UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

MASTEAM

Master's degree in Applied Telecommunications and Engineering Management

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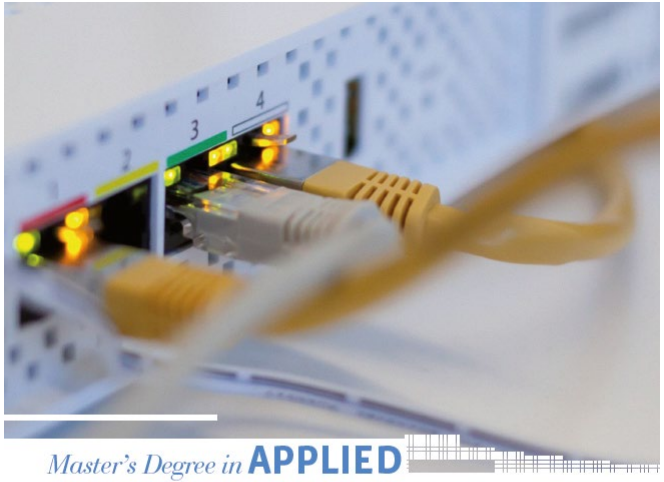
Índex

MASTEAM

What is our academic offer?



Master's Degree in **APPLIED TELECOMMUNICATIONS AND ENGINEERING MANAGEMENT (MASTEAM)**

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Fostering innovation and entrepreneurship on Information and Communications Technologies

Motivation

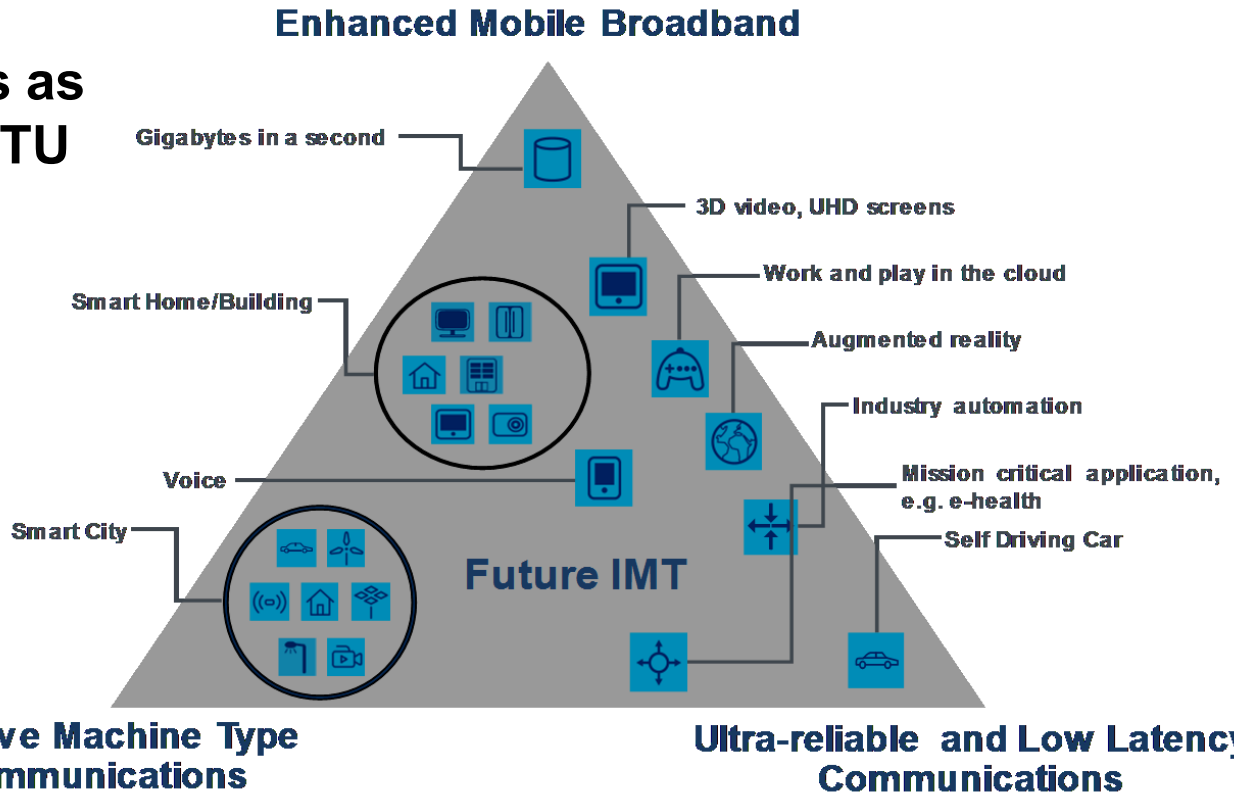
Our goal

Training professionals to acquire the skills that enable them to

- conceive, design and implement cutting-edge engineering solutions,
- manage complex multidisciplinary projects, and
- improve people's welfare in a sustainable economy
- Our focus: 5G an the Internet of Things (IoT)

Challenges: 5G

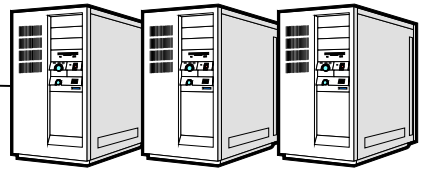
5G Scenarios as foreseen by ITU



Challenges: IoT

Optical networks,
IP protocols, SDN

IP networks



Data centers,
networks, protocols,
SDN, NFV, Big Data

IoT gateway

Radiocomms,
protocols, SDR

Business models,
service
management

Sensors

Electronics,
low-power

Main topics: 5G networks & Internet of Things

Generic courses on:

