MASTEAM

Master's degree in Applied Telecommunications and Engineering Management

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Academic Coordinator

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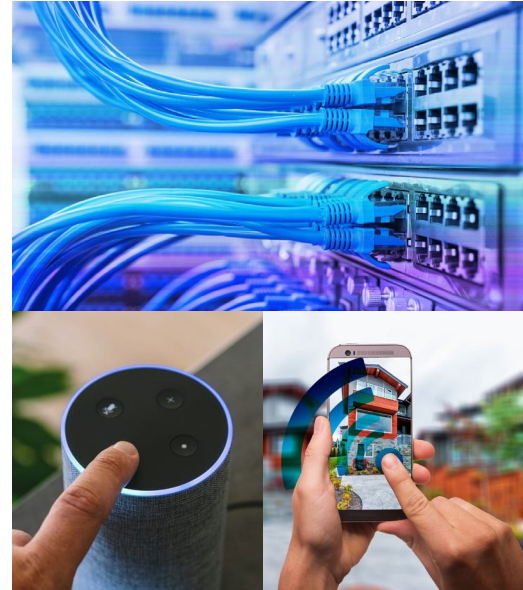
Índex

Our academic offer

Why study here?

Admission process

# MASTEAM
What is our academic offer?

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)

5G Scenarios as foreseen by ITU
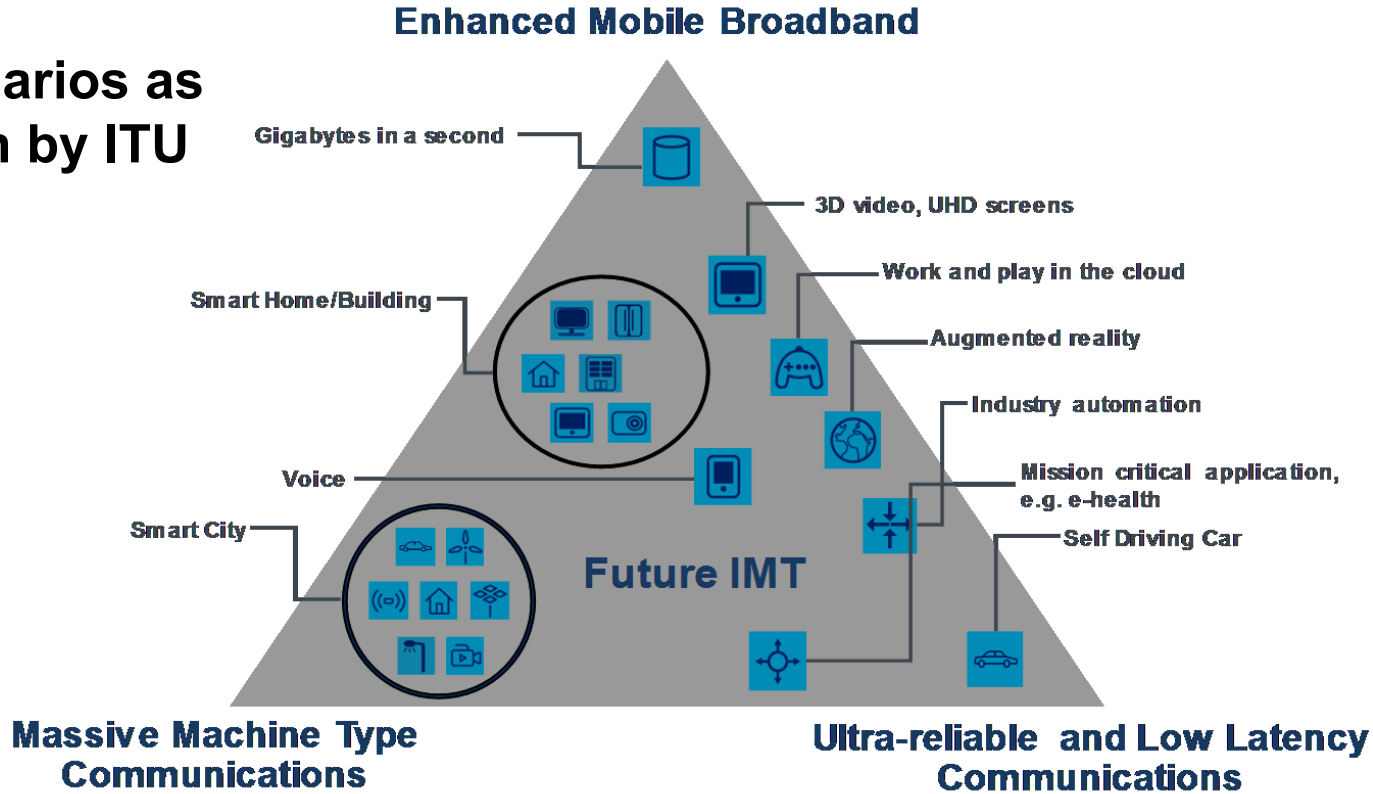
Optical networks, IP protocols, SDN
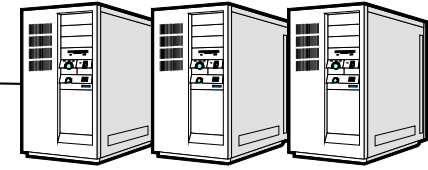
IP networks

