ANNUAL REPORT

2018/2019

School of Engineering

Universitat Autònoma de Barcelona

escola d'enginyeria

UAB Universitat Autònoma de Barcelona

INDEX

Foreword by the Director

For a long time, and increasingly we are surrounded by technology. This has changed dramatically in few years the way we communicate, work, and socialize... ultimately the way we understand the world.

Our society requires more professionals with the necessary skills to keep, repair, innovate and lead the next technological revolution, and for that reason the School of Engineering at UAB offers a series of engineering studies leading the present and targeting to the future.

Our engineering studies are very challenging and advanced, so if you as a future student have an interest in mathematics and analytical skills, are self-taught and have a passion for technology, you will certainly have a great future in the field of engineering.

The headquarters of the School of Engineering is located in one of the most important technological and industrial regions in Europe, with the greatest concentration of companies and research centers, where the constant development of new technology opens a wide range of working possibilities in the sectors of agriculture, industry and services.

Indeed, if you look for a University with close ties of cooperation with national and international companies and research centers, with the highest standards of development of teaching and research projects, the School of Engineering will be the right place for you.

Daniel Franco Puntes

Director of the School of Engineering

April 25th, 2019

1. The School of Engineering

1.1 Basic Identification Data

Responsible of the Center	Daniel Franco Puntes (dr.escola.enginyeria@uab.cat) Tel. + 34 93 581 3333
Responsible of this report [1]	Jordi Gonzalez Sabaté
Period covered	June 1st 2018 – May 31th 2019

Official Academic Degrees at the School of Engineering, coordinated by UAB				
Name Catalan / English	**DGU / RUCT Codes**	**ECTS**	**Starting Year**	**Coordinator**
Grau Gestió Aeronàutica / Aeronautical Management	286 / 2501233	240	2009-10	Narciso Farias, Mercedes E.
Grau Enginyeria Informàtica / Computer Engineering	352 / 2502441	240	2010-11	Pons Aroztegui, Jordi
Grau Enginyeria de Sistemes de Telecomunicació / Telecom Systems Eng	445 / 2500898	240	2010-11	López Salcedo, José Antonio
Grau Enginyeria Electrònica de Telecomunicació / Electronics Engineering for Telecommunication	446 / 2500895	240	2010-11	Martin Martínez, Javier
Grau Enginyeria Química / Chemical Engineering	448 / 2500897	240	2010-11	Blánquez Cano, Paqui
Grau de Gestió de Ciutats Intel.ligents i Sostenibles / Management of Smart and Sustainable Cities	3029 / 2503743	180	2017-18	Ribas Xirgo, Lluís
Grau en Enginyeria de Dades / Data Engineering	3001 / 2503758	240	2018-19	Gil Resina, Debora
MU en Enginyeria de Telecomunicacions / Telecommunications Engineering	1179 / 4313797	90	2013-14	López Vicario, José
MU en en Logística i Gestió de la Cadena de Subministrament / Logistics and Supply Chain Management	1193 / 4313489	120	2013-14	Ramos González, Juan José
MU en Visió per Computador / Computer Vision	1336 / 4314099	60	2013-14	Vanrell Martorell, Maria Isabel
MU en Enginyeria Biològica i Ambiental / Biological and Environmental Engineering	1380 / 4314579	90	2014-15	Suárez Ojeda, María Eugenia
MU en Enginyeria Informàtica / Computer Engineering	1381 / 4314660	90	2014-15	Sikora, Anna Bárbara
MU en Gestió Aeronàutica / Aeronautical Management	1459 / 4313785	60	2014-15	Moreno Ortiz, Romualdo
MU en Internet dels Objectes per a Salut Digital / Internet of Things for e-Health	2973 / 4316624	60	2018-19	Carrabina Bordoll, Jordi
Official Academic Degrees at the School of Engineering, not coordinated by UAB				
MU en Seguretat de les Tecnologies de la Informació i de les Comunicacions (UOC) / Information and Communication Technology Security	918 / 4312898	60	2011-12	Navarro Arribas, Guillermo

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[1] We would like to gratefully acknowledge Lola Caballero, Josep Maria Campuzano, Montserrat Carné, Noemi Jiménez, Marta Ramirez, Encarna Rivallo, Jordi Pons, Francisco Quesada, María Eugenia Suárez-Ojeda and Lluís Trulls for their contributions for this edition of the annual report.

1.2 History

The School of Engineering in its two headquarters, Bellaterra and Sabadell, hosts the majority of engineering studies currently offered by the **Universitat Autònoma de Barcelona** (UAB), specifically in the fields of computer engineering, electronics and telecommunication engineering, chemical engineering and aeronautical management. In fact, the School of Engineering offers such vanguard engineering studies in one of the most important technological and industrial areas of the country, with the largest concentration of R&D and high-tech companies and centres. As a result, the School of Engineering is also focused on a range of cutting-edge research geared towards the future, together with opening the range of strategic collaboration possibilities with the industry.

It is worth to note that the engineering studies at UAB were taught long before the foundation of the School of Engineering. In fact, its creation was the result of the continuous commitment since the early 70s of UAB for developing the studies in engineering with the highest quality possible, and its history is described next.

In September 1972, UAB first offered studies in **Computer Engineering** at the Faculty of Sciences, back then under the Computer Science Department created by the decree 1135/1972 of April 20th 1972 (BOE number 106, May 3rd 1972), which was leader in Spain and the first one in Catalonia in an university context [2]. Subsequently, the degree was renewed with different revisions of the syllabus: Plan 5:01/07/1976 and update 01/30/1982; Plan 57:06/01/1992; Plan 176:27/11/1997; and Plan 471: 20/11/2001.

An increasing demand of computer engineering experts at the late 80s originated the creation of the University School of Informatics (**Escola Universitària d'Informàtica, EUI**) on September 12 1988, in Sabadell, by the decree 259/1988 of the Generalitat of Catalonia (DOGC 1051, October 3 1988, page 3676). The technical studies launched during the course 1993-94 at this School in Sabadell were different specializations of Informatics, which were converted into the degrees of Technical Engineering in Computer Systems, and Technical Engineering in Computer Management. During this academic year 2018-19, several commemorative events were held in order to **celebrate the 25th anniversary of the creation of the Campus of Sabadell**, where 7.325 students have graduated since then. The official commemoration event was hold on March 7th 2019, where among other talks, Dr. Esteve Deu was invited to give a talk entitled "Sabadell, from industry to services".

In February 1993, UAB launched the studies of **Electronic Engineering** (Plan 13/01/1993), which were initially made jointly with the Universitat de Barcelona (UB), so that students could take courses at both universities. Later, both courses were split into two separate degrees by the Plan 445:12/10/2000. Significantly, this was the first time that such studies were not taught in an Industrial Engineering School. The Electronic Engineering degree at UAB was a second cycle title, and its students came mainly from the first cycles of Physics and Computer Science, as well as from another engineering specialties.

The studies of **Chemical Engineering** were initiated during the academic course 1993-1994 (Plan 10/8/1995), a year after the official publication of the general guidelines of this new

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[2] The (rather troublesome) origins of Computer Science at UAB can be read via this link (in Spanish).

degree. The creation of a degree of Chemical Engineering constituted the fulfilment of a long vindication mainly coming from the specialization in Industrial Chemistry within the studies of Science (Chemistry Section, Faculty of Sciences, UAB). The decree of 2002 (Plan 22/8/2002) combined (i) the formation of generic chemical engineers establishing a common syllabus shared together with UB and Universitat Politècnica de Catalunya (UPC), with (ii) the opportunity to achieve an specialization in two (back then) emerging Chemical Engineering fields: Biochemical Engineering and Environmental Engineering.

This increment in the number of engineering studies at UAB led to the creation of the Higher Technical School of Engineering (**Escola Tècnica Superior en Enginyeria, ETSE**), formally created on April 28 1998 at the Bellaterra Campus, by the decree 105/1998 of the Generalitat of Catalonia (DOGC 2631, May 4 1998, page 5636), whose first director was Dr. Francisco Serra Mestres. The academic lectures during the academic course 1998-99 were still done at the C building of the Faculty of Sciences at UAB, but since the academic year 2000-01, all the academic activity and personnel moved to the new building Q, much better adapted to the specific needs of engineering teaching and research.

The studies of **Materials Engineering** began during the academic year 2001-2002 (Plan 22/11/2001) as a second-cycle degree, continuation of first cycles of Physics, Engineering of Mines, etc. This study had responded to the experience accumulated in this field and our university in collaboration with the *Institut de Ciència de Materials* at the Bellaterra campus.

That same year, the studies of **Telecommunications Engineering** (Electronic Systems, Plan 22/11/2001) started as a first cycle degree, subsequently offering the possibility of access to the second cycles of both Electronic Engineering and Telecommunications Engineering. The full Telecommunication Engineering studies were launched in the academic year 2004-2005 (Plan 24/10/2003), offering a natural way to continue the studies of the Telecommunica-tions Technical Engineering

During the same academic year 2004-2005, the studies of **Aeronautical Management** (Plan 14/07/2004) were also initiated in Spain at UAB, with the invaluable help of *Embry-Riddle Aeronautical University of Daytona Beach*, just after the Universidad Autónoma de Madrid. Also during the academic year 2004-2005, the School of Industrial Engineering at Mollet del Vallès joined the SE-UAB (specialization in Industrial Chemistry, Plan 20/06/2006). This School had been previously affiliated to UPC since 1996.

Subsequently, following the standards for the adaptation of our University to the European High Education Area (EHEA), all the undergraduated degrees were adapted according to RD 1393/2007, and two new Official Master programs started in the academic year 2006-2007: the MSc **in Advanced Computer Science** and the MSc in **Micro and Nanoelectronics**.

It is worth to note that the Generalitat de Catalonia bestowed ETSE with the **distinction *Jaume Vicens Vives 2007*** for the efforts of the different professional sections of ETSE (administration service staff or PAS, teaching staff, and students) in adapting teaching methods and administrative structures to the EHEA directives.

As a result of this growth in Engineering studies at UAB, the current **School of Engineering** was finally created by merging ETSE of Bellaterra and EUI of Sabadell by the decree 333/2009 of Generalitat of Catalonia (DOGC 5415, July 7 2009. page 54551).

Subsequently, the adaptation of our engineering studies to EHEA finished in the academic year 2010-2011, giving birth to the current 7 degrees: **Aeronautical Management; Chemical Engineering; Computer Engineering; Electronics Engineering for Telecommunication; Telecommunications System Engineering; Computer Engineering (Specialisation Information Technologies) + Telecom. Systems Engineering; and Computer Engineering (Specialisation Computer Engineering) + Telecommunication Electronic Engineering.**

In addition to these undergraduated programmes, the School of Engineering offers since the academic year 2012-2013 the Official Master's degrees on **Logistics and Supply Chain Management; Aeronautical Management; Computer Vision; Telecommunications Engineering**; and since the academic year 2014-2015, the SE-UAB offers the Official Masters on **Biological and Environmental Engineering** and **Computer Science**. In addition, the School of Engineering also participates in the Official Master on **Security in Information Technology and Communications**, and inter-university Master coordinated by the UOC.

Recently, the School of Engineering has been involved in launching four new courses: the undergraduated course in **Smart and Sustainable Cities** and the UAB-specific postgraduate course in **Big Data for Life Sciences**, which started in this academic year 2017-2018; and the undergraduated course in **Data Engineering**, the Official Master in the **Internet of Things for eHealth**, which started in this academic year 2018-2019. Moreover, next academic course 2019-2020, the School of Engineering will offer the UAB-specific Master's degree in **Engineering in Mobile Device Applications.** This exemplifies the high preparation, initiative and determination of our academic staff for providing the best education to UAB students.

In fact, the vast majority of the teaching staff of these academic degrees comes from different Departments of the School of Engineering. These departments are responsible for not only the research, but also the transfer of technology with our industry, in a quite broad variety of engineering fields.

Summarizing, the high-level scientific production of such departments, together with the hard work of the personnel of administration and services (PAS), and the learning dedication of the students, have jointly allowed the School of Engineering to achieve very competitive academic performance figures, indicators and measures, which are detailed next and until the end of this report.

Figure: 40th anniversary commemorative plaque presented by UPC to the School of Engineering (UAB).

1.3 Student Enrolments

During 2018-19, the School of Engineering offers 5 undergraduate degrees and 2 double degrees. Students currently enrolled in these studies are summarized in the next table (* denotes a unique access system for the 2 Telecommunications degrees).

EHEA Official Bachelor's degrees	Available admissions	Mobility students	New admissions	Rest of students	Total enrolments
Aeronautical Management	65	0	62	187	**249**
Computer Engineering	240	6	253	794	**1.047**
Chemical Engineering	80	1	81	233	**314**
Telecommunications System Engineering *	70 *	1	70 *	119	**189**
Electronics Eng. for Telecommunications *	70 *	2	70 *	115	**185**
Data Engineering	40	0	39	0	**39**
Mgmt. of Smart and Sustainable Cities	60	0	59	8	**67**
Computer Engineering (Spec. Computer Eng.) + Telecom. Electronic Engineering	20	0	21	39	**60**
Computer Eng. (Spec. Information Technologies) + Telecom. Systems Eng.	20	0	22	59	**81**
TOTAL	*665*	*10*	*677*	*1.554*	*2.231*

Regarding our official master's degrees, valid in all of Spain and equivalent to any master's degrees in Europe and giving access to a PhD programme, the number of enrolments are:

Official University Master's Degree	Total Enrolments
Biological and Environmental Engineering	50
Computer Vision (Coordination, Interuniversity)	42
Logistics and Supply Chain Management (Coordination, Erasmus Mundus)	36
Telecommunication Engineering	35
Aeronautical Management	33
Computer Engineering (discontinued)	26
Internet of Things for eHealth	8
TOTAL	*230*

Regarding the PhD Programmes regulated by RD99/2011, those ones involving academic staff of the Engineering School are:

PHD Programs (with Excellent Mention)	Total Enrolments
Environmental Science and Technology (Plan 1233)	138
Computer Science (Plan 1239)	105
Electrical and Telecommunication Engineering (Plan 1225)	75
Biotechnology (Plan 1230)	56
TOTAL	*374*

Overall, in 2018-2019, a total of **2,835 students** were registered in Bachelor, Master and PhD degrees involving academic personnel of the School of Engineering.

