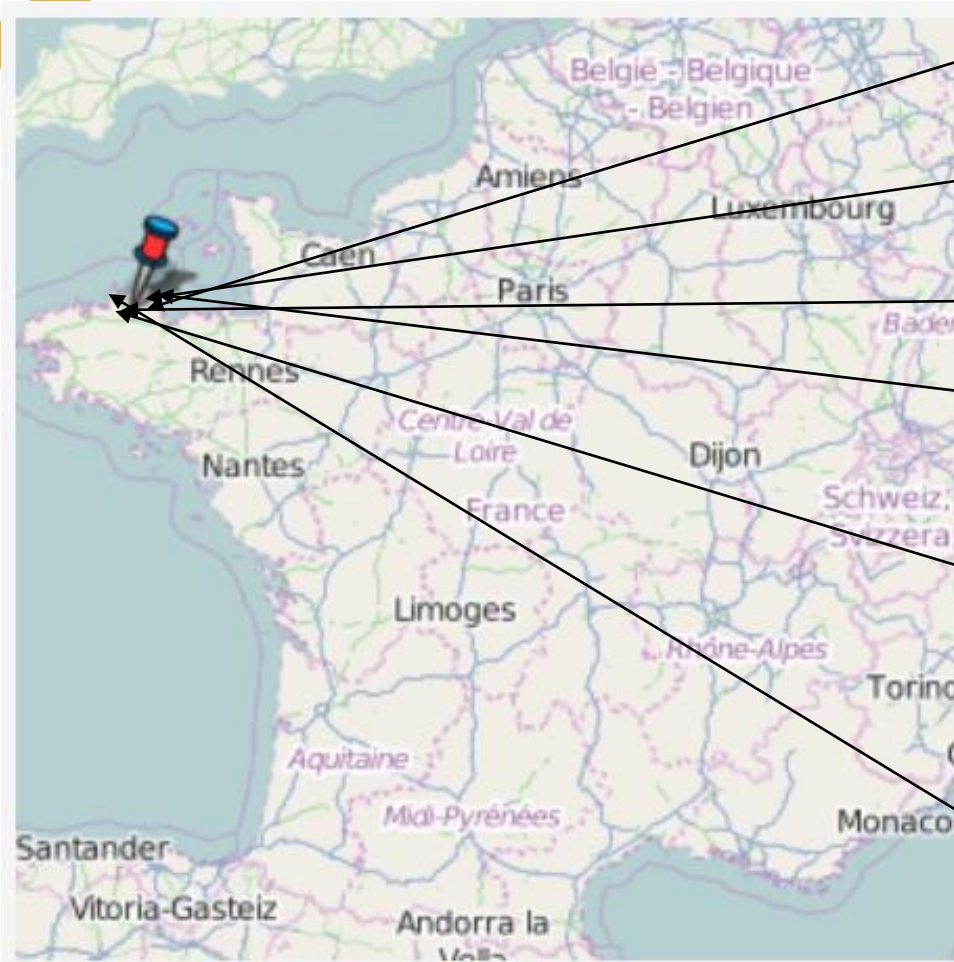


European
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Where is LANNION ?