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
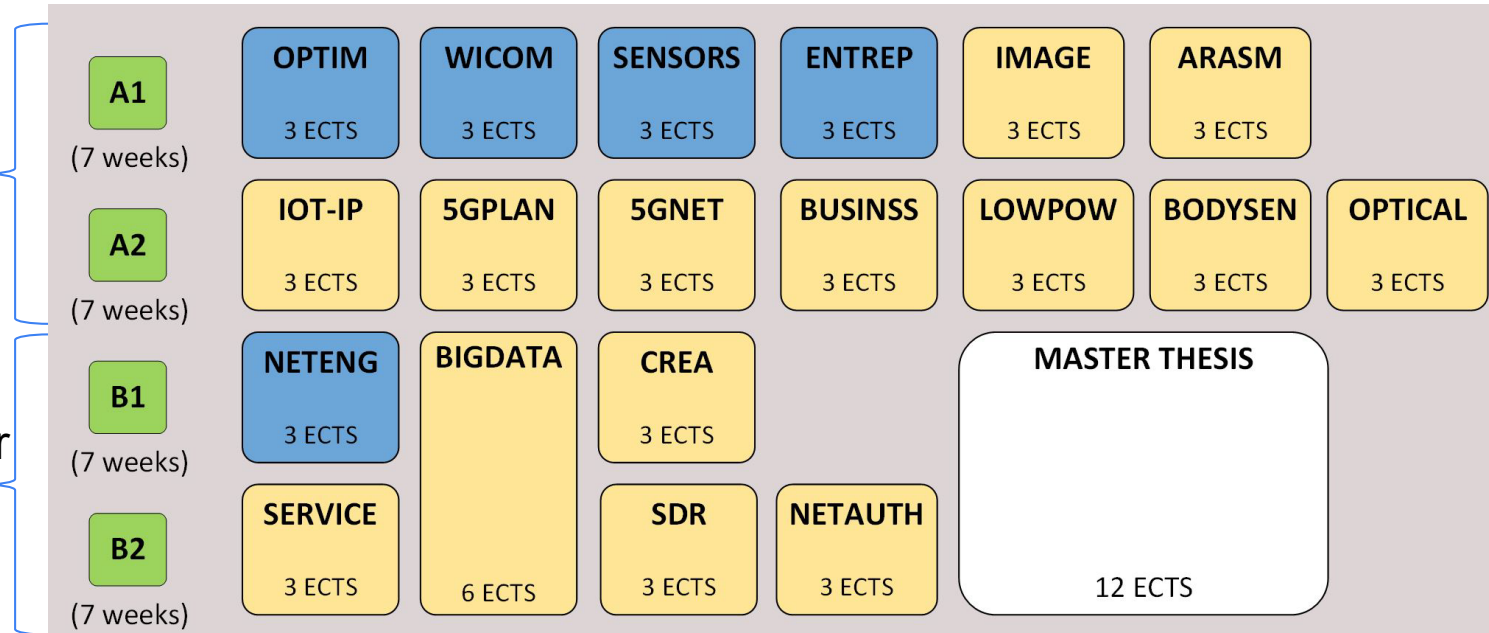- Translation of ideas into new devices and services

Specific courses on cutting-edge applications:
- Internet of Things
- Smart Objects
- Body Area Networks
- Image Processing
- Network Security
- Service engineering

Programme structure 2024-25 (1)

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

Fall semester 30 ECTS

| A1 (7 weeks) | OPTIM 3 ECTS | WICOM 3 ECTS | SENSORS 3 ECTS | ENTREP 3 ECTS | IMAGE 3 ECTS | ARASM 3 ECTS | |
| A2 (7 weeks) | IOT-IP 3 ECTS | 5GPLAN 3 ECTS | 5GNET 3 ECTS | BUSINSS 3 ECTS | LOWPOW 3 ECTS | BODYSEN 3 ECTS | OPTICAL 3 ECTS |

Spring semester 30 ECTS

| B1 (7 weeks) | NETENG 3 ECTS | BIGDATA 6 ECTS | CREA 3 ECTS | MASTER THESIS 12 ECTS |
| B2 (7 weeks) | SERVICE 3 ECTS | | SDR 3 ECTS · NETAUTH 3 ECTS | |

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

Mandatory courses: 15 ECTS

A1 (7 weeks)	**OPTIM** 3 ECTS	**WICOM** 3 ECTS	**SENSORS** 3 ECTS	**ENTREP** 3 ECTS	**IMAGE** 3 ECTS	**ARASM** 3 ECTS
A2 (7 weeks)	**IOT-IP** 3 ECTS	**5GPLAN** 3 ECTS	**5GNET** 3 ECTS	**BUSINSS** 3 ECTS	**LOWPOW** 3 ECTS	**BODYSEN** 3 ECTS	**OPTICAL** 3 ECTS
B1 (7 weeks)	**NETENG** 3 ECTS	**BIGDATA** 6 ECTS	**CREA** 3 ECTS		**MASTER THESIS** 12 ECTS
B2 (7 weeks)	**SERVICE** 3 ECTS		**SDR** 3 ECTS	**NETAUTH** 3 ECTS	