1.4 Enrolment and Graduation Evolution and Statistics

This section describes the evolution in the number of student enrolments and graduations during the last 5 academic years[3].

The following table shows the number of students **registered** in EHEA bachelor's degrees:

Acad. Year	Comp. Eng.	Chem. Eng.	Telecom. Systems	Telecom. Electr.	Data Eng.	Smart Cities	Aeron. Managt.	Comp. Eng. + Elec. Eng.	Comp. Eng. + Telecom. Sys.	TOTAL
2014/15	980	329	220	175	-	-	274	33	42	**2.053**
2015/16	1.021	339	216	205	-	-	261	53	45	**2.140**
2016/17	1.037	342	199	192	-	-	268	62	63	*2.163*
2017/18	1.060	331	184	188	-	10	255	72	68	*2.168*
2018/19	**1.047**	**314**	**119**	**189**	**39**	**67**	**249**	**60**	**81**	*2.165*

The next tables detail the data for new students (number of available admissions, received requests, new admitted students) and the evolution of the cut-off marks until 2017-18 (* denotes a unique access system for the 2 Telecommunications degrees):

Acad. Year	Computer Engineering				Telecommunications System Engineering *				Electronics Engineering for Telecommunication *			
	Available Admissions	Petitions	New admitted	Cut-off mark	Available Admissions	Petitions	New admitted	Cut-off mark	Available Admissions	Petitions	New admitted	Cut-off mark
2014-15	270	801	279	5.46	70	260	82	5.00	70	137	49	5.00
2015-16	270	847	276	5.96	70	258	74	5.00	70	133	74	5.00
2016-17	270	1006	270	6.47	70*	155*	57*	5.06*	70*	155*	57*	5.06*
2017-18	270	998	268	6.71	70*	156*	57*	5.00*	70*	156*	57*	5.00*
2018-19	**240**	**1,118**	**253**	**7.41**	**70***	**150***	**70***	**5.00***	**70***	**150***	**70***	**5.00***

Acad. Year	Chemical Engineering				Aeronautical Management			
	Available Admissions	Petitions	New admitted	Cut-off mark	Available Admissions	Petitions	New admitted	Cut-off mark
2014-15	80	436	79	6.16	65	221	65	5.01
2015-16	80	391	84	6.76	65	243	62	5.96
2016-17	80	449	81	5.93	65	280	65	6.37
2017-18	80	452	77	5.45	65	271	63	6.96
2018-19	**80**	**509**	**81**	**6.38**	**65**	**284**	**62**	**6.53**

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[3] The figures for the academic years 2014-15 until 2017-18 were obtained from: http://winddat.aqu.cat/ca/universitat/22/unitat/22080711231/estudis; and for the total number of enrolments during the current academic year 2018-19 (until April 28th, 2019), the following repository was used: http://siq.uab.cat/siq_public/centre/115/

Acad. Year	Data Engineering				Smart and Sustainable Cities			
	Available Admissions	Petitions	New admitted	Cut-off mark	Available Admissions	Petitions	New admitted	Cut-off mark
2018-19	**40**	**308**	**39**	**8.17**	**60**	**179**	**59**	**5.00**

Acad. Year	Computer Engineering (Specialisation Information Technologies) + Telecom. Systems Engineering				Computer Engineering (Specialisation Computer Engineering) + Telecom. Electronic Engineering			
	Available Admissions	Petitions	New admitted	Cut-off mark	Available Admissions	Petitions	New admitted	Cut-off mark
2014-15	20	210	23	6.83	20	130	21	5.00
2015-16	20	235	25	7.04	20	152	21	5.32
2016-17	20	188	20	6.89	20	134	22	5.91
2017-18	20	171	22	6.63	20	180	20	6.55
2018-19	**20**	**229**	**22**	**8.94**	**20**	**167**	**21**	**7.04**

The following table shows the number of students **graduated** in EHEA bachelor's degrees who started on the academic year 2010-2011 (for the double degrees, Computer Engineering has been considered) until April 28th, 2019:

Starting Year	Comp. Eng.	Chem. Eng.	Telecom. Systems	Telecom. Electr.	Aeron. Managt.	TOTAL
2010/11	119	51	13	30	38	**251**
2011/12	108	41	20	19	50	**238**
2012/13	131	46	13	20	41	**251**
2013/14	91	43	12	15	29	**190**
2014/15	**54**	**28**	**7**	**3**	**24**	*116*

Regarding Master studies, the next table details the evolution of **new students registered** at Official Master's degrees per year, since the academic course 2014/15 until April 28th, 2019.

Acad. Year	Biolog Amb. Eng.	Telecom. Eng.	Comp. Eng.	Aeron. Mngt	Logistics, Supply Chain Mngt	Computer Vision	IoT eHealth	TOTAL
2014/15	12	13	8	28	8	32	-	**101**
2015/16	19	25	6	28	13	30	-	**121**
2016/17	10	22	16	40	20	30	-	*138*
2017/18	24	10	22	33	13	30	-	*132*
2018/19	**25**	**19**	**-**	**29**	**20**	**27**	**8**	*128*

And the next Table details the number of students who have **finished** the Master studies until April 28th, 2019:

Acad. Year	Biolog Amb. Eng.	Telecom. Eng.	Comp. Eng.	Aeron. Mngt	Logistics, Supply Chain Mngt	Computer Vision	TOTAL
2014/15	9	9	6	26	6	25	**81**
2015/16	18	20	4	28	8	27	**105**
2016/17	7	18	12	36	15	23	**111**
2017/18	**15**	-	-	**26**	-	**19**	*60*

The next table details the total number of PhD students registered yearly to those Official PhD Programs with a considerable involvement of SE-UAB academic staff.

Academic Plans	PhD Programme	Total number of students					
		2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
1023, 1233	Environmental Science and Technology	144	142	131	146	140	**138**
1060, 1239	Computer Science	81	96	101	105	116	**105**
1046, 1225	Electrical and Telecommunication Eng.	62	64	73	88	89	**75**
1020, 1230	Biotechnology	55	60	58	53	60	**56**

And the next table details the number of finished PhDs since 2013/2014 until April 28th, 2019, the PhDs with Cum Laude, and PhDs with either European or International Mention:

PhD Programmes with SE-UAB involvement (until April 28th, 2019)	• Total Number of PHDs • Number of PhDs with Cum Laude • Number of PhDs with EU/Intl Mention					
	2013/14	2014/15	2015/16	2016/17	2017/18	**2018/19**
Environmental Science and Technology	20	28	30	24	16	**9**
	13	17	15	14	6	**6**
	5	13	10	14	8	**2**
Biotechnology	9	12	20	8	10	**4**
	8	10	18	6	9	**4**
	2	3	8	3	5	**3**
Computer Science	11	20	18	17	7	**14**
	9	18	16	15	6	**7**
	4	13	6	7	3	**9**
Electrical and Telecommunication Engineering	10	8	7	10	9	**8**
	7	6	4	8	6	**6**
	0	1	2	2	4	**5**

To conclude this chapter, we show (**in Catalan**) few official statistics regarding the 5 fully implemented Bachelor Degrees:

- Computer Engineering:

Perfil nou ingrés

8%
92%

- Dones
- Homes

Mitjana d'edat	**19**
Dones	20
Homes	233

(any 2018)

	Edat	Dones	Homes
2017	19	23	251
2016	20	20	254
2015	20	21	252
2014	20	15	260
2013	20	15	257
2012	20	19	284
2011	21	25	272
2010	20	35	265

Rendiment

- Rendiment *
- Rendiment dels estudiants de nou ingrés

	Rendiment	Rendiment nou ingrés
2017	70,45%	58,27%
2016	72,13%	59,69%
2015	71,13%	61,83%
2014	70,43%	56,61%
2013	70,24%	55,15%
2012	66,13%	55,48%
2011	54,41%	48,75%
2010	36,69%	37,58%

* Rendiment = nombre de crèdits superats / crèdits matriculats

Nota de tall

- Nota de tall
- Nota mitjana *

Any	Nota de tall	Nota mitjana*
2018	**7,41**	**8,79**
2017	6,71	8,24
2016	6,47	7,69
2015	5,96	7,48
2014	5,46	6,96
2013	5,15	6,96
2012	5,33	6,88
2011	5,02	6,63
2010	5	7,17

* Mitjana de la nota d'entrada dels estudiants de nou accés a la titulació inclouent totes les modalitats .

- Chemical Engineering:

Perfil nou ingrés

46%
54%

- Dones
- Homes

Mitjana d'edat	**19**
Dones	37
Homes	44

(any 2018)

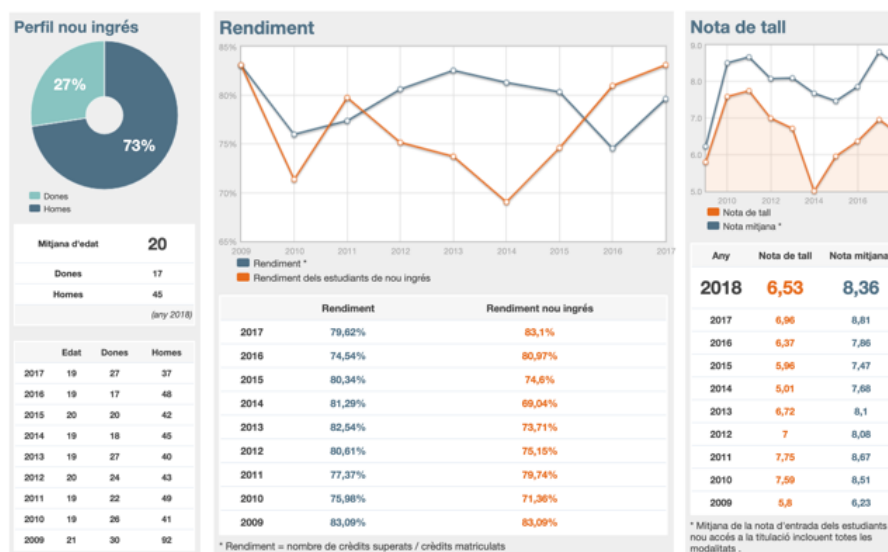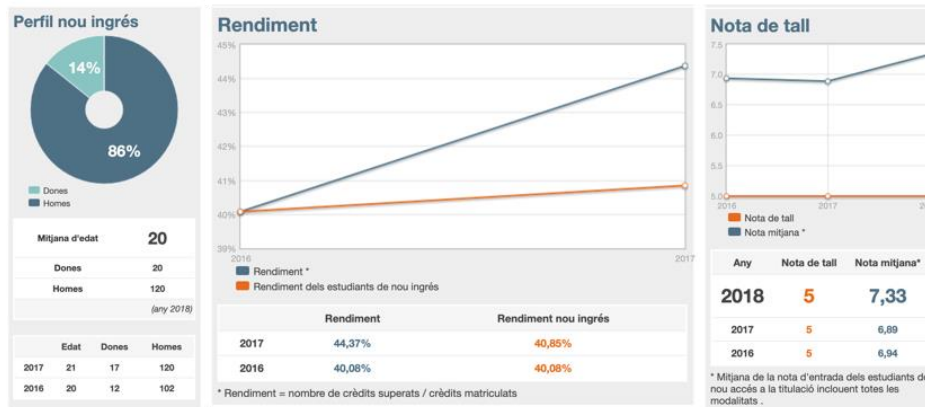|	Edat	Dones	Homes
2017	19	24	55
2016	20	32	46
2015	20	26	58
2014	19	29	48
2013	19	26	58
2012	20	30	63
2011	20	35	51
2010	19	32	58

Rendiment

- Rendiment *
- Rendiment dels estudiants de nou ingrés

	Rendiment	Rendiment nou ingrés
2017	77,18%	65,94%
2016	76,53%	67,18%
2015	74,61%	68,96%
2014	71,28%	64,94%
2013	72,64%	63,86%
2012	64,79%	56,29%
2011	64,16%	53,95%
2010	49,03%	50,75%

* Rendiment = nombre de crèdits superats / crèdits matriculats

Nota de tall

- Nota de tall
- Nota mitjana *

Any	Nota de tall	Nota mitjana*
2018	**6,38**	**8,32**
2017	5,45	8,3
2016	5,93	8,18
2015	6,76	7,97
2014	6,16	7,42
2013	6,54	7,66
2012	6,58	7,55
2011	6,09	7,25
2010	5	7,85

* Mitjana de la nota d'entrada dels estudiants de nou accés a la titulació inclouent totes les modalitats .

- Aeronautical Management:

Perfil nou ingrés

27%
73%

- Dones
- Homes

Mitjana d'edat	**20**
Dones	17
Homes	45

(any 2018)

	Edat	Dones	Homes
2017	19	27	37
2016	19	17	48
2015	20	20	42
2014	19	18	45
2013	19	27	40
2012	20	24	43
2011	19	22	49
2010	19	26	41
2009	21	30	92

Rendiment

- Rendiment *
- Rendiment dels estudiants de nou ingrés

	Rendiment	Rendiment nou ingrés
2017	79,62%	83,1%
2016	74,54%	80,97%
2015	80,34%	74,6%
2014	81,29%	69,04%
2013	82,54%	73,71%
2012	80,61%	75,15%
2011	77,37%	79,74%
2010	75,98%	71,36%
2009	83,09%	83,09%

* Rendiment = nombre de crèdits superats / crèdits matriculats

Nota de tall

- Nota de tall
- Nota mitjana *

Any	Nota de tall	Nota mitjana*
2018	**6,53**	**8,36**
2017	6,96	8,81
2016	6,37	7,86
2015	5,96	7,47
2014	5,01	7,68
2013	6,72	8,1
2012	7	8,08
2011	7,75	8,67
2010	7,59	8,51
2009	5,8	6,23

* Mitjana de la nota d'entrada dels estudiants de nou accés a la titulació inclouent totes les modalitats .