POTSDAM 1.483kms

BRNO 1.739 kms

PECS 2.060kms

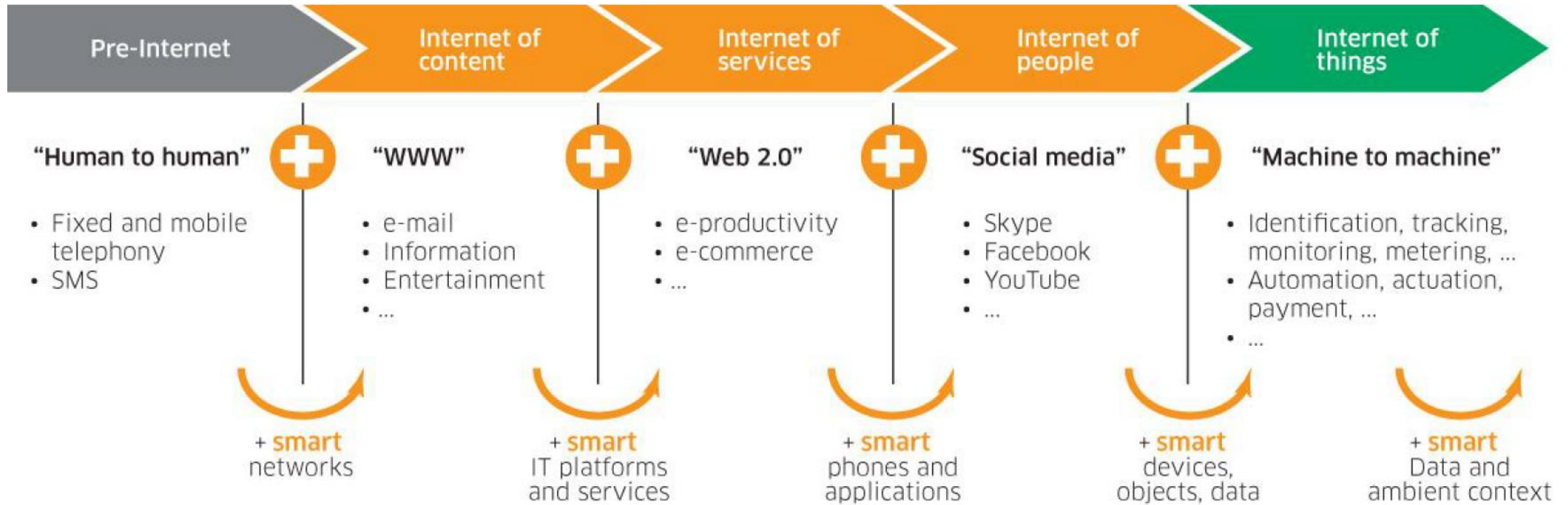
CAGLIARI 1.856 kms

NANTERRE 522 kms

RENNES 165 kms



Internet of Things (IoT)



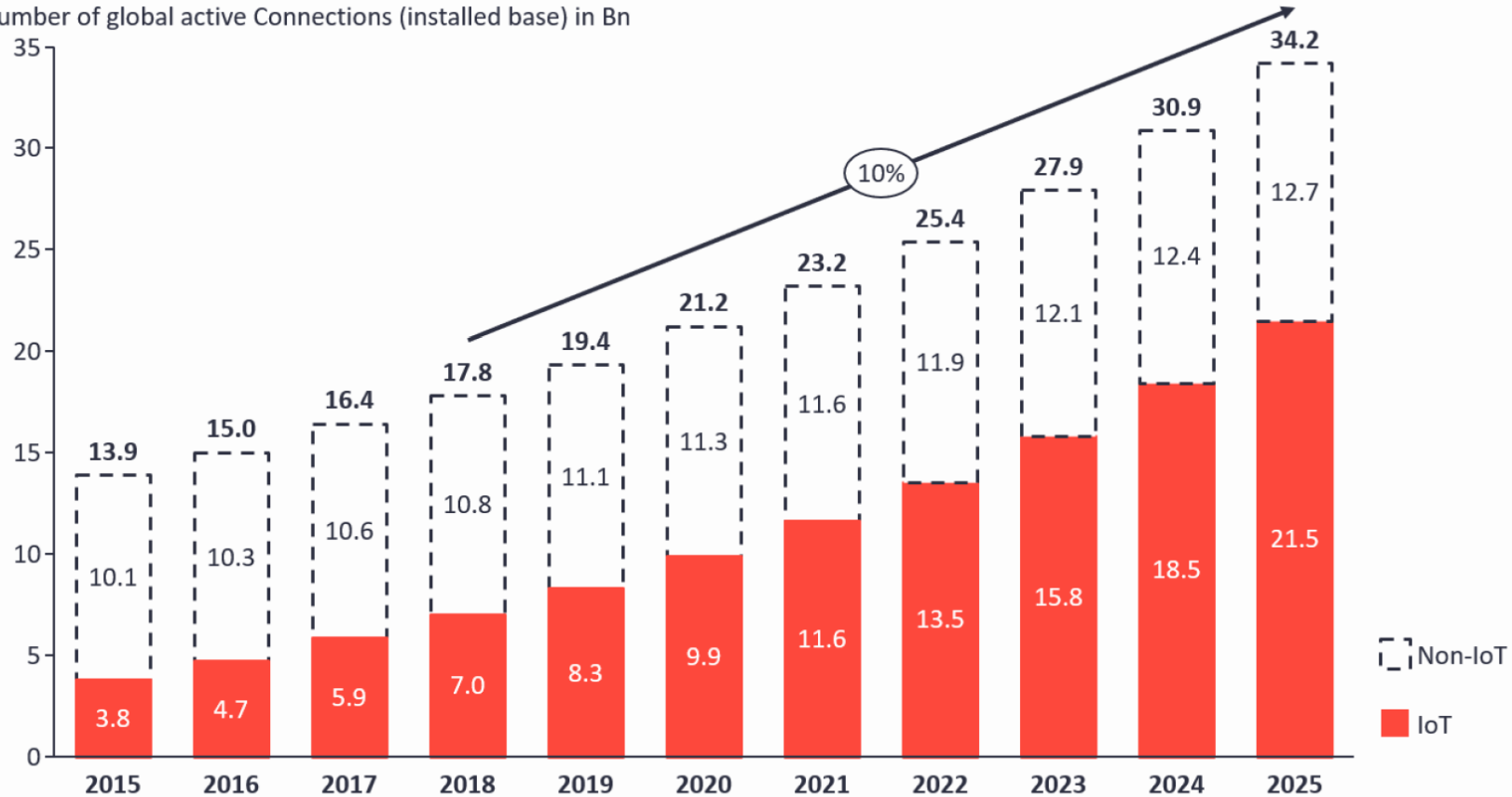
Internet of Things (IoT)