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

Elective courses: 33 ECTS

Master Thesis: 12 ECTS

A1 (7 weeks)	OPTIM 3 ECTS	WICOM 3 ECTS	SENSORS 3 ECTS	ENTREP 3 ECTS	IMAGE 3 ECTS	ARASM 3 ECTS
A2 (7 weeks)	IOT-IP 3 ECTS	5GPLAN 3 ECTS	5GNET 3 ECTS	BUSINSS 3 ECTS	LOWPOW 3 ECTS	BODYSEN 3 ECTS	OPTICAL 3 ECTS
B1 (7 weeks)	NETENG 3 ECTS	BIGDATA 6 ECTS	CREA 3 ECTS		MASTER THESIS 12 ECTS
B2 (7 weeks)	SERVICE 3 ECTS		SDR 3 ECTS	NETAUTH 3 ECTS	
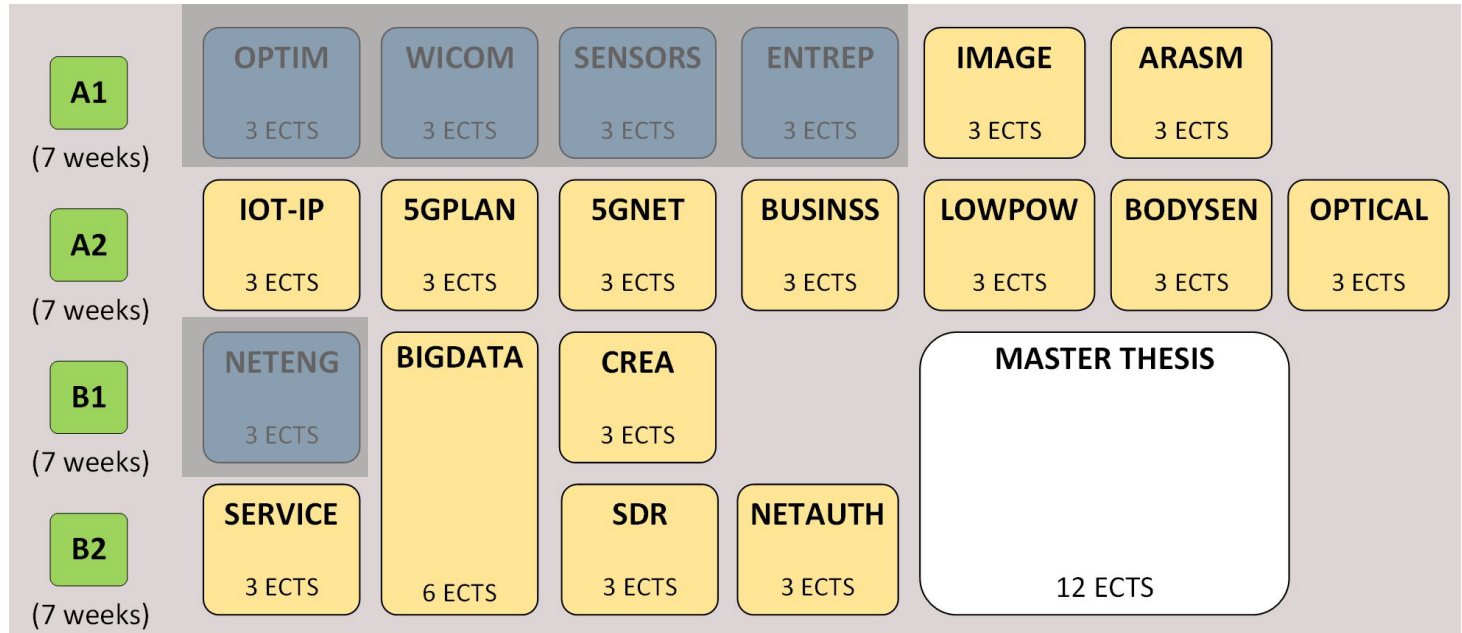
Some of the mandatory courses are **pre-requisite** before taking some elective courses (hard constraint), or **recommended** (soft constraint)

- 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

Minor changes ahead!
- Future additions to this structure
- Some changes in the scheduling should be expected

Course hours :
- Lectures: biweekly 2h to 3h sessions, for most courses
- Main time slot: from 15 h to 21 h. All mandatory courses will be offered always in this time slot
- Additional time slot: from 12 h to 14 h. Only for a few elective courses (currently, only BODYSEN will be offered in this time slot)

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

<u>Non-EU students</u>: Spanish authorities expect you to have full-time dedication!