- Telecommunications System Engineering and Electronics Engineering for Telecommunications (unique access system since 2016):

Perfil nou ingrés

14% / **86%**

- Dones
- Homes

Mitjana d'edat	20
Dones	20
Homes	120
	(any 2018)

	Edat	Dones	Homes
2017	21	17	120
2016	20	12	102

Rendiment

- Rendiment *
- Rendiment dels estudiants de nou ingrés

	Rendiment	Rendiment nou ingrés
2017	44,37%	40,85%
2016	40,08%	40,08%

* Rendiment = nombre de crèdits superats / crèdits matriculats

Nota de tall

- Nota de tall
- Nota mitjana *

Any	Nota de tall	Nota mitjana*
2018	**5**	**7,33**
2017	5	6,89
2016	5	6,94

* Mitjana de la nota d'entrada dels estudiants de nou accés a la titulació inclouent totes les modalitats .

2. Governing Boards

2.1 Basic Governance Data

<table>
<tr><td colspan="3" style="text-align:center">CONTACT GOVERNING TEAM
E-mail: dr.escola.enginyeria@uab.cat
Tel. +34 93 581 3333 – Fax. +34 93 581 3358</td></tr>
<tr><td colspan="2" style="text-align:center">CONTACT ACADEMIC TEAM BELLATERRA
E-mail: ga.enginyeria@uab.cat
Tel. +34 93 581 1301</td><td style="text-align:center">CONTACT ACADEMIC TEAM SABADELL
E-mail: ga.campus.sabadell@uab.cat
Tel. +34 93 728 7712</td></tr>
</table>

Position	Responsible	Contact
Director	Dr. Daniel Franco	dr.escola.enginyeria@uab.cat +34 93 581 3333
Deputy Director, Academic Studies and Quality	Dr. Mercè Rullán	mercedes.rullan@uab.cat +34 93 581 3553
Deputy Director, Finance And Infrastructures	Dr. Gonzalo Seco	gonzalo.seco@uab.cat +34 93 581 4734
Deputy Director, Academic Planning	Dr. Xavier Font	xavier.font@uab.cat +34 93 581 4480
Deputy Director, Students and Mobility	Dr. David Jiménez	david.jimenez@uab.cat +34 93 581 3218
Deputy Director, Promotional and Community Activities	Dr. Antoni Espinosa	antoniomiguel.espinosa@uab.cat +34 93 581 4969
Centre Administrator Bellaterra	Mr. Antoni Montes	antoni.montes@uab.cat +34 93 581 3492
Centre Administrator Sabadell	Mr. Francisco Quesada	francisco.quesada@uab.cat +34 93 728 7717
Academic Services Manager	Mrs. Carme Nebrera	carme.nebrera@uab.cat +34 93 581 3442
Academic Secretary	Dr. Jordi Gonzàlez	jordi.gonzalez@uab.cat +34 93 581 1519

2.2 Governance and Coordination of the School

The governing boards of the School of Engineering are (i) the School Council, (ii) the Permanent Board and (iii) the Director/Dean with his Governing team. You can download the Regulation of the School of Engineering for both Bellaterra and Sabadell Campuses from here (in Catalan): http://www.uab.cat/Document/388/990/ReglamentEE_7juliol2010.pdf

The **Director** exercises the capabilities of direction and daily management of the centre and officially represents the School of Engineering. He is assisted by 6 Deputy Directors, the academic Secretary of the School, and the School Administrator, who all form the **Governing Board**. Up to date, the Directors of the School of Engineering and of the previous EUI (Sabadell) and ETSE (Bellaterra) Schools have been:

- EUI (1988-2009): Jordi Roig (1988-93, 1996-2000), Dolores Rexachs (1993-96), Javier Serrano (1996), Remo Suppi (2000-06), and Jaume Pujol (2006-09).
- ETSE (1998-2009): Francisco Serra (1998-2001), and Joan Sorribes (2001-09).
- School of Engineering (2009-): Joan Sorribes (2009-10), Glòria González (2010-12), Daniel Franco (2012-19) and Ramon Vilanova (2019-).

2.2.1 The School Board

The **School Board** is the most representative body of the School, which chooses the Director and his governing team, prepares, approves and modifies both School regulations and courses of action. It is composed of the Director, permanent and non-permanent professors, graduate interns, postgraduate students and representatives of the personnel of Administration and Services, and the Secretary of the School.

The members of the School Board are elected every 3 years from the permanent professors (A Sector), non-permanent professors (B Sector), students (C Sector) and the personnel of administration and services (D Sector). According to the regulations of the School of Engineering, the proportions among these sectors are established as: 51%, 9%, 30% and 10% for Sectors A, B, C, and D, respectively.

The 7 members of the Governing Board, the 7 Directors of the Departments, the 10 different Coordinators of the undergraduated and Master studies of the School, the Administrator of the centre and the Academic Manager both in the Bellaterra Campus, are ex officio members of the School Board.
The last election was held on November 9-10, 2016, when 155 members of the School Board were elected: 79 (20 ex officio) for Sector A, 14 (4 ex officio) for Sector B, 46 for Sector C and

16 (2 ex officio) for Sector D. Following these proportion ratios defined by the regulations of the School among the different sectors, the teaching hours of each Department, and the number of students for each study, the number of candidates for Sectors A and B for the School Board 2015-2016 were established as follows (the final numbers can be found with NIU/PWD here: https://tpd.uab.cat/tpd/centre/show/115?anyAcademicActual=2015):

| Department | In parenthesis, the ex officio professors not being elected | | | | | | |
	Full-time Professors	Total Hours	% Teaching	Representatives Sector A + Sector B	Total Candidates	Candidates Sector A	Candidates Sector B
Computer Architecture and Operating Systems	12,12	5.091,00	8,34	7 (3) + 1	5	4	1
Computer Science	24,66	10.355,85	16,96	13 (4) + 3	12	9	3
Information and Communications Eng.	19,38	8.139,33	13,33	10 (2) + 2	10	8	2
Electronic Engineering	13,02	5.469,75	8,96	7 (2) + 1 (1)	5	5	0
Chemical, Biological Environmental Eng.	19,96	8.383,77	13,73	11 (3) + 3 (1)	10	8	2
Microelectronics and Electronic Systems	11,74	4.930,9	8,08	7 (2) + 1	6	5	1
Telecommunications and Systems Eng.	18,12	7.610,7	12,46	10 (4) + 2 (2)	6	6	0
Mathematics	12,02	5.049,4	8,27	7 + 1	8	7	1
Business	5,56	2.333,7	3,82	3 + 0	3	3	0
Physics	2,63	1.106,01	1,81	1 + 0	1	1	0
Chemistry	2,43	1.020,15	1,67	1 + 0	1	1	0
Rest of Departments	3,74	1.569,60	2,57	2 + 0	2	2	0
TOTAL SECTORS A, B					**69**	**59**	**10**

The 46 students representing Sector C are yearly selected based on the number of people registered in (undergraduated and Master) engineering studies at the end of the previous academic course, here 2017-2018, grouped in thematic academic sections. The last election was held on December 3rd and 4th, 2018, the number of candidates were established as follows:

Student Section - Sector C	Total Enrolments	% Students	Candidates Sector C
Telecommunications Engineering	460	18,98	9
Computer Engineering	1.302	52,71	24
Chemical Engineering	366	15,10	7
Aeronautical Management	296	12,21	6
TOTAL SECTOR C	**2.424**	**100**	**46**

Finally, 14 candidates were elected from all the personnel of administration and services (PAS), belonging to Sector D.

2.2.2 The Permanent Board

The **Permanent Board** is delegated by the School Board and constitutes the government body for the academic management of the School. It is composed of the Director and members of his team (2 of his Deputy Directors), Directors of Departments, academic coordinators, and elected representatives of professors, students, and personnel of administration and services. The current composition of the Permanent Board is as follows:

1. Bardina Simorra, Xavier
2. Beneite Díaz, Nacho
3. Blánquez Cano, Francisca
4. Cànovas, Catalina
5. Cortés Fité, Ana
6. De Paco Sánchez, Pedro
7. Farré Delgado, Jordi
8. Franco Puntes, Daniel
9. Gesa Bote, Lluís
10. Gil Resina, Debora
11. Gonzalez Sabaté, Jordi
12. Guerrero Méndez, Eloi
13. López Garcia, Cristina
14. López Salcedo, José A.
15. Martín Antolín, Ferran
16. Montes Roldán, Antonio
17. Muela Chuca, Brayan Paul
18. Narciso Farias, Mercedes Elizabeth
19. Nebrera Navas, Carme
20. Pons Aróztegui, Jordi
21. Prim Sabria, Marta
22. Querol Egido, Albert
23. Ribas Xirgo, Lluís
24. San Nicolás Martínez, Miquel Àngel
25. Senar Rosell, Miquel Àngel
26. Serra Sagristà, Joan
27. Valero Barranco, Francisco
28. Valveny Llobet, Ernest
29. Vazquez Castro, Maria Angeles

2.3 The Academic Coordinators

In addition to the Deputy Directors of the Governing Team specifically devoted to addressing the different academic issues at the School, there are other coordinators who help in the different programs and activities created for improving the quality of teaching and its dissemination: Gemma Sánchez, Remo Suppi, Sergi Robles and Andreu Pérez.

2.3.1 Heads of the Academic Sections

From the point of view of academic teaching, the School of Engineering is divided into 4 academic *Sections,* or engineering fields of knowledge. Each Section coordinates the lectures related to a specific engineering domain, aimed at obtaining one or more official bachelor degrees. So the Sections participate in all coordination aspects related to teaching activities for all the degrees. At present, the school is divided into the following sections:

- Section of Computer Engineering
- Section of Chemical Engineering
- Section of Telecommunications Engineering
- Section of Aeronautical Management
- Section of Smart Cities

The **Section Board** is the highest organ of representation of the Section. It is composed of the corresponding Study Coordinator, who chairs the Board; of deputy coordinators (if any); of representatives of those departments involved in teaching within the Section; a representation of the students; and the Academic Manager - or delegate - on behalf of the personnel of administration and services.

Each Section Board is assisted by an **Academic Committee**, composed of representatives of professors and students, whose responsibility is monitoring the correct implementation of the syllabus, addressing problems and complaints from the students, teachers or any other member of the section, related to education and teaching issues.

Academic Section	Coordinators	Contact
Computer Engineering	Dr. Jordi Pons (Head)	**jordi.pons@uab.cat** **+34 93 581 3490**
	Dr. Ramon Baldrich (Mention on Computing)	**ramon.baldrich@uab.cat** **+34 93 581 2592**
	Dr. Xavier Otazu (Mention on SW Eng.)	**xavier.otazu@uab.cat** **+34 93 581 3015**
	Dr. Sergi Robles (Mention on Information Technologies)	**sergi.robles@uab.cat** **+34 93 581 2395**
	Dr. Juan Carlos Moure (Mention on Computer Engineering)	**JuanCarlosMoure@uab.cat** **+34 93 581 3539**
Chemical Engineering	Dr. Paqui Blánquez	**paqui.blanquez@uab.cat** **+34 93 581 1879**
Telecommunications Engineering	Drs. Jose López Salcedo and Javier Martin	**jose.salcedo@uab.cat** **+34 93 581 3562**
Aeronautical Management	Dr. Mercedes E. Narciso	**mercedes.narciso@uab.cat** **+34 93 728 7756**
Smart Cities	Dr. Lluís Ribas	**lluis.ribas@uab.cat** **+34 93 581 1078**

2.3.2 Coordinators of Official Bachelor's degree

The School of Engineering UAB offers 6 bachelor's degrees in different Engineering fields of knowledge. Our bachelor's degrees are well-known for their quality and international character, as well as for the amount of practical experience students acquire in companies.

Bachelor's Degree	Coordinator	Contact
Computer Engineering	Dr. Jordi Pons	**coord.enginyeria.informatica@uab.cat** **+34 93 581 3490**
Chemical Engineering	Dr. Paqui Blánquez	**coord.enginyeria.quimica@uab.cat** **+34 93 581 1879**
Telecommunication Systems Engineering	Dr. José López Salcedo	**coord.enginyeria.telecomunicacio@uab.cat** **+34 93 581 3562**
Electronic Engineering Telecommunication	Dr. Javier Martin	**coord.enginyeria.telecomunicacio@uab.cat** **+34 93 581 3514**
Aeronautical Management	Dr. Mercedes E. Narciso	**coord.gestio.aeronautica@uab.cat** **+34 93 581 4030 / +34 93 728 7756**

Management of Smart and Sustainable Cities	Dr. Lluís Ribas	**lluis.ribas@uab.cat** **+34 93 581 1078**
Data Engineering	Dr. Débora Gil	debora.gil@uab.cat **+34 93 581 2301**

2.3.3 Coordinators of Official Master's degrees

The Official Master's Degrees of the School of Engineering provide students with an advanced training aimed both at professional specialization and at introduction to research, offering practical training for employment and others specialising in initiation to research. Our official master's degrees are valid in all of Spain and equivalent to the Master's degrees programmes in Europe. Research-oriented programmes give access to PhD programmes.