- Sensors (data source)
- Wireless and optical technologies for data communication
- Advanced data-processing methods
- Design optimization algorithms
- Translation of ideas into new devices and services

Specific courses on cutting-edge applications:

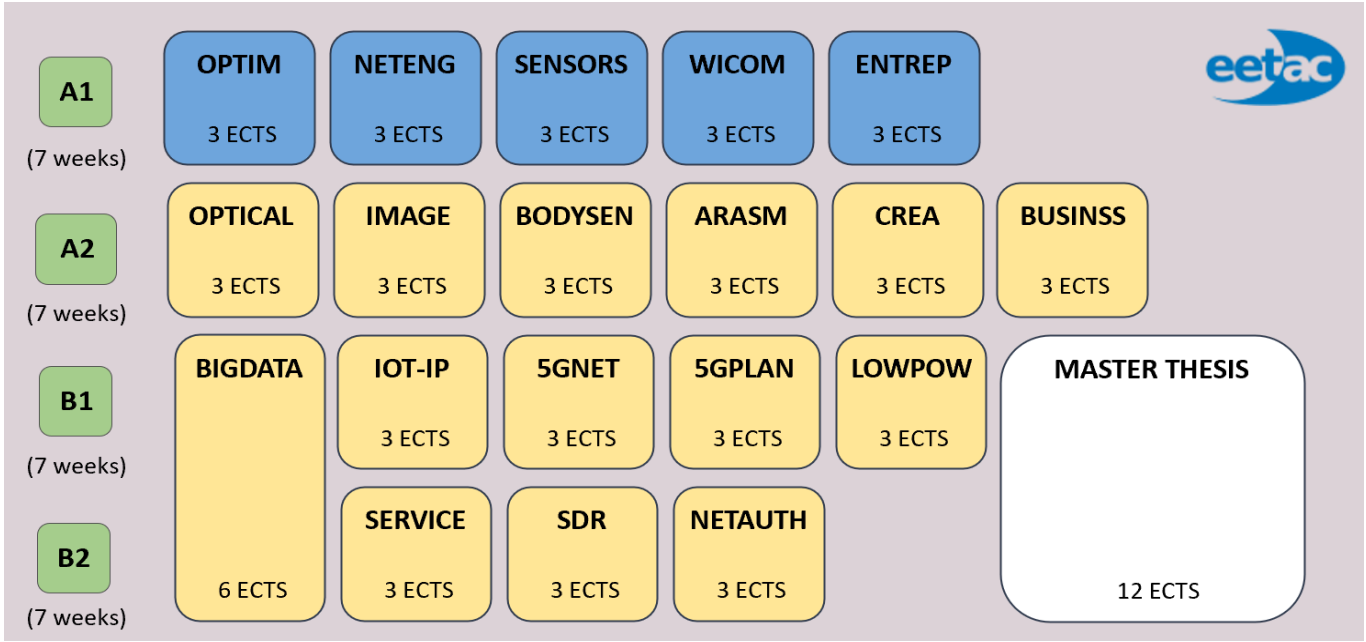
- Internet of Things
- Smart Objects
- Body Area Networks
- Image Processing
- Network Security
- Service engineering

Programme structure (1)

60 ECTS: **1 year** for a full-time student

Fall semester
30 ECTS

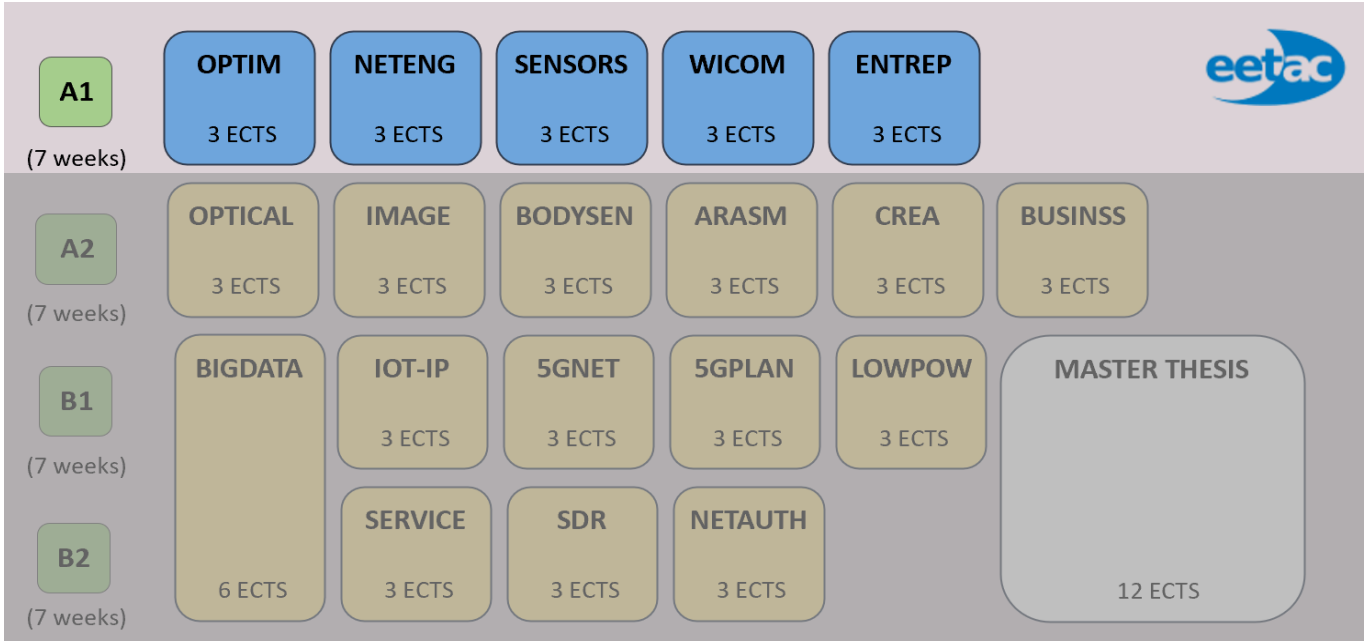
Spring semester
30 ECTS



Programme structure (2)