Work load:

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

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)
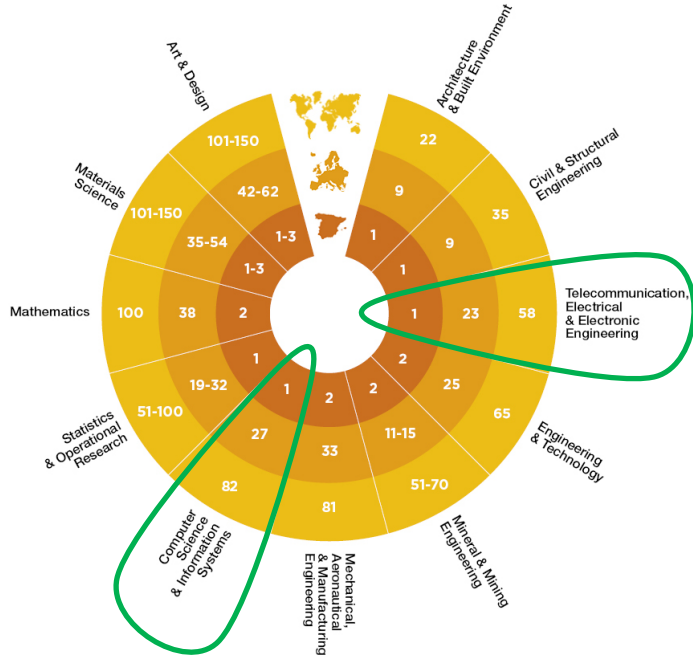- More may materialize during the next course!

MASTEAM
Why study here?

EETAC Building (Castelldefels)

Some facts and figures (1)

QS World University Rankings by Subject, 2023

Source: QS World University Rankings, 2023

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

UPC & 5G

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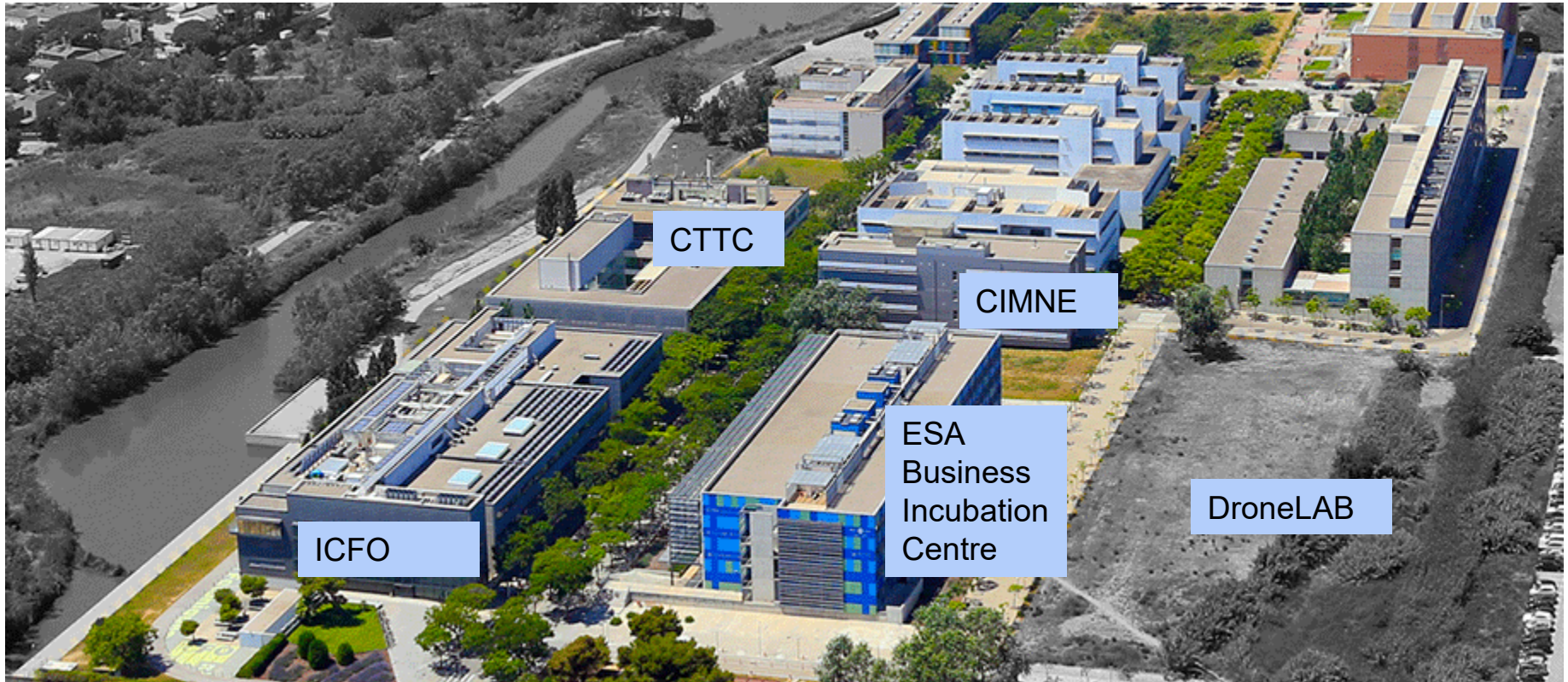

Local and EU H2020 research project – many MASTEAM professors involved
i2Cat, **UPC**, **CTTC**, Atos, Telefonica, MWCapital, local & regional government, among other partners
Presence of local partners in 22 out of the 37 5G-related H2020 EU projects