Master's Degree	Coordinator	Contact
Aeronautical Management	Dr. Romualdo Moreno	**romualdo.moreno@uab.cat** **+34 93 728 77 38** **coord.master.mga@uab.cat**
Biological and Environmental Engineering	Dr. María Eugenia Suárez-Ojeda	**MariaEugenia.Suarez@uab.cat** **+34 93 586 8372**
Computer Engineering	Dr. Anna Sikora	**anna.sikora@uab.cat** **+34 93 581 3533**
Computer Vision	Dr. Maria Vanrell	**maria.vanrell@uab.cat** **+34 93 581 2415**
Logistics and Supply Chain Management	Dr. Juan José Ramos	**juanjo.ramos@uab.cat** **+34 93 728 7764** **coord.gestio.aeronautica@uab.cat**
Telecommunication Engineering	Dr. Jose Lopez Vicario	**jose.vicario@uab.cat** **+34 93 586 8113**
Internet of Things for e-Health	Dr. Jordi Carrabina	**Jordi.carrabina@uab.cat** **+34 93 581 3082**
Information and Communication Technology Security (UOC)	Dr. Guillermo Navarro	**guillermo.navarro@uab.cat** **+34 93 581 4835**

2.3.4 Coordinators of UAB-specific Master degrees/Graduate diplomas

Aimed at creating professionals sought after by the most innovating economic and social sectors, Masters and Graduate Degrees at the School of Engineering are a major tool to update the knowledge and develop the career of graduated students.

The following Master's degrees and graduate diplomas are specific to the UAB, as set out in the legislation covering postgraduate studies and further education. Their recognition

depends on the institutions or companies to which they are submitted by their holders. In order to guarantee their academic rigour, they are subject to similar quality control processes to those used for official programmes taught at the UAB. It should be kept in mind, however, that this type of qualification, specific to a Spanish university, does not give access to PhD programmes in Spain.

Professors, professionals and external institutions take part in graduate teaching to make sure that courses takes into account the most recent practical approaches that the labour market urgently demands.

UAB-specific Master degree/Graduate diploma	Coordinator	Contact
Master's Degree in Engineering in Mobile Device Applications	Dr. Enric Martí	**enric.marti@uab.cat** **+34 93 581 1501**
Graduate Diploma in Big Data Processing for Life Sciences	Dr. Dolores Isabel Rexachs del Rosario	**dolores.rexachs@uab.cat** **+34 93 581 3535**

2.3.5 Coordinators of Official PhD programmes

The UAB has 4 PhD programmes regulated by Royal Decree 99/2011, on PhDs categorised in the **Technological Sciences** area of interest, which are being conducted by academic personnel of the Engineering School. If you are interested in joining one of our PhD programmes or would like further information, please contact the relevant programme "Contact" details, together with other general information found in the links.

In the links of the following table, at each programme's website, prospective PhD students find general information on the programme: career options, admissions procedure and calendar, lines of research, thesis supervisors, activities, monitoring, enrolment and quality.

PhD Program	Coordinator	Contact
Biotechnology	Dr. Francesc Gòdia	**francesc.godia@uab.cat** **+34 93 581 4790** **d.eng.quimica@uab.cat**
Computer Science	Dr. Jordi Gonzàlez	**jordi.gonzalez@uab.cat** **+34 93 581 1519** **uisad.informatica@uab.cat**
Electrical and Telecommunication Engineering	Dr. Gary Junkin	**Gary.junkin@uab.cat** **+34 93 586 4733** **d.telecos.eng.sistemes@uab.cat**
Environmental Science and Technology	Dr. Montserrat Sarrà	**montserrat.sarra@uab.cat** **+34 93 581 2789** **doctorat.icta@uab.cat**

2.4 Departments

The UAB departments are units in charge of organising and developing the activities of teaching. Teaching staff is attached to departments, where they are responsible for teaching the course subjects and organising research in research groups. Each department corresponds to a field of knowledge and is divided into even more specific areas.

The UAB has over sixty departments which cover all disciplines of knowledge, 7 of them corresponding to the Experimental and Technological Sciences field of research and located at the School of Engineering:

1. Dept of Chemical, Biological and Environmental Engineering
2. Dept of Computer Architecture and Operating Systems
3. Dept of Computer Science
4. Dept of Electronics Engineering
5. Dept of Information and Communications Engineering
6. Dept of Microelectronics and Electronic Systems
7. Dept of Telecommunications and Systems Engineering

Research at the School of Engineering is also carried out through the departments, research groups, or research centres, either in consortia with the UAB or with the Spanish National Research Council (CSIC) with the headquarters on the UAB campus, described in Chapter 4.

The next Table lists the number and categories of professors per department (December 2017):

| | | Number of professors | | | | | | | | | | | | | | | | |
| | Category (in Catalan) | CU | | CEU | | TU | | TEU | | Agregat | | Associat | | Emèrit | | Contractats doctors | | Total |
Departament UAB	Sex	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	Total
469	Departament d'Arquitectura de Computadors i Sistemes Operatius	1	2	0	0	2	6	0	0	1	1	2	10	0	1	0	0	26
472	Departament d'Enginyeria de la Informació i de les Comunicacions	0	1	0	1	1	5	0	1	1	5	2	9	0	0	0	0	26
463	Departament d'Enginyeria Electrònica	2	3	0	0	2	5	0	0	0	5	0	7	0	0	0	1	25
2634	Departament d'Enginyeria Química, Biològica i Ambiental	0	3	0	0	5	4	0	0	4	10	8	16	0	1	0	0	51
471	Departament de Ciències de la Computació	0	0	0	0	1	12	0	0	3	5	2	6	0	1	1	1	32
470	Departament de Microelectrònica i Sistemes Electrònics	1	2	0	0	2	6	0	0	0	0	2	8	0	0	0	0	21
461	Departament de Telecomunicació i Enginyeria de Sistemes	0	1	0	0	1	6	0	0	2	7	2	6	0	0	0	0	25
Total		4	12	0	1	14	44	0	1	11	33	18	62	0	3	1	2	206

Teaching at the School of Engineering involves personnel from 17 different Departments, seven of which are from the School (Information Engineering and Communications, Computer Science, Microelectronics and Electronic Systems, Computer architecture and Operating Systems, Electronic, Telecommunications and Systems Engineering and Chemical Engineering). In addition to these, other departments such as Mathematics, Physics, or Business, at a greater or lesser extent, are involved in teaching.

The next Tables list the professor participation data in Grades and Masters at the School of Engineering during the academic year 2018-19, either from such Departments, and external. The final numbers can be found here (NIU/PWD required):

https://tpd.uab.cat/tpd/centre/show/115?anyAcademicActual=2018

Departments involved in teaching at the School of Engineering, participation ratios in Grades, 2018-19

Department	Number of full-time professors (number hours / 420) % teaching hours in each Grade								
	GEST	GEET	GEI	GED	GEI+GEET	GEI+GEST	GEQ	GGA	GCIS
Computer Architecture and Operating Systems	0,07 2,63%	0,09 3,17%	9,38 19,15%	0,46 23,47%	0,63 17,36%	0,48 10,04%			
Computer Science	0,01 0,38%		15,18 31,00%	0,52 26,53%	0,57 15,70%	0,64 13,39%		1,28 10,58%	0,35 6,47%
Information and Communications Engineering	0,22 8,27%	0,04 1,41%	10,73 21,91%	0,03 1,53%	0,56 15,43%	0,94 19,67%		0,46 3,80%	0,25 4,62%
Electronic Engineering	0,23 8,65%	1,83 64,44%	2,91 5,94%		0,63 17,36%	0,55 11,51%			0,81 14,97%
Chemical, Biological and Environmental Engineering							14,17 69,49%		0,42 7,76%
Microelectronics and Electronic Systems	0,02 0,75%	0,34 11,97%	3,46 7,07%	0,46 23,47%	0,32 8,82%	0,21 4,39%	0,46 2,26%	0,91 7,52%	0,61 11,28%
Telecommunications and Systems Engineering	2,1 78,95%	0,53 18,66%			0,41 11,29%	1,33 27,82%		3,22 26,61%	0,95 17,56%
Mathematics			4,46 9,11%	0,49 25,00%	0,27 7,44%	0,34 7,11%	1,9 9,32%	2,12 17,52%	
Physics					0,14 3,86%	0,16 3,35%	1,25 6,13%		
Business	0,01 0,38%	0,01 0,35%	2,03 4,15%		0,1 2,75%	0,1 2,09%	0,36 1,77%	1,99 16,45%	0,19 3,51%
Geography									1,83 33,83%
English and German			0,44 0,90%						
Political Science and Public Law			0,38 0,78%			0,03 0,63%			
Chemistry							2,25 11,03%		
Applied Economics								1,05 8,68%	
Private Law								0,61 5,04%	
Social Psychology								0,41 3,39%	
Sociology								0,05 0,41%	

Departments involved in teaching at the School of Engineering, participation ratios in Masters degrees, 2018-19

Department	Number of full-time professors (number hours / 420) % teaching hours in each Master					
	MULCS	MUET	MUIOT	MUVC	MUEBA	MUGA
Computer Architecture and Operating Systems			0,32 24,24%	0,01 5,26%		
Computer Science			0,36 27,27%	0,18 94,74%		
Information and Communications Engineering		0,19 9,79%	0,26 19,70%			
Electronic Engineering		0,51 26,29%				
Chemical, Biological and Environmental Engineering					3,08 99,35%	
Microelectronics and Electronic Systems		0,38 19,59%	0,34 25,76%			
Telecommunications and Systems Engineering	0,7 100%	0,86 44,33%				0,81 62,79%
Business						0,17 13,18%
Chemistry					0,02 0,65%	
Private Law						0,2 15,50%
Social Psychology						0,11 8,53%
Nursing			0,04 3,03%			

Next, we detail the basic indicators of the 7 departments of the School of Engineering, also in terms of their attached research groups which are listed in Chapter 4.

2.4.1 Dept. of Chemical, Biological and Environmental Engineering

DIRECTOR: Dr. Francisco Valero

ADDRESS: Block Q – UAB Campus, 08193 BELLATERRA (Barcelona)

TELEPHONE: 34 93 581 1018

FAX: 34 93 581 2013

E-MAIL: d.eng.quimica.biologica.ambiental@uab.cat

WEB: http://bit.ly/DEQBA

RESEARCH LINES:

- **Biodegradation of industrial pollutants and waste valorization**

- **Composting of solid organic waste**

- **Cell and tissue engineering**

- **Bioprocess Engineering and Applied Biocatalysis**

- **Sustainability and environmental prevention**

- **Biological Treatment and Valorisation of Liquid and Gaseous Effluents**

ATTACHED RESEARCH GROUPS:

4.1.5. Biodegradation of Industrial Pollutants and Waste Valorization

4.1.6. Biological Treatment and Valorisation of Liquid and Gaseous Effluents

4.1.8. Bioprocess Engineering and Applied Biocatalysis

4.1.9. Cell and Bioprocess Engineering

4.1.15. Composting of Solid Organic Waste

4.1.34. Sustainability and Environmental Prevention

2.4.2 Dept. of Computer Architecture and Operating Systems

DIRECTOR: Dr. Miquel Àngel Senar Rosell

ADDRESS: Block Q – UAB Campus, 08193 BELLATERRA (Barcelona)

TELEPHONE: 34 93 581 1990

FAX: 34 93 581 2478

E-MAIL: d.arquitectura.computadors@uab.cat

WEB: http://www.uab.es/dep-arquitectura-computadors-sistemes-operatius/

RESEARCH LINES:

- **Parallel applications in computational science**
    - Simulations and behaviour models orientated to the individual
    - Simulation of fire propagation. Risk environment models.
    - Advanced multimedia systems design (Vídeo Under Demand)
    - Evaluations and prediction of cluster performance and efficient resource management in multiclusters

- **Parallel computer archtiectures**
    - Interconnection networks
    - Configuration and evaluation of archtecture for high performance computer systems: computing and storage resources

- **Tools and strategies for the anagement and use of distributed systems**
    - Resource management in Grid environments and non-dedicated clusters
    - Availability: failure tolerance support

- **Environments for evaluating performance and tuning of applications in parallel and distributed systems**
    - performance and efficiency: support tools for performance tuning
    - Tools for predicting performance

- **Load-balancing policies in parallel systems**
    - Load-balancing policies in parallel systems

ATTACHED RESEARCH GROUPS:

4.1.19. High Performance Computing Applications for Science and Engineering

4.1.20. High Performance Computing for Efficient Applications and Simulation

2.4.3 Dept. of Computer Science

DIRECTOR: Dr. Ernest Valveny

ADDRESS: Block Q – UAB Campus, 08193 BELLATERRA (Barcelona)

TELEPHONE: 34 93 581 3015

E-MAIL: d.ciencies.computacio@uab.cat

WEB: http://dcc.uab.es/

RESEARCH LINES:

- **Computer vision**
    - Document analysis
    - Analysis of medical images
    - Colour and texture
    - Driver Assistance Systems

- **Video image analysis**
    - Human behaviour recognition
    - High performance computer systems

- **Computer graphics and scientific visualisation**
    - Immersive systems
    - Programming with GPU

ATTACHED RESEARCH GROUPS:

4.1.1. Advanced Driver Assistance Systems (ADAS)

4.1.13. Color in context (CIC)

4.1.18. Document Analysis (DAG)

4.1.21. Image Social Evaluation (ISE Lab)

4.1.23. Interactive and Augmented Modelling (IAM)

4.1.25. Machine Vision (MV)

4.1.29. NeuroComputation and Biological Vision Team (NeuroBiT)

Almost all Computer Science Department personnel are also researchers at the Computer Vision Center. See section about the CVC to get more information about projects and publications of this Department staff.