4 half-semesters (six-week courses + 1 exams week)

Mandatory courses: 15 ECTS

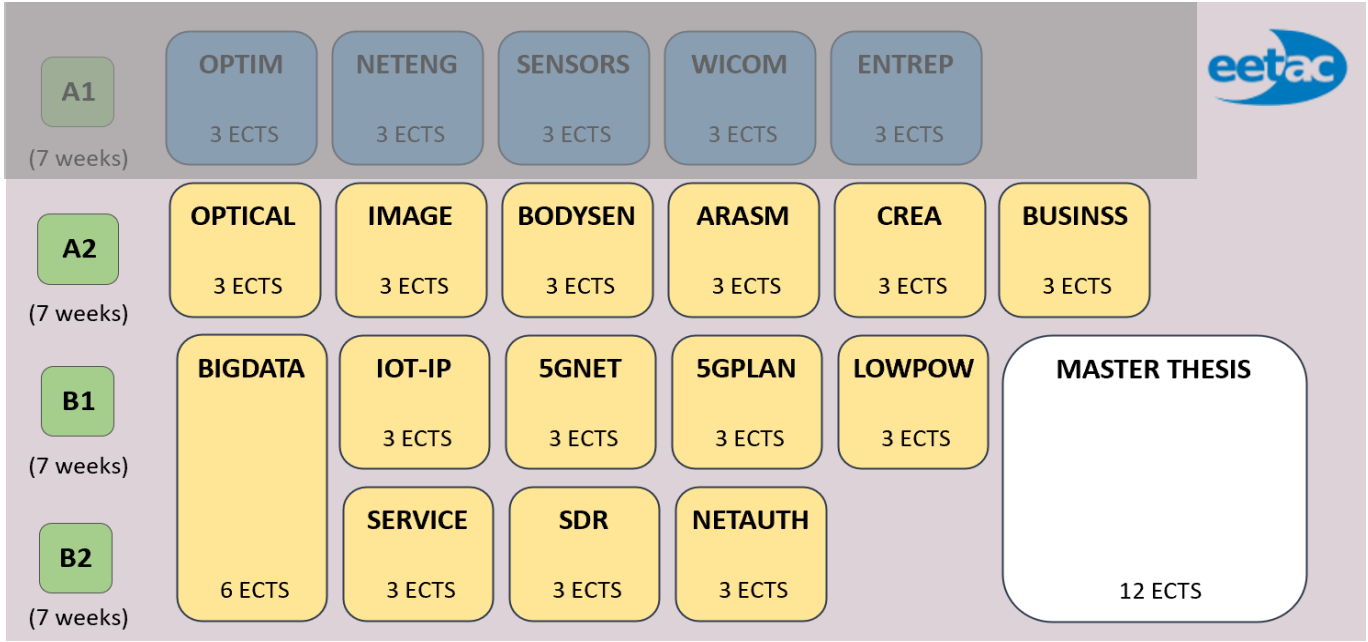


Programme structure (3)

4 half-semesters (six-week courses + 1 exams week)

Elective courses: 33 ECTS

Master Thesis: 12 ECTS



Changes in this structure

Mandatory courses

- Contents remain the same, changes might be introduced in their sequence!

Elective courses:

- Some of the currently offered courses will have an elective extension
- Changes in their sequence might also be introduced

Dedication

Full-time students:

- 1 academic year (studies starting in September)
- 1.5 years if studies begin in February

Part-time students usually spend 2 years

Non-EU students: Spanish authorities expect you to have full-time dedication!

Work load:

- **1500 hours**
- At UPC masters, **1 ECTS = 25h** of student activities = **9h** at classroom + **16h** of autonomous learning

Course sequence constraints

Some of the mandatory courses are **pre-requisite** before taking some elective courses (hard constraint), or **recommended** (soft constraint)

- WICOM is **pre-requisite** of 5GNET, 5GPLAN, and SDR
- ENTREP is **pre-requisite** of BUSINESS (but both courses can be enrolled in the same semester and be taken consecutively)
- WICOM is recommended before IOT-IP
- SENSORS is recommended before BODYSEN

Calendar constraints:

- A1 and A2 courses are offered only in Fall semester
- B1 and B2 courses are offered only in Spring semester
- There are some current exceptions to this, likely to become obsolete soon

Double degree agreements

We have some agreements to pursue a double degree from UPC and one partner:

- Aalto University (Finland). Master's Programme in Computer, Communication and Information Sciences - Communications Engineering tracks
- Università dell'Aquila (UNIVAQ) (Italy). Master in Telecommunications Engineering
- In negotiation: Politecnico di Torino (Italy) and Técnico Lisboa (Portugal)
- More may materialize during the next course!