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

Agriculture School

EETAC

Student's residence

Library/Cafeteria/ Administration

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

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
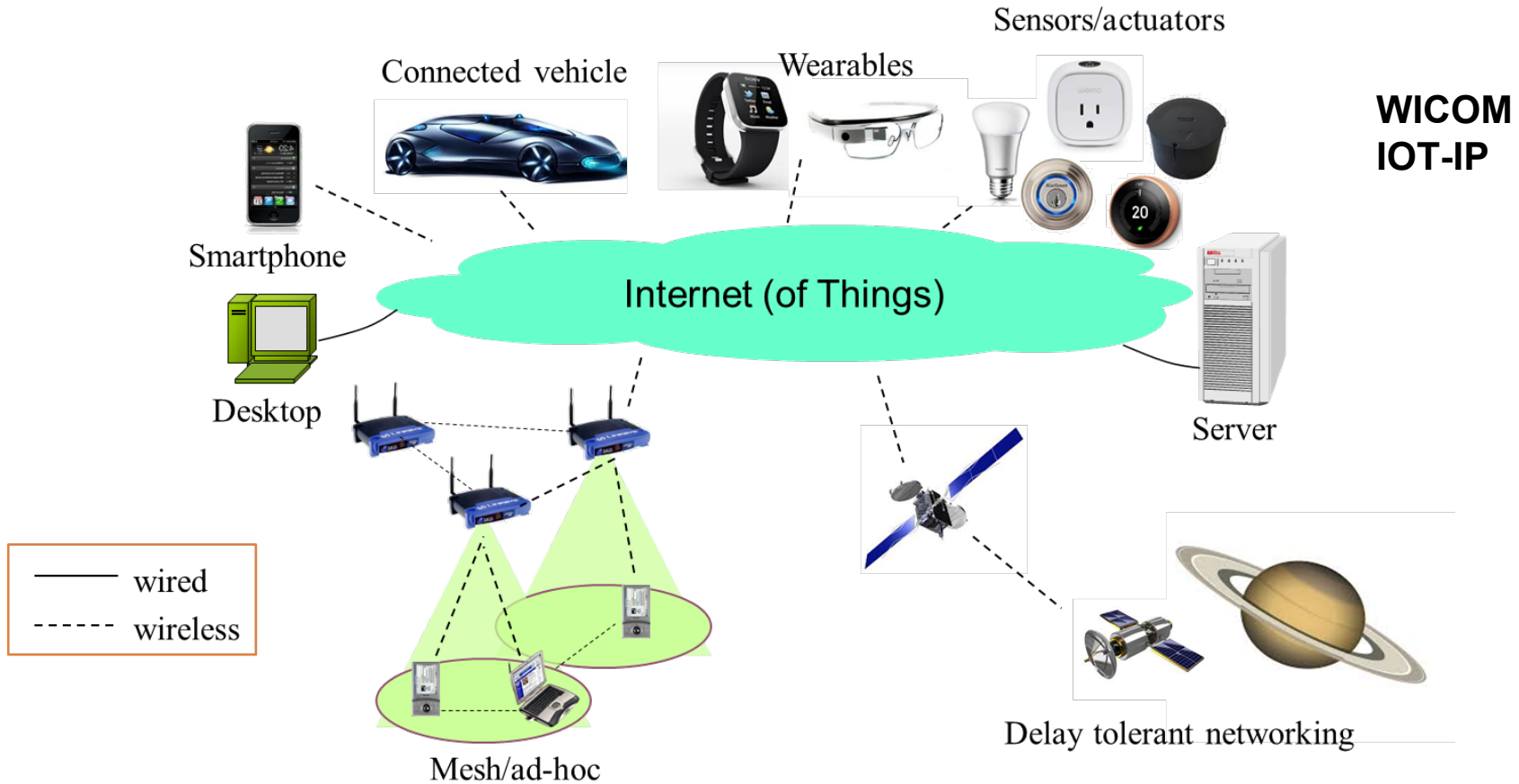
Our faculty also participates in