2.4.4 Dept. of Electronics Engineering

DIRECTOR: Prof. Ferran Martín

ADDRESS: Block Q – UAB Campus, 08193 BELLATERRA (Barcelona)

TELEPHONE: +34 93 581 3183

FAX: +34 93 581 2600

E-MAIL: d.eng.electronica@uab.cat

WEB: http://www.uab.cat/departament/enginyeria-electronica/

RESEARCH LINES/GROUPS:

4.1.3. Aplicacions Electro-Mecàniques Industrials

4.1.10. Circuits and electronic systems

4.1.16. Computational nanoelectronics (nanocomp)

4.1.26. Microwave, metamaterials and antenna engineering group (gemma/cimitec)

4.1.28. Nano-optoelectromechanical systems for energy laboratory nanerg lab

4.1.30. Reliability of electron devices and circuits (redec)

2.4.5 Dept. of Information and Communications Engineering

DIRECTOR: Dr. Joan Serra Sagristà

ADDRESS: School of Engineering, UAB, Cerdanyola del Vallès, 08193 Barcelona

TELEPHONE: +34 93 581 18 61

E-MAIL: d.eng.informacio.comunicacions@uab.cat

WEB: http://www.uab.cat/deic/

RESEARCH LINES:

- **Combinatorics, coding and security.** This is a traditional line of research in the department. The aim of this line is the study, construction and classification of codes for the detection and corrections of error in digital transmission systems. Currently the line is centred on the study of new families of non-linear binary codes, especially completely regular codes, 1-corrector perfect codes, Z2Z4-linear codes, Hadamard codes,...

- **Source Coding / Data Compression.** The Group on Interactive Coding of Images (GICI) focuses on the study, design and implementation of data coding and transmission techniques and standards. GICI collaborates with other national and international research groups and is open to new collaborations with other researchers.

- **Security in Networks and Distributed Applications.** The Department has several research lines around the security of different types of networks and of different application domains. They include the research of practical solutions to provide security and privacy protection to opportunistic networks (such as Delay and Disruption Tolerant Networking (DTN)) and the use of distributed authorisation schemes and cryptocurrencies (such as Bitcoins).

RESEARCH GROUPS:

4.1.12. Coding, Compression and Security (CCS, Recognized Consolidated Group)

4.1.14. Combinatorics, Coding and Security Group (CCSG)

4.1.24. Interactive Coding of Images (GICI)

4.1.31. Security of Networks and Distributed Applications (SeNDA)

2.4.6 Dept. of Microelectronics and Electronic Systems

DIRECTOR: Dr. Marta Prim Sabrià

ADDRESS: Block Q – UAB Campus, 08193 BELLATERRA (Barcelona)

TELEPHONE: +34 93 581 1470

FAX: +34 93 581 3033

E-MAIL: d.microelectronica@uab.cat

WEB: http://www.uab.cat/departament/microelectronica-sistemes-electronics/

RESEARCH LINES:

- **Micro-Nano technologies for biomedical applications**
    - Technologies, devices and systems for brain health and mental health
    - Micro-Nano-Bio systems and technologies, Biomedical systems for monitoring
    - Ambient Assisted Living, Technologies for increasing personal autonomy
- **Integrated Circuits and Systems Design**
    - System-on-Chip and data processing implementation
    - Modelling and simulation of heterogeneous systems, IoT HW development
    - Energy harvesting and power management.
    - Industrial, Automotive Robotics & Aerospace applications
- **Embedded Computing in HW/SW Platforms and Systems**
    - Embedded High Performance Computing (eHPC), Reconfigurable FPGA systems
    - Multimedia and Mobile Technologies, Printed and Flexible Electronics, IoT
- **Distributed Embedded Systems**
    - Embedded systems, Multi-agent systems, multi-robot systems
    - System design methods and tools
    - Mobile robot applications, Assistive technologies

ATTACHED RESEARCH GROUPS:

4.1.7. Biomedical Applications

4.1.19. Embedded Computing in HW/SW Platforms Laboratory

4.1.22. Integrated Systems and Circuits Design

4.1.33. Software-Hardware Agent-Based Distributed Embedded Systems

2.4.7 Dept. of Telecommunications and Systems Engineering

DIRECTOR: Dr. Maria Ángeles Vázquez Castro

ADDRESS: Block Q – UAB Campus, 08193 BELLATERRA (Barcelona)

TELEPHONE: +34 93 581 4030

FAX: +34 93 581 4031

E-MAIL: d.telecos.eng.sistemes@uab.cat

WEB: http://tes.uab.es

RESEARCH LINES:

- **Antennas and Microwave Systems**
- **Applied Communications Theory**
- **Modelling and Simulation of Logical Systems**
- **Automation and Advanced Control Systems**

ATTACHED RESEARCH GROUPS:

4.1.2. Antennas and Microwave Systems

4.1.4. Automation and Advanced Control Systems

4.1.11. Coding and Information Network

4.1.27. Modelling and Simulation of Logistical Systems

4.1.32. Signal Processing for Communications and Navigation

4.1.35. Wireless Information Networking

2.5 The Personnel of Administration and Services (PAS)

The administrative tasks and organization of services are handled by Direction, composed by the Director Daniel Franco Puntes and his secretary Encarna Rivallo Murillo, and the Administration Centre, coordinated by the School Administrators.

These Administrators, Antoni Montes Roldán and his secretary Àngel Rodriguez Torrubiano in Bellaterra, and Francisco Quesada Martos and his secretaries Glòria Gordillo Franco and Rosa Maria Balada Pericas in Sabadell, are the responsible persons for the management of University services and premises, the administrative/service staff and the budget management in the School that has been delegated to management by UAB.

The Administrators coordinate the Administration Centre, broken down in these areas:

- **Academic Management and Logistic Support**: under the responsibility of the Academic Managers, Carme Nebrera Navas in Bellaterra, and Francisco Quesada (academic management) and Anna Villanueva Lázaro (logistic support) in Sabadell, this structure provides basic services and administrative support centre (student enrolments, issuing official titles, booking classrooms, ...), for the successful development of teaching and research in engineering. In addition, Alex Lopez Español is since 2018 the Quality Manager of the School. The rest of the staff are:
  - Bellaterra:
    - Academic management and Logistic support: Nacho Beneite Díaz, Maria Dolores Caballero Romero, María Carme Carceller Pérez, M.Carmen Cosano Garcia, Olga García Antón, Antonio González Mateos, Carme González Silva, Eduardo Martínez Martínez, Montse Molina Santoro, José Augusto Morillas González, Lluís Trulls Pararols.
  - Sabadell:
    - Academic management: Raul Calejo Méndez, Josep Maria Campuzano Puntí, Eva Ejarque Sabaté, Francisco Manuel González Caballero, Mari Izquierdo Horrillo, and Isabel Rodríguez Fernández.
    - Logistic support: Maria del Carme Capel Romera, Meritxell Concha León, Loli Fernández Diaz, Ivan García Corral and Francisca Zafra Gómez.
  Contact: ga.enginyeria@uab.cat, slipi.enginyeria@uab.cat, slipi.sabadell@uab.cat

- **Financial Management**: Carmen López Soria and Javier Anglès Moliner in Bellaterra and Núria Alier Jané in Sabadell are responsible of the registration and maintenance of the providers, purchasing goods and services, the distribution of the budget to the departments, the payments to suppliers, the refund of tickets and invoices, and the reports of the budget. The rest of the staff are:
  - Bellaterra: María Jose Cepero Lahoz, Inmaculada Mañas Segura, Raquel Vidal Justicia
  - Sabadell: Carina Clavell Fuentez
  Contact: ge.enginyeria@uab.cat, ge.sabadell@uab.cat

- **Integrated Units for the Administration and Support of the Departments**: the persons in these units help the Departments in their everyday activities, like the recruitment of research students and non-permanent teaching personnel, postal services, certificates of teaching services, permission absences, PhD bureaucratic management, payment processes, etc. These Units are:

- **Computer Engineering:** coordinated by Antonio M. Guerra Román the rest of the staff is Domingo Rivodigo Rojas, it comprises the Departments of Computer Architecture and Operating Systems (Gemma Roque Costas and Daniel Ruiz Molina), Computer Science (Encarna Talavera Corbalan and Jorge Ramírez Espejo), Information and Communications Engineering (Raquel Cánovas Priego and Adrià Sánchez Carmona), and Microelectronics and Electronic Systems (Inma Requena Marcos, and Jordi Guerrero Zapata).
- **Telecommunications and Systems Engineering**: coordinated by Jordi Jovani Aubanell, the rest of the staff are, Nuria Serra Galceran, Mar Payerols Santamaria, and Ernesto Díaz Prieto.
- **Electronics Engineering**: coordinated by Marta Mora Miguel, the rest of the staff are Antonia Doroteo Muñoz, Benjamín Lázaro Miranda, Javier Gutierrez Perez and Javier Hellín Navarro.
- **Chemical, Biological and Environmental Engineering**: coordinated by Montserrat Martínez Quesada, the rest of the staff are Laura Alonso Medina, Maria Jose Cobo Valverde, Rosa Maria Fuentes Garcia, Alba Martínez Garcia, , Rosario Tello Tello, and Manuel Plaza Rivero.
- **Sabadell Campus**: coordinated by Gloria Gordillo Franco, the rest of the staff are Rosa María Balada Pericas, Silvia Melgarejo Pérez., Margarita Torres Cáceres.

- **Computer and Networks Support**: Jose Antonio Lorenzo Ajo in Bellaterra and Juan Jose Rodriguez Guerra in Sabadell are in charge of coordinating the management of HW equipment (at classrooms, research/teaching laboratories and departments), the open-source/licensed SW used by the academic personnel, and security/privacy issues when accessing the different networks. The rest of the staff are:
  - Bellaterra: Antonio Aguilar Sanchez, Pere Cerdan Martinez, Juan Carlos Lao Carretero, José Carlos López Perez, Ricardo Roda Bravo.
  Contact: siee@uab.cat, sid.sabadell@uab.cat

- **Library of Science and Technology**: in Bellaterra, the Library is located at Building C and managed by Montserrat Mallorquí Graupera, while in Sabadell is managed by Pilar Ginés Mateo, who are in charge of managing the library collection: new book acquisitions, maintaining the open-access of specialized journals, book reservations, etc. The rest of the staff in Sabadell are:
  - Maria Virtudes Guzmán Aguilar, Juan Antonio Muñoz González, Irina Olives Piris, José Manuel Salinas Rodríguez, Roberto David Sánchez Mandressi, Salvador Sedeño López, Elena Segura Martínez
  Contact: bib.ciencia.tecnologia@uab.cat, bib.sabadell@uab.cat

2.6 The Student Council

The Student Council at the School of Engineering is the body of participation, coordination and decision of the students of the School, and also the intermediary of the students with the UAB and School of Engineering institutions. The main objective of the Student Council is to safeguard the rights and interests of the students, to direct their proposals, complaints and demands to the competent and decision-making bodies of the School, and to promote and to facilitate that the students receive an academic training with the highest academic and human quality.

- E-mail : consell.estudiants.enginyeria@uab.cat

- Facebook: https://www.facebook.com/coenginyuab

- Twitter: https://twitter.com/coenginyuab

- Instagram: http://www.instagram.com/coenginyuab/

- Blog: http://www.enginyeriauab.cat/

3. Academic Degrees

The courses taught in the School of Engineering are of four types:

- Engineering Bachelor's Degrees: The bachelor's degrees at the School of Engineering provide students with a large amount of practical and technical experience, helping them to be better prepared as they enter the professional engineering world.

- Official and UAB-specific Master degrees and graduate diplomas: Master's degrees and graduate diplomas at the School of Engineering are a major tool to update your knowledge and develop your career.

- PhD programs in technological sciences: The School of Engineering is a first-class research incubator, whose researchers are involved in 4 PhD programmes, 3 of these having received the Spanish Doctorate Excellence Award.

- The Massive Open Online Courses (MOOC) at *Coursera*: The School of Engineering entered the MOOC world seeking for consistency with its strategic plan, i.e. to transfer scientific, technological, cultural and educational knowledge through quality teaching, as well as a clear international vision.

3.1 Engineering Bachelor's Degrees

From the academic year 2010-11 on, the School of Engineering started 5 official graduate studies in accordance with the European Higher Education Area (EHEA). These technological degrees, all of 240 ECTS (4 years), taught at the School of Engineering are:

- Computer Engineering,
- Chemical Engineering,
- Electronic Engineering for Telecommunication,
- Telecommunication Systems Engineering, and
- Aeronautical Management.

In addition, this academic year 2018-19, the School of Engineering offers the official Bachelor Degrees in:

- Management of Smart and Sustainable Cities, of 180 ECTS (3 years), and
- Data Engineering, of 240 ECTS (4 years).

On the other hand, the School of Engineering offers 2 double degrees of 327 ECTS (5 years). Students taking these double degrees do not only learn about the subject areas of each degree independently but also receive an interdisciplinary training that will help them to meet the professional challenges of ICT and to attain a versatility that will put them at an advantage with respect to other professionals in the sector. These technological double degrees are:

- Computer Engineering (Specialisation in Computer Engineering) + Bachelor's Degree in Telecommunication Electronic Engineering; and
- Computer Engineering (Specialisation in Information Technologies) + Bachelor's Degree in Telecommunication Systems Engineering.

3.1.1 Degree in Computer Engineering (GEI)

The objective of the bachelor's degree in Computer Engineering is to train expert professionals in computers with a global vision of technology who are capable of analysing, designing, developing and implementing computer systems for different environments and situations, while also being capable of adapting them to changes and technological innovations.

The UAB provides a generalist training and prepares students in all computer fields, while at the same time offering specialisation in four training profiles within the fields of technology: software engineering, computer engineering, computing and information technologies.