IOT ANALYTICS

Insights that empower you to understand IoT markets

Total number of active device connections worldwide

Number of global active Connections (installed base) in Bn



Note: Non-IoT includes all mobile phones, tablets, PCs, laptops, and fixed line phones. IoT includes all consumer and B2B devices connected – see IoT break-down for further details
Source: IoT Analytics Research 2018



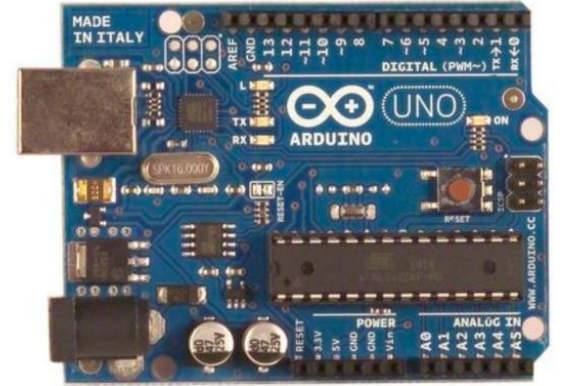
Connecting your IoT Devices

Course leaders: Prof. Olivier Berder & Dr. Matthieu Gautier

Course topics: students will discover...

- Theoretical and practical lessons about recent advances in enabling technologies for smart devices
- The various aspects of a smart device: from the sensors themselves to the data processing and transmission
- Classical IoT standards (BLE, ZigBee...).
- Long range communications (LoRa, Sigfox, NB-IoT...)

Connecting your IoT Devices



Practical lessons: team project

- Develop a prototype for innovative IoT applications
- Full development cycle: from specifications to a demonstration
- Course material provided: various sensors and wireless transceivers plugged to Arduino motherboards
- General goal: solve a societal challenge to measure human activities with the best energy efficiency and reasonable resource use

Connecting your IoT Devices

At the end of the IoT course, students should be able to:

- Know the architecture of a sensor node
- Know the main characteristics of the physical layer
- Understand the operation of the different access protocols (MAC) for IoT devices
- Understand how the network layer works for IoT devices
- Know the main communications standards for IoT devices and their characteristics (range, speed, consumption)
- Design a sensor network platform incorporating several wireless nodes to meet an application specification
- Experimentally implement this platform

Eco-counter



- **Has 20 years of experience** creating solutions to analyze the flows of pedestrian and bikes around the world
- **Offers end-to-end solutions** to easily analyze their data and make decisions based on the ground truth
- **Is present in 48 countries** around the world
- Challenge name: **Smart Cities Data**



- **Three steps for the societal challenge with open innovation:**
 - First, to measure human activities (noise, metering, resource use) with the best energy efficiency and reasonable resource use
 - Secondly, to transmit its data automatically, with the objective of saving carbon by avoiding human movement.
 - Finally, to produce from the data a relevant analysis, allowing city managers to take decisions improving life, the use of space in connection with the environmental challenges of our century.