- Editorial boards of high-impact scientific journals
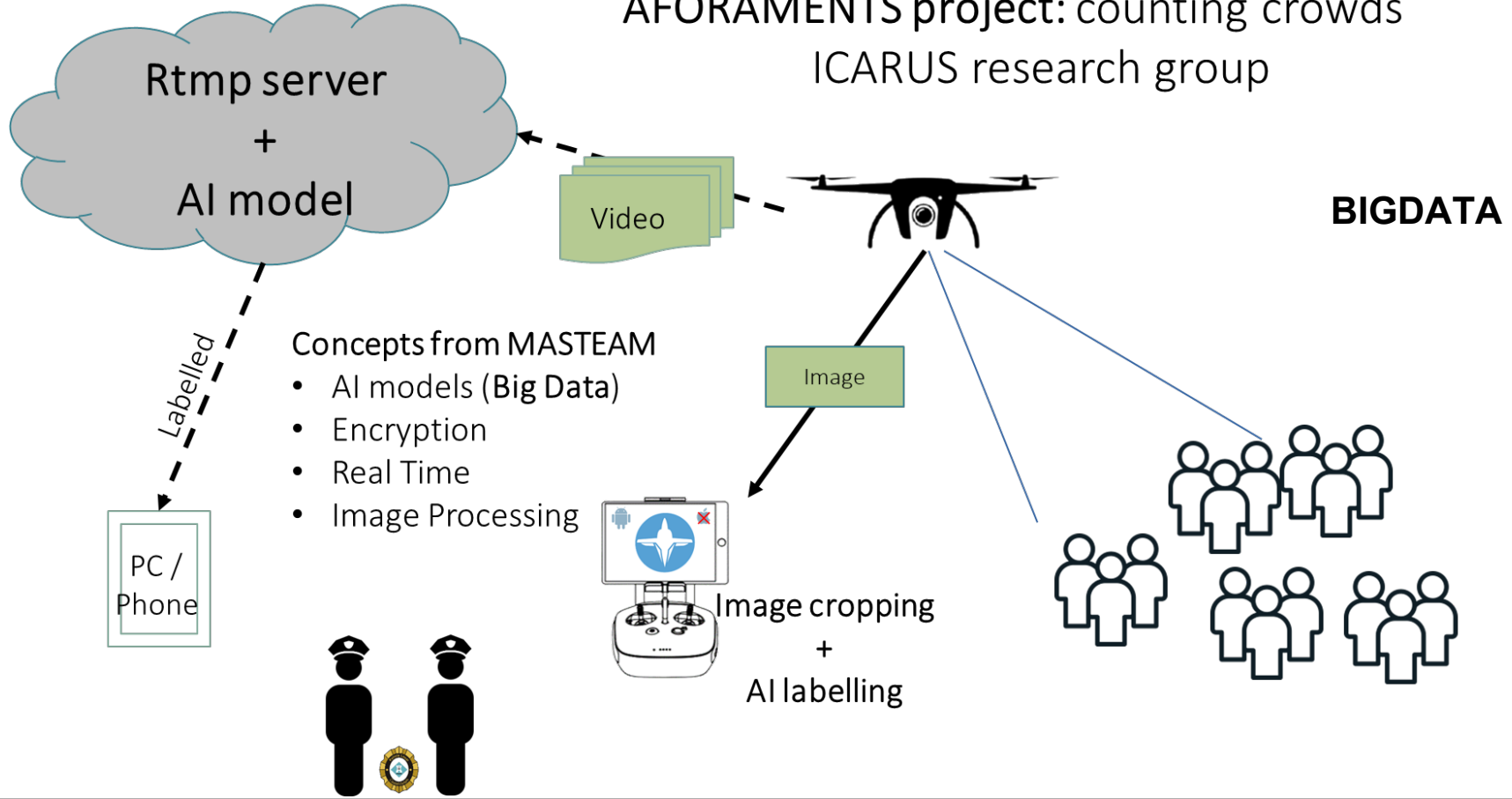- Committees devoted to the definition of communication protocols
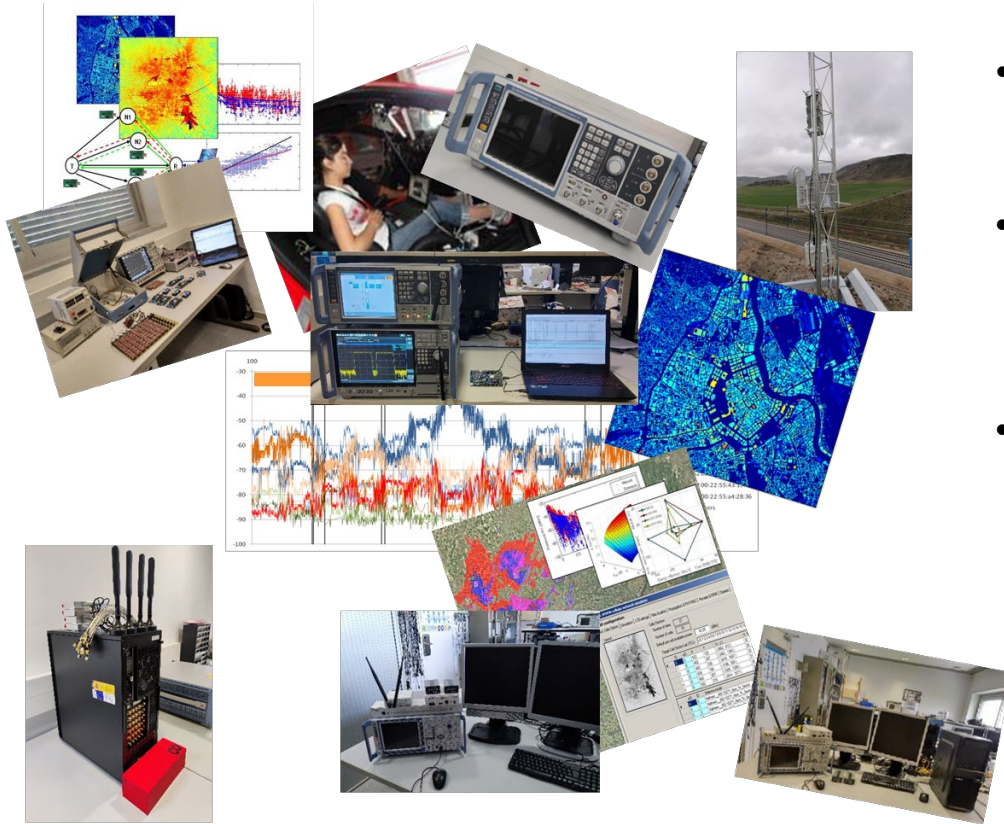
- Flying Internet of EveRything Communication Enhancements (FIERCE)