The close relation with advanced technological and research centres of both local and international prestige, and with leading companies from the ICT sector, facilitates student participation in high quality work placements and a successful entry into the labour market. Some affiliated centres located on campus are the Computer Vision Centre, the Artificial Intelligence Research Institute and the National Microelectronics Centre.

The bachelor's degree in Computer Engineering can be taken in combination with the bachelor's degree in Telecommunication Systems Engineering.

Computer engineering is one of the most popular sectors in today's job market. There is no unemployment among graduates of this degree and new job offers are announced every day. This allows you to choose from a wide array of opportunities such as application programmer, web developer, database administrator, systems analyst, program architect, IT consultant, project manager, mobile app developer, community manager, network and systems administrator, SEM/SEO specialist, knowledge engineer, functional analyst, information architect, information system security officer, video game designer, web administrator, etc. You will also be able to choose from other professions which have not been invented yet, but which you will be fully prepared for given your global training which will allow you to adapt to all types of technological changes and innovations.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/computer-engineering-1216708259085.html?param1=1263367146646

3.1.2 Degree in Chemical Engineering (GEQ)

The feature that distinguishes the UAB bachelor's degree in Chemical Engineering is the **projection of chemical engineering knowledge into the fields of bioengineering and technological applications in environmental engineering**. The Department of Chemical Engineering has been a pioneering agent in both these areas.

Through **specialisations** (academic tracks) students in their fourth year can specialise in biochemical or environmental engineering, in materials engineering or in engineering of chemical processes. The UAB has designed these to train up professionals in these areas, which open up **many career opportunities**.

One example of this is the **MELiSSA project** (Micro-Ecological Life Support System Alternative), an innovative laboratory belonging to the European Space Agency, which started as part of a research programme on life support technologies, to test the viability of a long-term, manned space mission, and was launched thanks to an initiative by UAB chemical engineers.

The main career options lie in the emerging bioengineering fields, particularly in environmental biochemistry and engineering, which the Department of Chemical Engineering of the UAB specialises in, as seen in two of the specialisation tracks offered. Graduates tend to work in the following fields: Process engineering in the industries of biotechnology, chemistry, petro-chemistry, pharmaceuticals, food, etc; Process engineering in environmental technologies; Chemical engineer; Director of production; Director and developer of research projects; Research in research projects; Auditing, consulting and assessing; and lecturing.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/chemical-engineering-1216708259085.html?param1=1232003397968

3.1.3 Degree in Electronic Engineering for Telecommunications (GEET)

Starting in the 2016-2017 academic year, Telecommunication Systems Engineering (GEST) and Electronic Engineering for Telecommunications (GEET) are offered together. In the first two years students will follow the same syllabus and, starting in the third year, each one will take the specific subjects belonging to their degree.

The UAB bachelor's degree in Electronic Engineering for Telecommunication will enable you to **work in the regulated profession of telecommunications engineering**, in all of its variables. The ares in which you can immediately enter the labour market after graduating are telephone systems in general, communication via satellite, instrumentation systems and electronic design in general. Telecommunication engineering includes the design, implementation and management of the **systems in charge of sending and receiving any type of information**, through the radiation of electromagnetic waves, light pulse conductivity via fibre optics and acoustic emission.

The bachelor's degree was designed by incorporating modern learning methodologies with the double objective of maximising student performance and favouring their entry into the labour market. The close relation with internationally renowned technological centres and the leading companies of the ICT sector makes it easier for students to participate in **high quality work placements** and later enter the labour market as graduates in telecommunications by the UAB. Professionals are greatly needed in the field of ICT (Information and Communication Technologies), as well as in other sectors that use these types of technologies. Some of the most common career options are: Systems design/integration; Systems consultant; Specialist in ICT solutions; Communications network design; Multimedia Programming; Radio frequency engineer; Telecommunications consultant; Hardware development engineer; Telematic network architect; Information management; Test/Integration specialist; Analysis of telematic services; Digital design; Data communication engineering; Designer of applications for the digital processing of signals; Director of ICT projects; Technology Development and Research.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/electronic-engineering-for-telecommunication-1216708259085.html?param1=1231918841881

3.1.4 Degree in Telecommunication Systems Engineering (GEST)

Starting in the 2016-2017 academic year, Telecommunication Systems Engineering (GEST) and Electronic Engineering for Telecommunications (GEET) are offered together. In the first two years students will follow the same syllabus and, starting in the third year, each one will take the specific subjects belonging to their degree.

Telecommunications Engineering is a **regulated profession with great prestige** and **high demand on the part of employers**, combining disciplines like physics and mathematics to solve everyday problems, such as communication at a distance between persons or machines or collecting information from the surroundings through sensors, or to design systems for remote control, telemetry and radio navigation. The bachelor's degree in Telecommunication Systems Engineering **equips professionals to design, deploy and manage wireless telecommunication systems** (such as networks for mobile phones or satellite communication, or for distributing multimedia, remote control and radio navigation signals) and cable communication systems (such as switched digital telephony networks, common telecommunications infrastructures in buildings, optical fibre deployment, etc.).

The close relation with internationally renowned technological centres and the leading companies of the ICT sector makes it easier for students to participate in **high quality work placements** and later enter the labour market as graduates in telecommunications by the UAB. Career options are focused on the design, development, operation and maintenance of telecommunications systems, such as new generation mobile phone networks, optic fibre networks and broadcasting systems (television, radio), satellite communication, as well as georeferencing and radio navigation. The training received opens up a wide array of professional opportunities in sectors such as information and communication technologies (ICTs), internet, transport, logistics, e-commerce, telemedicine, smart cities, aeronautics and space. For those interested in continuing their education, this bacherlor's degree gives direct access to the master's degree in Telecommunication Engineering.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/telecommunication-systems-engineering-1216708259085.html?param1=1231918843232

3.1.5 Degree in Aeronautical Management (GGA)

The Bachelor's Degree in Aeronautical Management offers comprehensive training in the logistics of air transport in which students learns in socioeconomic, legal and logistical issues of importance to the aeronautical sector, and in basic areas of air navigation. This programme trains up experts in IT, aeronautics and mathematics, and also in finance, socio-economic issues and transport operations. There is also an Specialization in Logistics of Air Transport (30 ECTS). In fact, the School of Engineering at UAB was the first in Spain to offer a Degree in Aeronautical Management within the parameters of EHEA.

The demand for air transport among European passengers is expected to double over the next twenty years, which will require professionals in aeronautics management who can guarantee an efficient, accessible, safe and sustainable air transport system. This has led to a notably high growth in the aeronautics sector both on a European and a worldwide scale.

The needs of this sector are reflected in the employment rates of current graduates, which are very high, and the fact that the sector provides grant funding for final year students on work placements. These professionals are able to work in the following areas:

- Commercial planning in the air transport and airport sectors;
- Air transport economics;
- Market research in air and multimode transport;
- Planning, organisation and management of airlines;
- Models of demand for air transport (passengers and cargo) in the short, medium and long term; and
- Strategic, tactical, logistic and operational planning for airports.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/aeronautical-management-1216708259085.html?param1=1228117324495

3.1.6 Degree in Management of Smart and Sustainable Cities (GCIS)

The programme's contents will equip students with the knowledge needed to become professionals in information and communication technologies (ICTs), capable of intelligently solving city management issues in which the population, economy, mobility, environment and administration must be taken into account. All this with the final aim of overcoming the challenges posed in current and future management methods. Challenges such as contamination, security, traffic, transport, rubbish collection, utility services, etc. but also sustainable mobility, accessibility, citizen participation, tourism, etc. must find ways to improve their management through the ICTs.

The programme is structured into four thematic axes which meet the training needed to understand the functioning, management and governing of a city: 1 Urban, Territorial and Environmental Dynamics; 2 Information Processing Systems; 3 Mapping, Geographic Information Systems and Remote Sensing; and 4 Management of Data and Computer Applications. In this degree, students should have an interest in applying technological developments to the management of urban life and aim to work professionally on companies and public administration focusing on aspects such as logistics, transport, utilities (water, energy, waste), commerce, urban planning and other similar fields. Students must be able to follow integrated and cross-curricular studies combining technological and social elements, have an open mind, a collaborative spirit and the ability to innovate.

The management of smart and sustainable cities will provide the training needed to answer the needs of the public administration and businesses in several fields, such as: Engineering and Urban Consultancies; Public Utilities (Water, Gas, Energy, Residues); Mobility and Transport Traffic Consultants; Cultural Management; Community Involvement; Business and Social Economics; Mapping and Geographic Information Services; Environmental Management; Devices and Technologies for Urban Networks; and new companies focused on geographic data services and technological services for urban areas.

Link: http://www.uab.cat/web/estudiar/ehea-degrees/general-information/management-of-smart-and-sustainable-cities-1216708259085.html?param1=1345732097106

General information	Admission Study plan ▾ Teaching staff Quality ▾

📍 School of Engineering	🏷️ **Price per credit:** 39.53 Euros
Bellaterra Campus	💬 **Language:** Catalan (65%), Spanish (30%) and English (5%)
📅 **Duration:** 3 courses - 180 credits	
👥 **Places:** 60	🔔 null
📝 **Admission mark:** 5,000	⚙️ **Learning mode:** Classroom-based learning

50

3.1.7 Degree in Data Engineering (GED)

Millions of bytes of data are generated every day. This increase in the information available affects many institutions and businesses, and data treatment has become an element which facilitates and improves production and decision making processes in two relevant manners: in storage and access, and in the analysis which extracts useful information.

The innovative element of the UAB bachelor's degree in Data Engineering is that it permits covering the whole of the data's life cycle: 1) obtaining and extracting data; 2) mathematical and computational representations; 3) safe transmissions and storage; 4) efficient processing of the information contained; and 5) analysis and visualisation of this information.

Data treatment is a necessary component of many companies and institutions which facilitates and improves their productive and decision-making processes. The degree prepares graduates to be ready to form part of multidisciplinary teams in which they can work with different experts from a variety of fields to design innovative computational solutions with added value, based on the data available in different areas of knowledge.

Upon completing the degree, you will be prepared to work in the public administration, industries, health care institutions, financial entities, consultancies, research centres, etc.

There is an increasing demand for data engineers worlwide as can be seen in professional social networks, in which job offers with the titles of data engineering or big data engineer surpass 10,000 entries.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/data-engineering-1216708259085.html?param1=1345740029761

3.1.8 Double Degree in Computer Engineering (Specialisation in Computer Eng.) + Telecommunication Electronic Engineering

The fast-paced technological evolution and advances in globalisation have made the information and communication technologies (ICTs) present in almost all of our personal and also professional activities. **The union of concepts such as information technology, internet and telecommunications is a reality demanding the knowledge of professionals capable of working in all three areas**. For this reason, the UAB offers a double degree in which students can receive integrated training leading to two diplomas in five years.

Students of the double degree in Computer Engineering (Specialisation in Computer Engineering) + Telecommunication Electronic Engineering will receive training in both the subjects belonging to each degree and **interdisciplinary training to help successfully face the professional challenges of the ICTs** and acquire a highly valued versatility with which to stand out from other professionals in the sector. The close relation with advanced technological and research centres of both local and international prestige, and with leading companies from the ICT sector, facilitates student participation in **high quality work placements** and a successful entry into the labour market.

There is great demand for these types of graduates in ICT and other sectors that make use of these technologies: Management of ICT projects and computer installations; Design and administration of information and communications systems, and complex computer networks; Development of computer applications for different sectors, environments and technologies (web, mobile, etc...); Design of computers and digital devices that integrate hardware, software and communications (mobile devices, home automation, robots or image processing systems); Design and optimisation of high-performance applications (from games to scientific computation); Engineering of communication systems for satellite and mobile communications; Radio frequency engineering; Data communication engineering; Design of positioning systems; Analysis of telematic services; Consultancy on communication infrastructure planning; Consultancy on telecommunications and computer science.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/computer-engineering-telecommunication-electronic-engineering-1216708259085.html?param1=1345654053765

3.1.9 Double Degree in Computer Engineering (Specialisation in Information Tech.) + Telecommunication Systems Engineering

The speed of technological change and the advance of globalisation have brought information and communication technologies (ICT) more and more to the forefront in a large number of both everyday and professional activities. The merging of concepts like computer science, Internet and telecommunications has created a need for professionals with the knowledge to work in all three branches. For this reason we have combined two degrees that are currently in high demand into one five-year course.

On one hand, the degree in Telecommunication Systems Engineering equips professionals to design, deploy and manage wireless telecommunication systems and cable communication systems. It also qualifies its holders to work as officially-recognised technical telecommunication engineers, of all types. On the other hand, the degree in Computer Engineering equips professionals to analyse, design, develop and deploy information systems in a wide range of environments and situations, adapting to changes and technological innovations. In the Information Technologies specialisation students specialise in the design, construction and installation of infrastructures to meet the requirements of organisations, such as web servers and applications, internal networks, computing services and applications, control and security mechanisms, etc.

There is great demand for these types of graduates in ICT and other sectors that make use of these technologies: Management of ICT projects and computer installations; Design and administration of information and communications systems, and complex computer networks; Development of computer applications for different sectors, environments and technologies (web, mobile, etc...); Information, security and network systems, and application development; Security auditing; Engineering of communication systems for satellite and mobile communications; Radio frequency engineering; Design of positioning systems; Architecture of telematic networks; Analysis of telematic services; Consultancy on communication infrastructure planning; Consultancy on telecommunications and computer science; ICT entrepreneurship; and Research and technology.

Link: https://www.uab.cat/web/estudiar/ehea-degrees/general-information/computer-engineering-telecommunication-systems-engineering-1216708259085.html?param1=1345654047869

3.2 Official and UAB-specific Master's degrees and graduate diplomas

Aimed at creating professionals sought after by the most innovating economic and social sectors, Engineering and Technology Masters and Graduate Degrees at the School of Engineering are a major tool to update your knowledge and and develop your career. An investment in your professional career guaranteed by UAB. In accordance with its profile as a cutting-edge university offering high-quality, diverse, multidisciplinary and flexible teaching, the UAB consolidates its offer in master's degrees which include international mobility, with over twenty official and UAB-specific master's degrees.