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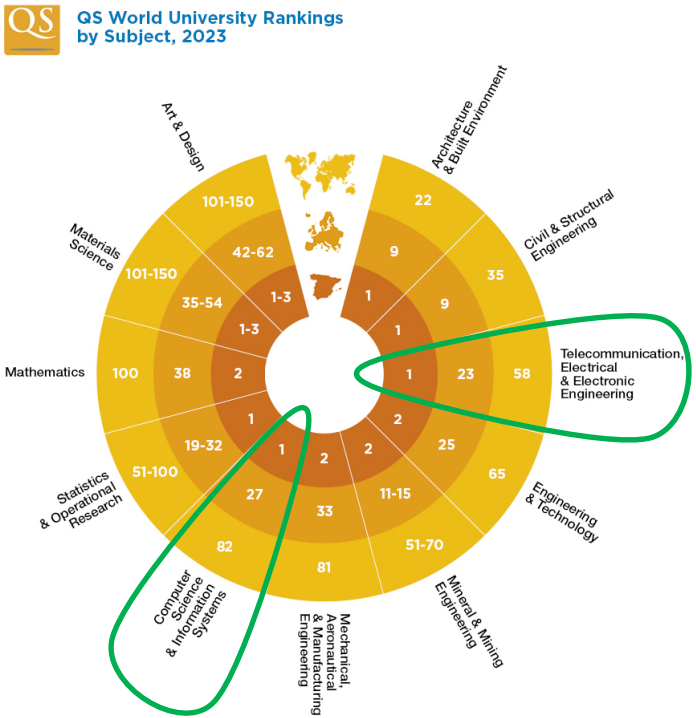
Why study here?

EETAC Building (Castelldefels)

Some facts and figures (1)



Telecommunications, Electrical & Electronic Engineering:
1st in Spain, among the top 60 in the world

Computer Science & Information Systems:
1st in Spain, among the top 90 in the world

(Source: QS World University Rankings, 2023)

Some facts and figures (2)

UPC & 5G

Top Spanish university as recipient of funding from EU Horizon 2020 research projects, and among the first positions at the European level

5G Barcelona

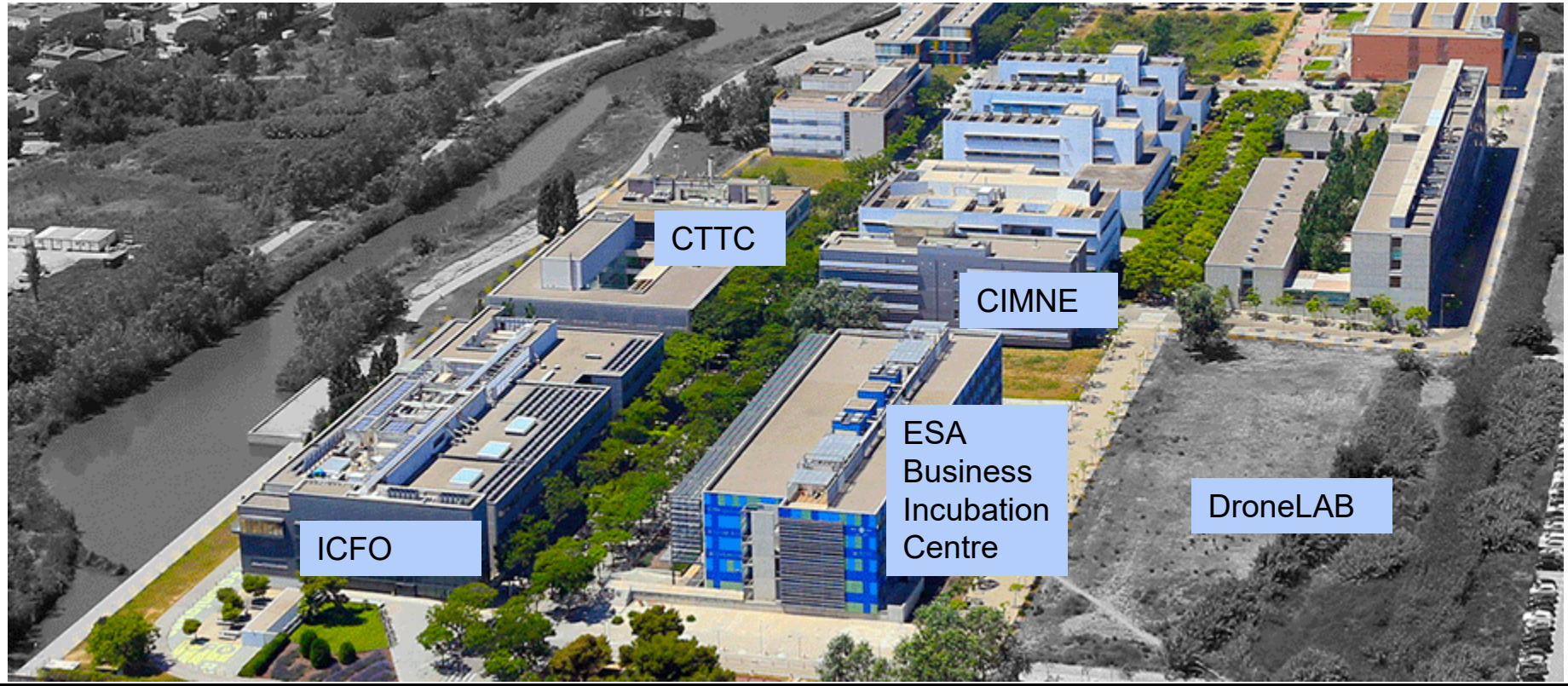
Local and EU H2020 research project – many MASTEAM professors involved
i2Cat, **UPC**, **CTTC**, Atos, Telefonica, MWCapital, local & regional government, among other partners
Presence of local partners in 22 out of the 37 5G-related H2020 EU projects

https://5gbarcelona.org/en-labs/

Our Campus


Agriculture School
EETAC
Student's residence
Library/Cafeteria/ Administration

Parc Mediterrani de la Tecnologia



Campus Departments & Faculty

DEPARTMENT			DEPARTMENT	
Computer Architecture	**20**			
Electronics Engineering	**12**		Physics and Nuclear Engineering	1
Network Engineering (Telematics)	**20**		Institute of Energy Technology	2
Management and Business Organization	**15**		Applied Mathematics I	1
Signal Theory and Communications	**35**		Applied Mathematics III	1
Construction Engineering	1		Applied Mathematics IV	15
Applied Physics and Aeronautics Engineering	34		Graphical Expression in Engineering	11
Materials and Structure Engineering	2		Agri-Food Engineering and Biotechnology	2
Geotechnical Engineering and Geo-Sciences	4		Control theory and industrial computers	1
TOTAL			**165**	