- 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

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

AFORAMENTS project: counting crowds

ICARUS research group

Rtmp server + AI model

Video

BIGDATA

Labelled

PC / Phone

Concepts from MASTEAM
- AI models (**Big Data**)
- Encryption
- Real Time
- Image Processing
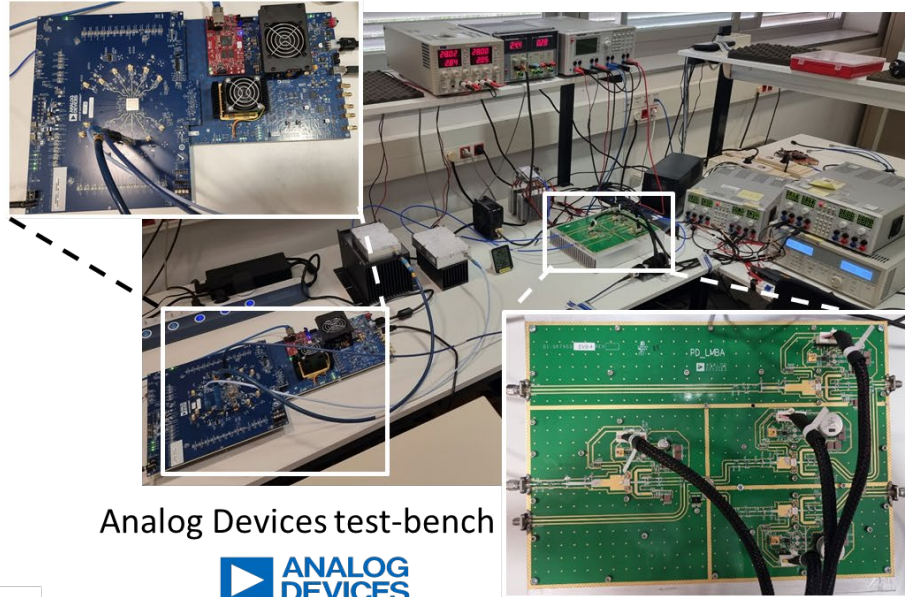
Image

Image cropping + AI labelling

Software Defined Radio (SDR):

Characterization and modeling of nonlinear systems. Digital predistortion (DPD) linearization of highly efficient power amplifiers.
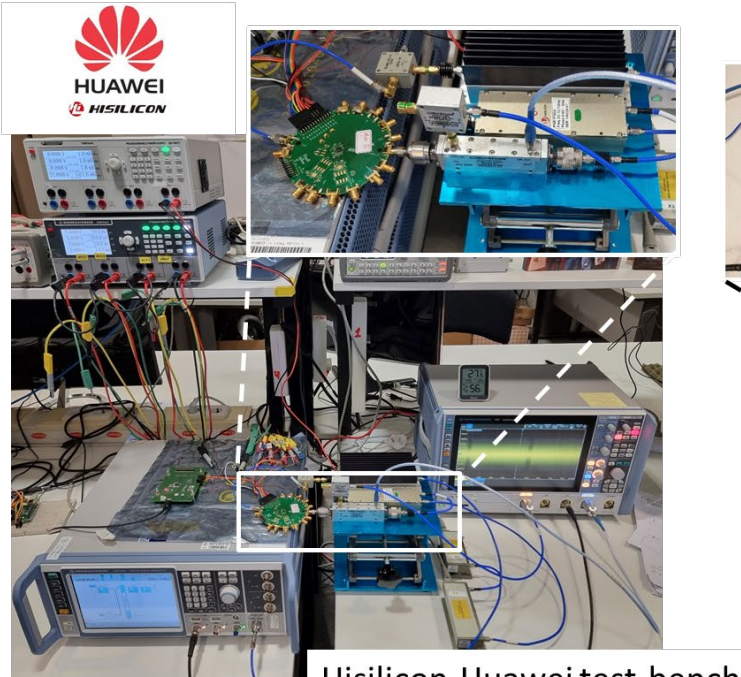
Hisilicon-Huawei test-bench