3.2.1 Official Master's degrees

The UAB has launched a series of official Masters degrees, with standard fees that are adapted to the new European Higher Education Area. The courses offered at the UAB give advanced education that allows academic or professional specialisation or the beginning of a career in research, since these Masters give access to a PhD. These courses carry between 60 and 120 ECTS credits and may be accessed by anyone with an official university degree.

You can find more information on official masters by areas of knowledge in:
http://www.uab.es/servlet/Satellite/studying/official-master-s-degrees/engineering-and-technology-1096480961706.html?param10=1201854658694

The Official Masters Programmes taught at Engineering School are:

- ## **Master in Logistics and Supply Chain Management**

The Master on Logistics and Supply Chain Management is intended to define a suitable academic answer to an identified need of well-educated professionals in a crucial sector for European economy. The master programme has as the main goal the education of professionals able to take decisions in LSCM considering the operational, tactical and strategic aspects in Logistics and Supply Chain Management from an integrated perspective by covering the technological, engineering and business-related subjects.

The LSCM master's degree is targeting all graduates who want to deepen their knowledge in the area of Logistics and Supply Chain Management combined with an international and intercultural orientation and with a particular focus on methodologies and techniques which are able to handle business data, financial data and engineering data in order to find efficient solutions dealing with strategic, tactical and operational questions.

The LSCM master gives response to a need in present economy of well-educated professionals in the logistics and supply chain field by identifying the common ground and foundations required to fit the learning skills and competencies expected by the labour market in this sector. Furthermore, the European dimension of the Master becomes of major relevance since LSCM is essentially the organization and realization of an inter-organizational and, frequently, trans-national flows (of goods, services, and related information). Student and teacher mobility contributes to provide the graduates with this essential trans-national view.

Link: http://www.uab.cat/web/studying/official-master-s-degrees/general-information/logistics-and-supply-chain-management-1096480962610.html?param1=1327413143446

UAB
Universitat Autònoma de Barcelona

Universitat Autònoma de Barcelona > Study Abroad > Graduate > Official master's degrees > Engineering and technology > Logistics and Supply Chain Management (Study guides)

Official Master's Degree in Logistics and Supply Chain Management

| General information | Content | Teaching staff | Admission | Enrolment | Grants | Practicum | Mobility | Master's degree in figures |

Content | Skills | Study guides | Master's dissertation

Study guides

The information currently available corresponds to the subjects offered during the 2015/16 academic year. If you wish to consult the information included in a study guide not found on the list, please visit the Dipòsit Digital de Documents.

42640 - Basics of Logistics and Supply Chain Management ENG

42653 - Decision Making ENG

42649 - Generic Management Skills ENG

42657 - Information Technology ENG

42633 - LSCM European Dimension ENG

- ## **Master in Computer Engineering (discontinued)**

The master's degree in Computer Engineering is focused on training highly qualified professionals who are capable of coordinating and managing projects, products, processes and installations in all areas of computer engineering. The master's degree aims to bring students into contact with cutting edge technology in order to offer intellectual stimulus and provide a flexible professional profile, consistent with the ample spectrum of research and development opportunities within the field of computer science. From an academic viewpoint, the master's degree offers students from the degree in Computer Engineering to continue onto a master's programme.

It is worth highlighting that the UAB holds a leading position in the most prestigious and influential international university rankings. In recent years, this recognition has been favoured by the growing impact of research, the constant improvement of quality in teaching and the ability to attract international talent.

The UAB includes several prestigious research centres such as: the Computer Vision Centre (CVC), the Nanoscience and Nanotechnology Research Institute, the Artificial Intelligence Research Institute (IIIA), the Barcelona Institute of Materials Science (ICMAB), the Barcelona Institute for Microelectronics - National Centre for Microelectronics (IMB-CNM). The UAB also counts with the ALBA Synchrotron facility, located in the vicinity of the campus. All these research centres represent possible career options for graduates of the master's degree who decide to continue onto research. In addition, the master's degree diploma legally qualifies you to work professionally as a computer engineer.

Finally, many national and international reports point out the need for professionals in the field of information technologies. Therefore, the percentage of graduates who go on to enter the labour market is 100%.

Link: http://www.uab.cat/web/studying/official-master-s-degrees/general-information/computer-engineering-1096480962610.html?param1=1345664654383

Official Master's Degree in Computer Engineering

General information	Content	Teaching staff	Enrolment	Grants	Practicum	Mobility	Master's degree in figures

Course coordinator

Anna Bàrbara Sikora
E-mail address: Anna.Sikora@uab.cat

Teaching staff

The master's degree includes lecturers from the four UAB departments dedicated to the computer sciences (Computer Science, Information and Communications Engineering, Computer Architecture and Operating Systems and Microelectronics and Electronic Systems), in addition to lecturers from other departments specialising in issues related to business and project management.

The teaching staff will be complemented with prestigious national and international experts who will be invited to give conferences and courses as part of the programme's modules.

- ## **Master in Telecommunication Engineering**

The master's degree in Telecommunication Engineering is professionally orientated and entitles the holder to practise the profession of Telecommunication Engineer, as established by the Ministry in order number CIN/355/2009 of 9 February (Official State Gazette of 20 February).

Telecommunication engineers practise their profession mainly in the following areas: Management, planning and operation of telecommunication networks and services; design, operation and management of information services (providers of services and applications, internet, intranet); design of telecommunication and positioning equipment; Telecommunication infrastructure, construction or deployment of telecommunication networks (cable, fibre, radio); Electronic engineering; Telematic engineering; Software engineering; Control of systems and processes; Industrial Automation; Production of audiovisual content; Management, planning and operation in areas not specified above (Human Resources, financial management, etc.); Consultancies (technology, strategies, etc.); Teaching and Research.

We recommend that students with qualifications from outside EHEA and who have not yet homologated their qualifications contact the corresponding Professional Association for information on the requirements to work professionally in Spain.

Link: http://www.uab.cat/web/studying/official-master-s-degrees/general-information/x-1096480962610.html?param1=1345648392273

UAB
Universitat Autònoma de Barcelona

Universitat Autònoma de Barcelona > Study Abroad > Graduate > Official master's degrees > Engineering and technology > Telecommunication Engineering (Content)

Official Master's Degree in Telecommunication Engineering

General information	Content	Teaching staff	Admission	Enrolment	Grants	Practicum	Mobility	Master's degree in figures

Content | Skills | Study guides | Master's dissertation

Master description

The syllabus of the Master's **Degree** in **Telecommunication Engineering**, geared towards professional practice, will comprise 90 credits (30 + 30 +30) to be taken over 3 semesters.

During the first academic year (2 semesters), students must take the 60 compulsory ECTS (10 modules), while in the final semester they must take the 18 optional ECTS, and write the master's dissertation, which counts for 12 compulsory ECTS.

- ## **Master in Computer Vision**

This master has been designed to join the research expertise of four Barcelona universities to offer the students an updated programme of methods and foundations of an emerging technology as is computer vision, whose impact is increasing in a wide range of intelligent systems.

Those interested in enrolling in this master's degree can apply for one of the grants offered by the Catalunya-La Pedrera Foundation for graduates enrolling in master's degrees. A total of 5,000 Euros is offered in one enrolment aid. To apply you must have an excellent student record, a Spanish passport and you must enrol in the course full-time.

This master's degree programme attempts to tackle the need for qualified personnel in this field, since computer vision is becoming a fundamental component in multiple systems, such as assisting medical diagnosis and surgery, car driving, quality control and surveillance applications, and improving interfaces for multimedia data access.

The master as a whole is coordinated by the UAB (Universitat Autònoma de Barcelona), and the programme has been designed jointly with UOC (Universitat Oberta de Catalunya), UPC (Universitat Politècnica de Catalunya) and UPF (Universitat Pompeu Fabra). Researchers from all 4 universities participate in this programme.

This master's degree provides skills and expertise that can be used in many fields, allows theoretical knowledge to be quickly applied and produces multidimensional engineering professionals who can work with many systems of various applications, such as image retrieval from content, interpretation and automatic annotation of videos, extracting three-dimensional information from different views and improving the appearance of the image content. It is a technological field that requires highly-trained personnel and is of rapidly increasing scientific interest.

Link: http://www.uab.cat/web/studying/official-master-s-degrees/general-information/computer-vision-1096480962610.html?param1=1345648392514

Universitat Autònoma de Barcelona > Study Abroad > Graduate > Official master's degrees > Engineering and technology > Computer Vision (Skills)

Official Master's Degree in Computer Vision

General information	Content	Teaching staff	Admission	Enrolment	Grants	Practicum	Mobility	Master's degree in figures

Content | Skills | Study guides | Master's dissertation

Ideal student profile

This master's degree is for students interested in **computer vision** technology, for a variety of purposes:

- students who have graduated in any branch of Engineering, Mathematics or Physics, or have an equivalent qualification, and are looking to specialise in order to begin a technology-related career;
- students who are already working in this field and wish to refresh their knowledge;
- students wanting to undertake a PhD thesis in this field.

- ## **Master in Aeronautical Management**

The Master's degree in Aeronautical Management was created to respond to the training needs of those interested in acquiring professional skills in management and focused directly on the aeronautics sector; it also caters to the needs of professionals in this sector interested in the area of management and administration of aeronautics related institutes and companies. The master's degree provides future professionals with the essential skills and abilities needed to carry out several tasks within these companies.

According to the requests that we have received during these last years asking for an on-line version of the master, we developed a project to reach this audience that until now we could not meet. Thus, since the academic year 2014/2015 the Master is offered in a double format: semi-face and virtual (on-line). The latter allows students to follow the master from anywhere in the world, and as easily as if they were physically at the classroom.

Career options stretch across the six main blocks that the sector can be divided into:

- Airports: Executive office; Strategic Planning and Quality Control; Airport Services; Finance and Administration Human Resources and Business
- Airline Companies: Executive office, Presidency and Protocol; Strategic Planning and Alliances; Rationalisation of Investments/Costs, Financial Control and Administration; Human Resources; Production Management; Business and Passenger Service.
- Air Navigation: Executive office; Planning, Financial Control and Management; Organisation and Human Resources.
- Auxiliary Services: General Services and Handling; Maintenance; Simulation; General and sports aviation.
- Consultancy: Aeronautical Sector; Human Resources; Economics and Finance.
- Aircraft Building: Management; Strategic Planning and Sales.

Link: http://www.uab.cat/web/studying/official-master-s-degrees/general-information/aeronautical-management-sabadell-campus-1096480962610.html?param1=1096482866243

- ## **Master in Biological and Environmental Engineering**

The master's degree in Biological and Environmental Engineering, worth 90 ECTS credits, is a master's degree which combines the synergies of two emerging disciplines with a very promising future: Biological Engineering and Environmental Engineering. Both are studied in depth from the point of view of a Chemical Engineer. The overall objective of the master's degree in Biological and Environmental Engineering is to train professionals and researchers who are capable of integrating advanced concepts in chemical engineering into the design of solutions for the research, development and operation of processes using microorganisms and their biological components in the areas of industrial biotechnology and environmental engineering.

Prospective students will acquire the training needed to form part of businesses from the biotechnological and/or environmental sector with the aim of improving the existing services by offering an innovative view with a solid base in chemical engineering. Professionally, you will be capable of designing efficient and sustainable effluent and residue treatment systems, planning and controlling environmental management systems and applying molecular biology and methodological principles which support microorganisms for applications in the biotechnological sector.

Once you complete the master's degree you will be able to work both in the (public and private) research sector and in the industrial production sector in several branches, such as: Industrial biotechnology: environmentally sustainable production of chemical and pharmaceutical products, materials and bioenergy; Food Industries: food biotechnology, fermentative processes, nutriceutical, functional foods, development of new products; Pharmaceutical industry: R&D departments, biologically active products, biotechnological production of drugs; Biomedicine: bioengineering, biomaterials, biomedical research; Agriculture industry: cultivations for industrial productions; The environment: treatment plant facilities, environmental quality control, minimisation of effects on the environment, design and development of environmental restoration techniques, management of environmental quality; and Energy: biofuels, renewable sources, bio-transformations.

Link: http://www.uab.cat/web/studying/official-master-s-degrees/general-information/biological-and-environmental-engineering-1096480962610.html?param1=1345664654271

UAB Universitat Autònoma de Barcelona

Universitat Autònoma de Barcelona > Study > Graduate > Official master's degrees > Engineering and technology > Biological and Environmental Engineering (Calendar)

Official Master's Degree in Biological and Environmental Engineering

| General information | Content | Teaching staff | Admission | Enrolment | Grants | Practicum | Mobility | Master's degree in figures |

Application for admission | Admission requirements | Notice of admission | Pre-enrolment | Calendar

General calendar

From 11 January to 9 October 2019.
Each centre establishes its pre-registration periods within these dates, which may also vary.
Please check the master's degree admission dates in the specific section entitled "Teaching centre's admissions calendar".
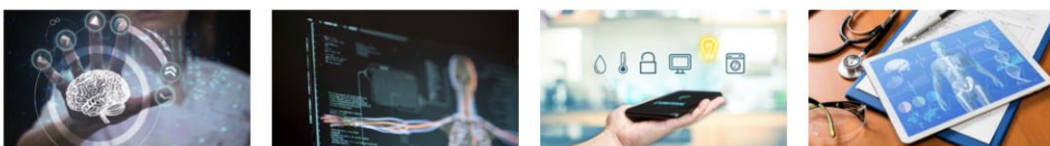
- ## **Master in Internet of Things for e-Health**

The main objective of the **Master's Degree in Internet for Things for eHealth (IoT for eHealth)** is to train qualified professionals with management and leadership skills needed to take efficient decisions, meeting the needs of sector's businesses, administration and users. The master's degree is structured into 4 knowledge domains which segment the different IoT technologies used for eHealth:

- **Wearable Technology**: aimed at monitoring the health and well-being of users; includes everything from implants to applications for athletes.