French Lesson courses

Some lessons will be organized to give the students some introductory basis to the **French language** and some cultural insights about the **Breton culture**.

Course leader: Dr. Nathalie Caradec, French language teacher



Intercultural communication
















We will offer the students a course on **intercultural awareness** and communication skills in participating in active workshops.









Course leader : Claire Le Page

Guest speaker: Professor Zdeněk Janík from Mazaryk university

The programme: week n°1

Sunday June 27th	Monday June 28th	Tuesday June 29th	Wednesday June 30th	Thursday July 1st	Friday July 2 nd	Saturday July 3rd
Arrival	9.00-10.00 Opening ceremony Enssat presentation	9.00-10.00  FLE/ Intercultural communication	9.00-10.00  FLE Intercultural communication	9.00-10.00  FLE Intercultural communication	9.00-10.00  FLE Intercultural communication	9.00-12.00 KAYAK ACTIVITY 
	10.15 – 12.15 Workshop on intercultural communication (Self - assessment)	10.30-12.30 LESSON 	10.30-12.30 LESSON 	10.30-12.30 WORKSHOP 	10.30-12.30 LESSON 	
	12.30- 13.30 : LUNCH					PICNIC
	13.30 -14.30 Opening Lecture ECO COMPTEUR	13.30 -15.30 WORKSHOP 	13.30-15.30 WORKSHOP 	13.30- 15.30 WORKSHOP 	13.30-15.30 WORKSHOP 	14.00- 18.00 VISIT TELECOMMUNICATION MUSEUM
	14.30- 15.30 Project : presentation					
	16.00-18.30 Rallye : Discovering Lannion	16.00-18.30. STUDY GROUPS	16.00- 18.30 VISIT ECO- COMPTEUR	16.00-18.30 STUDY GROUPS	16.00-18.30 STUDY GROUPS	
					18.30-22.30 CULTURAL ACTIVITIES BRETON PARTY	
19.00 – 22.00 WELCOME DINNER						

The programme: week n°2

Sunday July 4th	Monday July 5th	Tuesday July 6th	Wednesday July 7th	Thursday July 8th	Friday July 9th	Saturday July 10th
9.00-12.00 Cultural discovery In autonomy	9.00 -10.00 FLE  Intercultural communication	9.00-10.00 FLE  Intercultural communication	9.00-10.00 FLE  Intercultural communication	9.00-10.00 FLE  Intercultural communication	9.00-12.30 STUDY GROUPS Presentation preparation	DEPARTURE
	10.30-12.30 LESSON 	10.30-12.30 LESSON (Projet flipped class) 	10.30-12.30 FLIPPED CLASS 	10.30-12.30 FLIPPED CLASS PRESENTATION		
12.30- 13.30 : LUNCH						
14.00- 19.00 VISIT	13.30 -15.30 WORKSHOP	13.30 -15.30 WORKSHOP	13.30-15.30 WORKSHOP	13.30- 15.30 WORKSHOP	13.30-16.30 GROUP PRESENTATION	
	16.00-18.30 VISIT ORANGE	16.00-18.30 STUDY GROUPS	16.00-18.30 GOLF ACTIVITY 	16.00-18.30 STUDY GROUPS		
CRUISE : SEVEN ISLANDS	FREE TIME	FREE TIME	FREE TIME	FREE TIME	17.00-18.30 CLOSING SESSION / CERTIFICATE HANDOUT	

Social programme



- Welcome party
- Rallye: discovering Lannion.
- Breton party : dancing and tasting local food
- Visits:
 - telecommunications museum
- Cruise : seven islands and bird sanctuary
- Farewell party
- Sports : kayaking and Golf

Accommodation and food

Students will be hosted in the University of technology dormitory not far from the school. Meals will be provided at the cafeterias (breakfast/lunch/dinner) and special conditions are provided because of the sanitary conditions.



Budget

- Accommodation: \approx 300 €
- Food (breakfast, lunch, dinner): \approx 500 €
- Transport inside Lannion: \approx 20 €
- These expenses can be reimbursed by the EDUC Grant (up to 1050 €)





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