Research groups (MASTEAM Faculty)

1. Advanced Materials and Technologies for Communications
2. Audio-visual Systems
3. Broadband Networks and Services
4. Control, Monitoring and Communications
5. Distributed Systems Architectures
6. Instrumentation, Sensors and Interfaces
7. Intelligent Communications and Avionics for Robust Unmanned aerial Systems
8. Mobile and Radio Communications
9. Optical Communications
10. Wireless Networks

Research activities

11 projects granted by the European Comission + **14 projects** granted by the Spanish Administration on:

- 5G/6G, communication infrastructures, IoT & autonomous sensors, artificial intelligence, aerospace, cybersecurity, business innovation & talent management

Our faculty also participates in

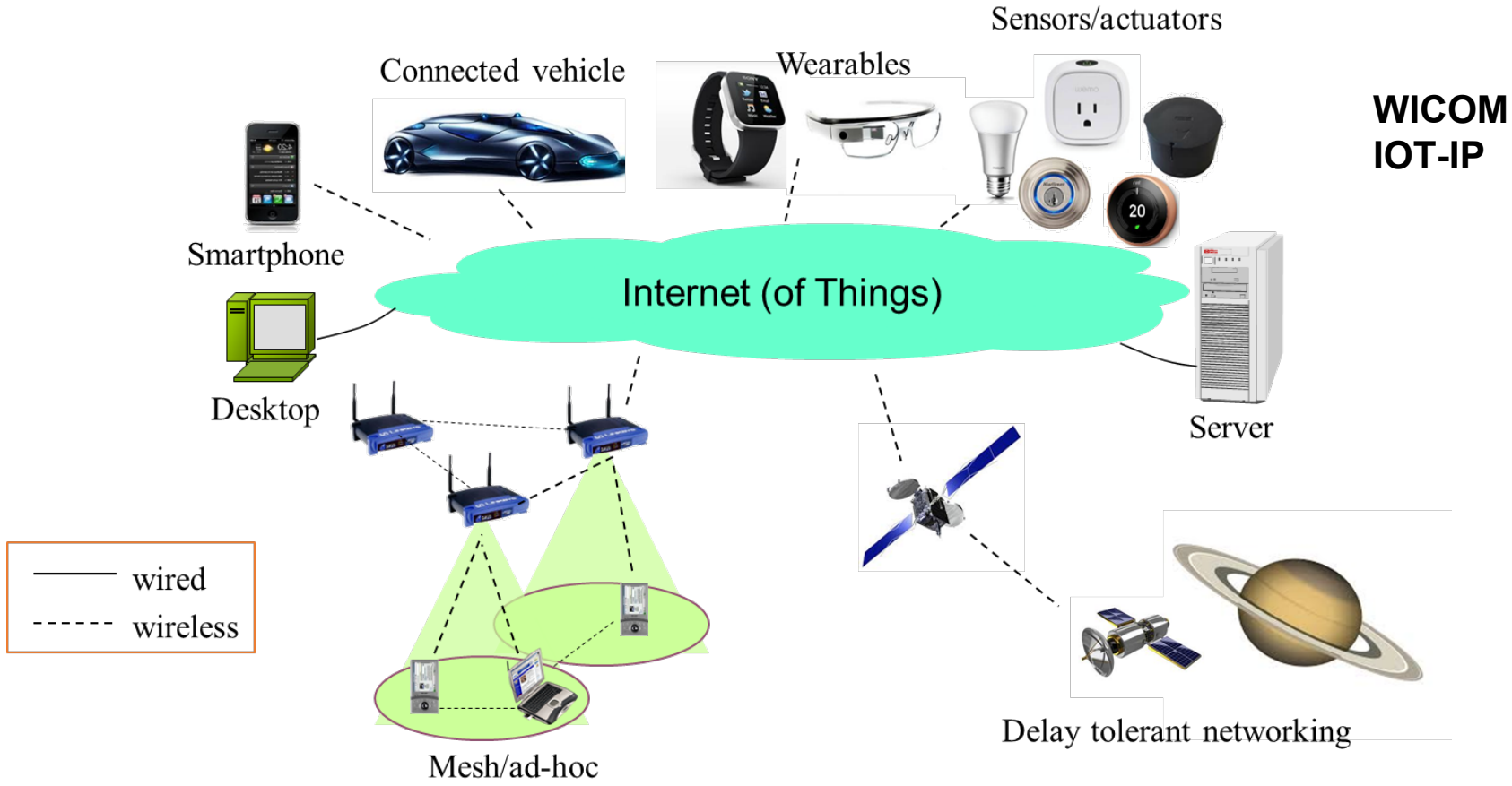
- Editorial boards of high-impact scientific journals
- Committees devoted to the definition of communication protocols

Research activities: Examples (1)