Analog Devices test-bench

DPD linearization of power amplifiers for mobile terminals with non-flat frequency response and considering dynamic resource block allocation.
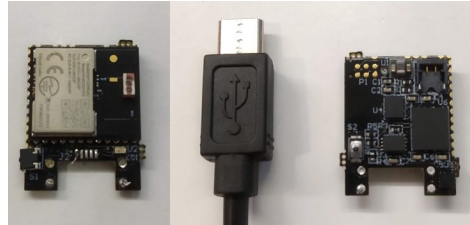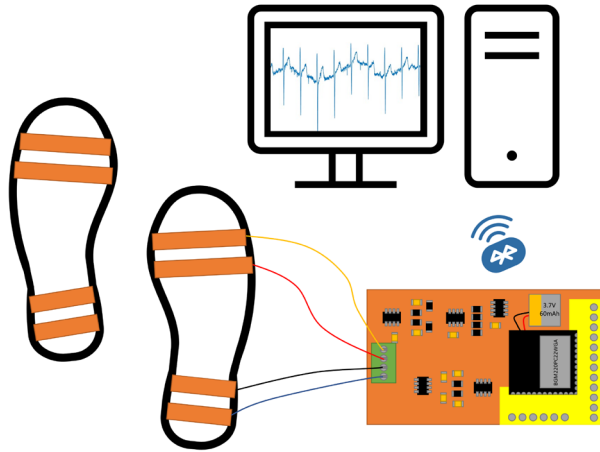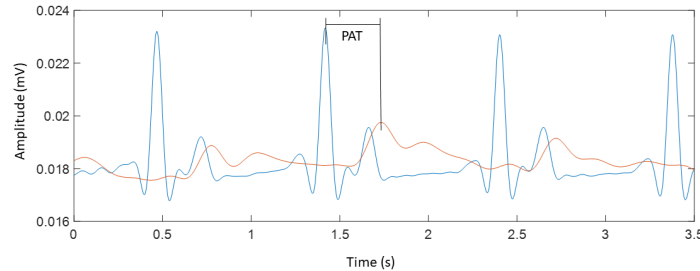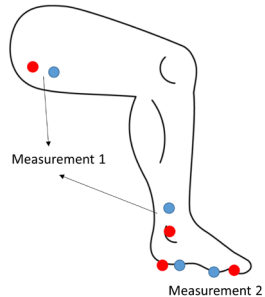
Artificial Intelligence and machine learning solutions to linearize dual-input, high-efficiency load-modulated balanced amplifiers for base stations.

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 (including those in R&D centers)
- 76% find a job in less than 3 months
- LinkedIn: 220+ contacts

228 resultados

Eduard Garcia-Villegas · 2º
Researcher and Wi-Fi expert - Ass. Prof. in UPC's Department of...
Greater Barcelona Metropolitan Area
Anterior: Academic Program Coordinator (**MASTEAM**) en Universitat Politècnica de Catalunya
Wathiq Mansoor, Francesc Tarrés y 24 contactos más en común

Fsc. Xavier Escayola Elias · 2º
Head of Bioengineering Group en Hospital Sant Joan de Déu...
Greater Barcelona Metropolitan Area
Reconocimientos y premios: Best academic grade in the engineer's degree and **MASTEAM** (2009)
Victoria Julia Ovejas Benedicto, Marcos Quilez Figuerola y 6 contactos más en común

Rolando Guerra-Gómez, PhD · 2º
PhD | Senior Telecom Engineer and Researcher | AI/ML |...
Barcelona
Extracto: ...and Engineering Management (**MASTEAM**) from Universitat...
Néstor López Serveto, Juan Martínez Rossi y 1 contacto más en común

Miquel Franco Rius · 2º
Senior Hardware Engineer - Team Leader at Lear Corporation
Gavà

MASTEAM
Acces & Admission process

- 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

  - ➢ Non-homologated bachelor studies: the UPC will verify that the studies 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 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

- Spanish students outside UPC who have **not been awarded** the bachelor's degree can obtain a conditional admission if they are missing their Bachelor's thesis

- The admission will become permanent if they obtain their degree before October 31st (Autumn intake) or February 28th (Spring intake), else you will not be allowed to continue your studies

- Master's program admission are also open to UPC bachelor's degree students who have **not been 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
- Those students will have to be awarded the Bachelor's degree before being awarded the Master's degree

- An official Bachelor's 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)

- 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)

- **ID/Passport**
- **Curriculum vitae**, **motivation letter** and **two letters** of recommendation (from a professor and/or former employer, with institutional e-mail)
- **Copy of your bachelor's degree,** and **academic record/transcript of records** Non-EHEA candidates:
  1. Diplomatic legalization of degree and transcript (Ministry of Education+Ministry of Foreign affairs+ Spanish Embassy – or the Hague Apostille)
  2. 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).
- **Other Master's or Bachelor's degree**, or unfinished higher education studies: add your transcript of records and/or degree certificate

Calendar

- Candidates wishing to start their studies in September 2024 (Autumn 2024 intake) should apply during the pre-enrolment period open from **January 2024 to July 1st 2024**
- Non-European Union nationals should apply <u>as soon as possible</u> (Spanish Embassies/Consulates are quite busy with visa applications!)
  - ➤ Note that **we do not have any kind of influence on any Embassy**, 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!

- The MASTEAM Academic Committee will assess your documentation and will decide on the admission of each candidate (processing time varies depending on the time spent verifying the documents, or if more information is required from the candidates)

- Positive decision: You may accept or not the admission proposal

- If you foresee that the visa application will still be in process at the beginning of the semester, you may ask for a deferral of the start of your studies for the following semester (administrative fees apply)

Further information

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

Thank you for your assistance!

Questions?