- Flying Internet of EveRything Communication Enhancements (FIERCE)
- Laboratorio Abierto Científico-Tecnológico de Investigación en 6G de la UPC" (6G-OpenLab).
- Evolution of infrastructure (ultra low Latency) and Expanded mobile system (mmWave) towards 6G-AI NeTworks (ELEGANT)

WICOM / 5GPLAN

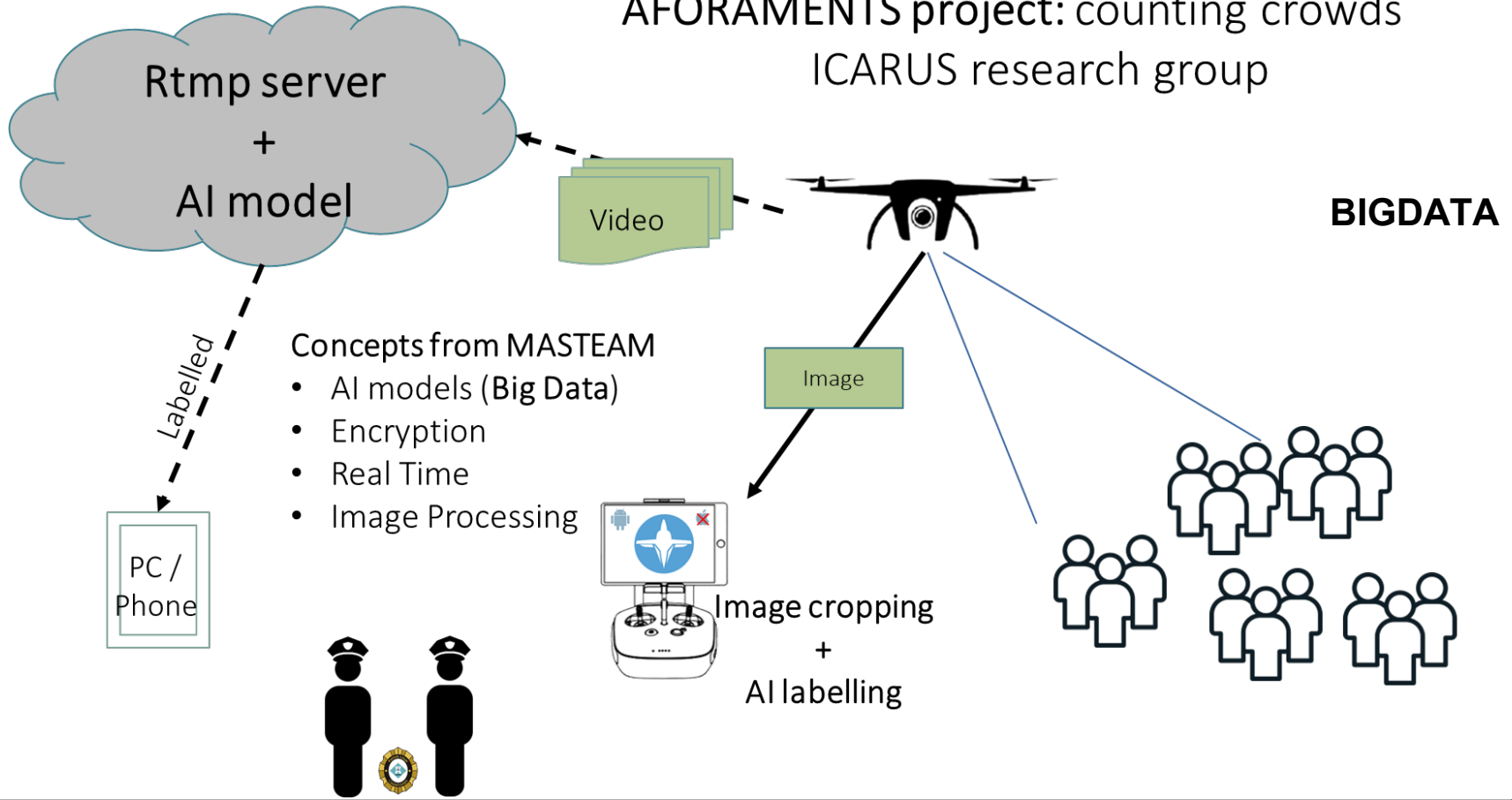
Research activities: Examples (2)



WICOM
IOT-IP

Research activities: Examples (3)

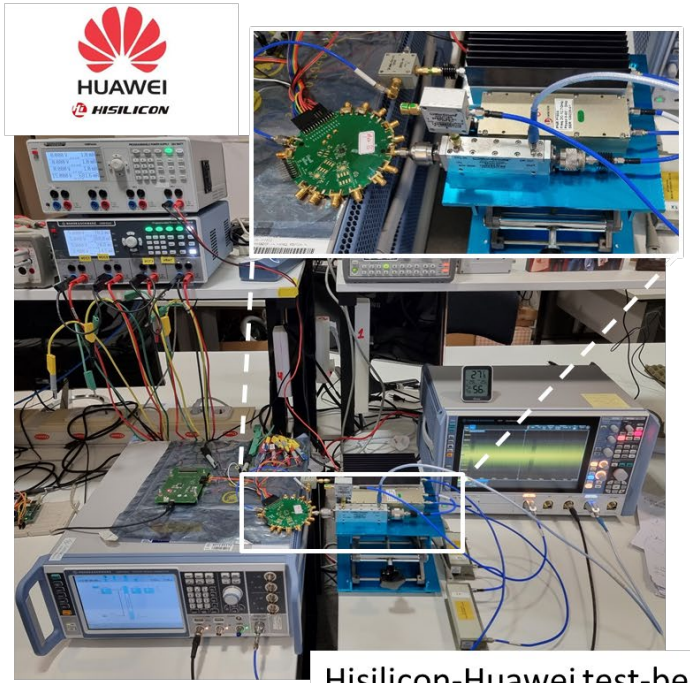
AFORAMENTS project: counting crowds
ICARUS research group



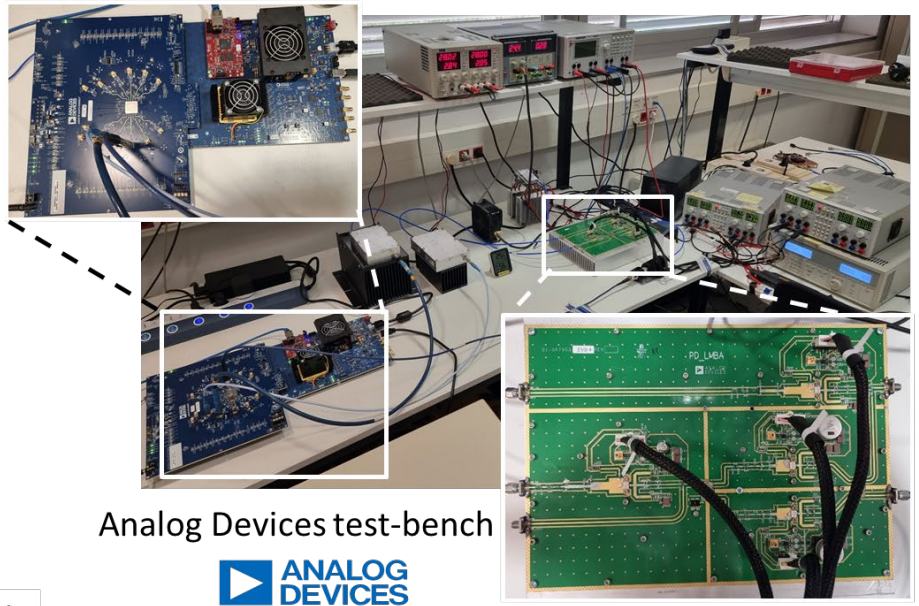
Research activities: Examples (4)

Software Defined Radio (SDR):

Characterization and modeling of nonlinear systems. Digital predistortion (DPD) linearization of highly efficient power amplifiers.



Hisilicon-Huawei test-bench

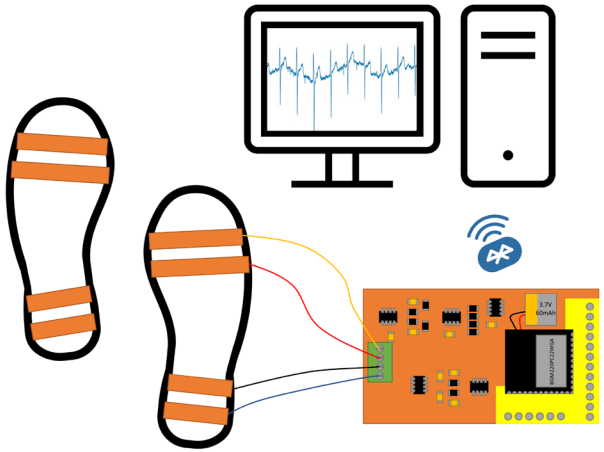


Analog Devices test-bench

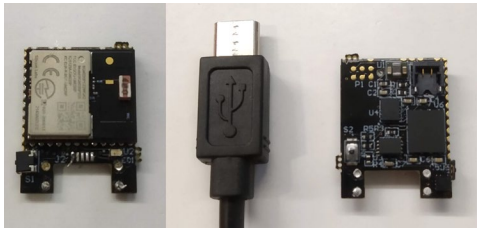
DPD linearization of power amplifiers for mobile terminals with non-flat frequency response and considering dynamic resource block allocation.

Artificial Intelligence and machine learning solutions to linearize dual-input, high-efficiency load-modulated balanced amplifiers for base stations.

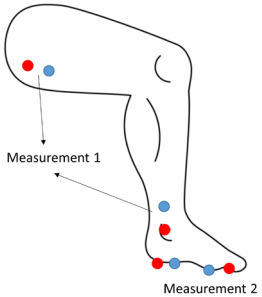
Research activities: Examples (5)

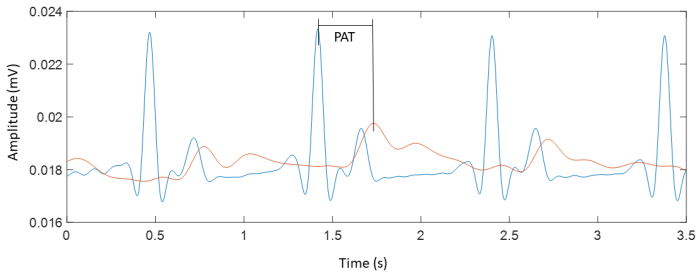


Project: Deepening knowledge and improving the Quality of Life in Parkinson Disease through Smart Insoles (MyGait)



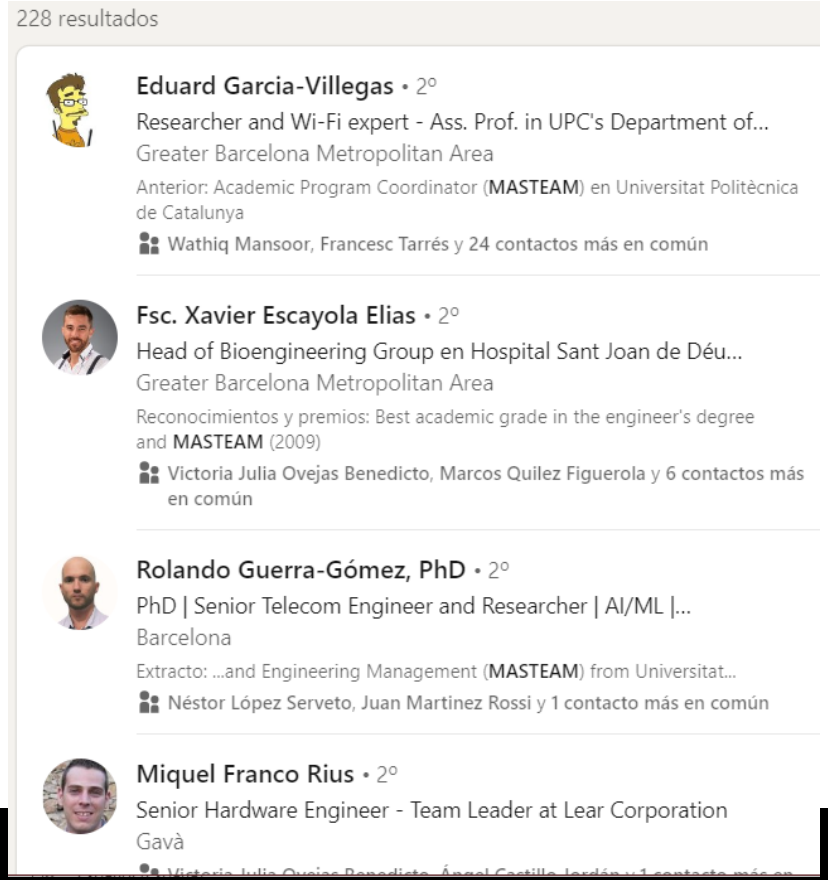
SENSORS
BODYSEN
LOWPOW





MASTEAM Alumni

- 95% of employed alumni
- 76% find a job in less than 3 months
- LinkedIn: 220+ contacts



MASTEAM

Acces & Admission process

General access requirements (1)

- An official Spanish university qualification or an official university qualification issued by a university in the **European Higher Education Area (EHEA)** that qualifies the holder for admission to a master's degree.

- A qualification issued by a university in a country that is not in the EHEA
  - If the qualification has not been homologated, the UPC will verify that the course of study corresponds to a level of education equivalent to an official Spanish university degree and that the qualification obtained **would provide admission to a master's degree** in the country in which it was awarded
  - This access route in **no way implies the homologation** of the qualification or its recognition for any purpose other than admission to the master's degree. The master's degree will, however, be fully and legally valid

General access requirements (2)

- Master's are also open to UPC bachelor's degree students who have **not awarded** the bachelor's degree because
  1. they are missing up to 9 ECTS elective credits (including credits pending recognition or transfer),
  2. they are missing their Bachelor’s thesis, or
  3. they have not yet attained the cross-disciplinary competency in a foreign language, if applicable

Specific access requirements (1)

- An official Bachelor Degree OR Technical Engineering Degree in
  - Telecommunications or ICT (Information and Communication Technologies) Engineering specializing in Telecommunications Systems
  - Telematics (Computer Networks)
  - Electronic Systems
  - Audiovisual Systems
  - Science & Technologies of Telecommunications
  - …or an official MSc Degree in Telecommunications or ICT Engineering

- Any of the aforementioned degrees must have been obtained in an educational institution from a state belonging to the European Higher Education Area (EHEA)

Specific access requirements (2)

- With **complementary coursework**, other engineering degrees from EHEA or Telecommunications/ICT engineering degrees from outside EHEA might be accepted
- The Academic Committee will review the applications and may propose the appropriate compulsory bridge courses (you should pass them in order to continue your master's studies)
- Language requirements: English language certification – Level B2 or higher, according to the Common European Framework of Reference for Languages (CEFR)

Documentation

- **Passport**
- **Bachelor degree** and academic record/transcript of records
- Curriculum vitae, **motivation letter** and **two letters** of recommendation (from a professor and/or former employer)
- If your Bachelor degree was not obtained in Spain, your should add a **declaration of equivalence** or your degree marks in the Spanish mark scale.
- Certification of English Language: B2 (or higher) of the Common European Framework of Reference for Languages, or an equivalent level in other scales (IELTS, TOEFL, Cambridge, etc).
- If your have any other master or bachelor degree, even if not finished, add your transcript of records and/or degree certificate.

Calendar

- Candidates wishing to start their studies in September 2024 (Autumn 2024 semester) should apply during the pre-enrolment period open from **January 2024 to July 1st 2024**
- Non-European Union nationals should apply as soon as possible, in order to obtain admission soon enough to proceed with the visa request at the Spanish consulates in their countries
  - Note that **we do not have any kind of influence on those consulates**, and cannot speed up the visa application!
- Up to 35 candidates can be admitted each year (25 on the Autumn intake, 10 on the Spring intake)
- Visit https://www.upc.edu/en/masters/access-admission-enrolment for more details!

Admission

- The MASTEAM Academic Committee will assess your documentation and will decide on the admission of each candidate
- You may accept or not the admission proposal
- If your visa application is still in process at the beginning of the semester, you will be offered the option to defer the start of your studies for the next semester (fees apply)

Further information

- Visit https://eetac.upc.edu/en/study/masters-degrees/masteam for
  - ✓ Course descriptions
  - ✓ Fees
  - ✓ Double degree agreements
  - ✓ Specific information for international students

Thank you for your assistance!

Questions?