- **Diagnosis and Intervention Support Systems**: used in the implementation of specialised algorithms for medical environments (e.g. operations, medical imaging, etc.) with their corresponding electronic devices.

- **Distributed Computing:** focused on the analysis, design, implementation and validation of the computing infrastructure distributed in devices, their periphery and cloud, applied to big-data problems in IoT for eHealth and scalable.

- **Information and Security Technologies:** related to the security and integrity of the diverse data from the IoT chain, based on international standards on format and exchange of health data and taking into account the computational and energetic capacities of these implementations.

The master's degree fits the current demand of the professional market and offers a training programme focused on providing the necessary professional skills to work in areas such as the following: Businesses (hospitals, healthcare assistance, insurance companies, etc.) offering healthcare services; Public administration (public health system, healthcare assistance, university); Suppliers of devices, applications and/or technologies for the healthcare sector; Consultancies in engineering and health (including sports); Entities training health professionals in the field of digital health; R&D firms and depts. focusing on IoT for eHealth.

Link: https://www.uab.cat/web/estudiar/official-master-s-degrees/general-information/x-1096480962610.html?param1=1345740335910

UAB Universitat Autònoma de Barcelona

Universitat Autònoma de Barcelona > Study > Graduate > Official master's degrees > Engineering and technology > Internet of Things for e-Health (Application for admission)

Official Master's Degree in Internet of Things for e-Health

| General information | Content | Teaching staff | Admission | Enrolment | Grants | Practicum | Mobility |

Application for admission | Admission requirements | Notice of admission | Pre-enrolment | Calendar

Application for admission to the master's degree

Before beginning the application please check out the **access requirements**, the **required documents** that you will need to scan and the **admissions calendar**.

Your pre-registration will only be considered valid after the **application payment by credit or debit card** and once you have attached all **required documents**.

STEPS TO BE TAKEN TO COMPLETE THE APPLICATION FORM

1- **Click** on the online application form and choose the **master's degree** you are interested in.

- ## **Master in Information and Communication Technology Security**

The Master's Degree in Security of Information and Communication Technologies (MISTIC) provides high-level, academically rigorous training aimed at professionals wishing to specialise ininformation technology security.

There is an ever-increasing demand for both computer engineers and telecommunications engineers who are specifically trained to work in the field of security of information and communication technologies.

On the one hand, electronic transactions are becoming more and more common and the corresponding legislation is being tightened up. On the other hand, businesses are more aware ofsecurity risks and therefore more willing to invest in protection systems.

In response, the Open University of Catalonia, the Universitat Autònoma de Barcelona and the Rovira i Virgili University are offering this inter-university Master's Degree in Security of Information andCommunication Technologies (MISTIC), with the additional participation of the University of the Balearic Islands.

Link: http://www.uab.cat/web/studying/official-master-s-degrees/general-information-1096480962610.html?param1=1330586381920

Inicio / Estudia en la UOC / Másters universitarios / Seguridad de las tecnologías de la información y de las comunicaciones - interuniversitario UOC/ UAB/ URV / Másters universitarios - Universitat Oberta de Catalunya (UOC)

Compartir

Seguridad de las tecnologías de la información y de las comunicaciones - interuniversitario UOC/ UAB/ URV
Máster universitario

> Presentación
> Objetivos, perfiles y competencias
> Salidas profesionales
> Plan de estudios
> Requisitos de acceso y titulación
> Equipo docente
> Itinerario
> Reconocimiento de créditos
> Matrícula y precio

Equipo docente

Profesorado

El equipo docente del máster interuniversitario de Seguridad de las tecnologías de la información y las comunicaciones está formado por profesores y profesoras de la Universitat Oberta de Catalunya, la Universidad Autónoma de Barcelona, la Universidad Rovira i Virgili y la Universidad de las Islas Baleares.

3.2.2 UAB-Specific Master's degrees and Graduate Diplomas

These Master's degrees and graduate diplomas are specific to the UAB, as set out in the legislation covering postgraduate studies and further education. Their recognition depends on the institutions or companies to which they are submitted by their holders. In order to guarantee their academic rigour, they are subject to similar quality control processes to those used for official programmes taught at the UAB. It should be kept in mind, however, that this type of qualification, specific to a Spanish university, does not give access to PhD programmes in Spain. Professors, professionals and external institutions take part in graduate teaching to make sure that courses offer the practical approach that the labour market demands.

You can find more information on UAB-specific Masters degrees and Graduates Diplomas in:
http://www.uab.cat/web/study-abroad/graduate/uab-master-s-degrees-and-graduate-diplomas/all-masters-and-graduate-diplomas-1345670262014.html

The UAB-Specific Master's degrees and Graduate Diplomas are:

- ## **Master's Degree in Engineering in Mobile Device Applications**

This programme trains its students to use the necessary tools and methods for conceiving, planning and carrying out the functional design of mobile device applications. It covers the main mobile platforms that currently lead the market: Android, iOS and Windows Mobile Phone.

The course mirrors real workplace development of mobile applications by organising work in groups of two or three persons. As the course progresses, these groups design their final project, while working individually to learn about the technology of each platform. When the teaching modules are completed, students will be given tutorials to help them with their final project.

This master's degree replaces the 45-ECTS Graduate Diploma in Engineering for Developing Mobile Device Applications, taught over the last five years. It includes and updates the content of the graduate diploma modules and adds two more (one of nine ECTS credits and one of six), to reach the total of 60 ECTS credits.

The target student profile for this master's degree is that of a graduate in the field of technology, interested in science and technology transfer, and seeking to apply their knowledge in a business environment, either in R&D departments or by creating their own technology-based company.

The Career opportunities are: Programmer in companies working in mobile application development; R&D departments in companies; and Technology startups.

Link:http://www.uab.cat/web/postgraduate/master-in-engineering-in-mobile-device-applications/general-information-1217916968009.html/param1-3814_en/param2-2006/

Universitat Autònoma de Barcelona > Study > Graduate > UAB master's degrees and graduate diplomas > Engineering and Technology > Master's Degree in Engineering in Mobile Device Applications (Enrolment)

Master's Degree in Engineering in Mobile Device Applications

| General information | Teaching staff | Admission | Enrolment | Prices, grants and financial aid | Internships | |

Enrolment | Student card

Enrolment

Enrolment formalizes your entrance into the programme and entitles you to obtain the corresponding title or certificate given that you successfully pass it. To avoid any surprises with the required documents, we advise you to enrol on the first days of the provided period.

Enrolment dates

from 05/04/2019 to 22/09/2019

- ## **Graduate Diploma in Big Data Processing for Life Sciences**

These are the times of Big Data, in which different technologies produce thousands of terabytes of data every minute. In the life sciences, this information is important in the areas of health and agrofood. By processing these huge volumes of data together it is possible to generate new knowledge to help us better understand diseases, identify new therapeutic pathways and accelerate the translation of new discoveries to use in patient care, thus advancing towards personalised medicine and a more efficient healthcare system.

Generating new knowledge and technologies from Big Data is a process that consists of several stages. Although we tend to focus our attention on the data analysis phase, the other stages are also important: extraction, integration, visualisation or modelling. Some factors that need to be taken into account in this complex process are heterogeneity, scalability, response times and data protection. In order to improve our understanding of systems and our decision-making in the life sciences it is important to train up professionals who are familiar with the new strategies, methodologies and tools for processing and analysing data. Big Data is the name given to the data sets, procedures and software that, due to their volume, varied nature and the speed at which they need to be processed, are beyond the capacity of ordinary information systems.

Big Data is giving rise to new advances in technology and is allowing production costs to be lowered. The real value of the data lies in the new information and knowledge that can be extracted from it. This is of great relevance to the life sciences, as large amounts of data are being produced and stored that can lead to advances in fields such as personalised medicine or the -omic sciences (genomics, transcriptomics, proteomics, metabolomics, etc.), new systems for classifying pathologies, and new methods and models to improve home telecare and the monitoring of dependent persons who are receiving pharmacological treatment. The processing all this data must be done by interdisciplinary teams of professionals from different areas of knowledge.

Link: http://www.uab.cat/web/postgraduate/graduate-diploma-in-big-data-processing-for-life-sciences/general-information-1217916968009.html/param1-3695_en/param2-2006/

Universitat Autònoma de Barcelona > Study Abroad > Graduate > UAB master's degrees and graduate diplomas > Engineering and Technology > Graduate Diploma in Big Data Processing for Life Sciences (Teaching staff)

Graduate Diploma in Big Data Processing for Life Sciences

General information	Content	Teaching staff	Admission	Enrolment	Prices, grants and financial aid	Internships

Coordinators

Dolores Isabel Rexachs del Rosario

Ana Ripoll Aracil

Teaching staff

Jordi Aguilo Llobet

3.3. Doctorate Programs at the School of Engineering

The UAB has over 65 PhD programmes regulated by Royal Decree 99/2011, on PhD studies, and these are categorised in 5 areas of interest: Arts and Humanities, Sciences, Social and Juridical Sciences, Health Sciences and Engineering/Technological Sciences.

Within the field of Engineering and Technological Sciences, there are 4 PhD Programmes that are mainly coordinated by researchers of the School of Engineering at UAB, namely Electrical and Telecommunication Engineering, Computer Science, Environmental Science and Technology, and Biotechnology.

3.3.1 PhD in Electrical and Telecommunication Engineering

The PhD programme in Electronic and Telecommunication Engineering of the Universitat Autònoma de Barcelona aims to train its students to conduct research on their chosen topic. It promotes the development and innovation that are needed to make significant advances in our scientific and technological understanding, of electronic and telecommunication systems in the wider sense: from the conception, design, production and testing of micro-nano devices, antennas and microwave systems, to the R&D of related applications.

This wide range of activities involves both ground-breaking knowledge and interdisciplinary research, in which these systems and technologies form the basic nucleus of development. Some clear examples of this are micro-nano-biosystems, devices used in the space industry, signal processing and the design of telecommunication networks. Furthermore, as a PhD programme in an engineering school, the application of results from basic research is in itself a final objective. Graphene, carbon nanotubes, multi-micro sensors and actuators, embedded systems, microtechnologies, micro-nano-biosystems, nanoelectronics, robotics, neurotechnology, signal processing, information theory, etc. are some of the most important areas of leading-edge science and technology that this PhD programme deals with. Implementing, maturing and using these technologies and systems in combination gives rise to a great number of applications that directly or indirectly further knowledge, technological progress, innovation, and, ultimately, social well-being.

Departments at the School of Engineering involved: Electronic Engineering; Microelectronics and Electronic Systems; and Telecommunications and Systems Engineering. Collaborating institutions: Institut de Microelectrònica de Barcelona-Centre Nacional de Microelectrònica (IMB-CNM) del CSIC; Centre d'Investigació Biomèdica en Xarxa en Bioinginyeria, Biomaterials i Nanomedicina, CIBER-BBN del ISCIII; Institut d'Estudis Espacials de Catalunya, IEEC del CERCA; and Centre d'Accesibilitat i Intel·ligència Ambiental (CAIAC) de la UAB.

Link: http://www.uab.cat/web/postgraduate/phds/all-phd-programmes/general-information/electrical-and-telecommunication-engineering-1345467765430.html?param2=1345662165161

Universitat Autònoma de Barcelona > Study Abroad > All PhD programmes > Technological Sciences > PhD in Electrical and Telecommunication Engineering (Quality)

PhD in Electrical and Telecommunication Engineering

| General information | Research and supervision | Activities | Review | Admission | Registration | After registration | Quality |

Quality

The UAB is home to a teaching staff of 3,615 who are responsible for the academic training of more than 45,000 students. The university provides **quality teaching and research** in the fields of social sciences, the humanities, experimental sciences, biosciences, health sciences, and engineering and technology.

UAB is internationally recognized for the quality and innovative character of its research and for its role as the coordinating center of a major science and technology hub: the UAB Sphere. This knowledge-generating and transferring activity is made evident by its quality programmes: **27 UAB PhD programmes** of Royal Decree 1393/2007 were **awarded the Excellence Award** from the Ministry of Education.

For all this, UAB leads the university rankings of reference worldwide. It is the **first university in Spain and the 146 best in the world** according to the Times Higher Education Ranking 2015-2016 and one of the best 200 in the world according th the QS Ranking 2015-2016. The Times Higher Education ranking of top world universities under 50 years (150 Under 50) placed UAB in **position 12 worldwide**, and first of all Spanish universities. Find all the information about the UAB in the rankings

3.3.2 PhD in Computer Science

The PhD in Computer Science (Excellence Mention, BOE 20-10-2011) at the UAB has the benefit of broad experience. It goes back to RD 185/1985, when the doctoral studies in computer science started at the UAB. The PhD programme in Computer Science prepares its students to join research teams working in the different areas of computer science, such as computer vision, information technologies, artificial intelligence, high-performance computing and computer security. These are fields in which the demand for experts is high, from companies both at home and abroad, so the chances of finding employment are very good. Moreover, the training received equips students to start up their own companies, often with support from the UAB itself. On completing the PhD programme in Computer Science at the UAB and defending their thesis, students have gone on to work in such companies as the following: Intel, Xerox, Hewlett Packard, Telefonica Research, Barcelona Supercomputing Centre, OCULUSai Technologies, iSOCO, SCYTL, STRANDS, Barcelona Digital, Cognicolor, Herta Security, Visual Tagging Systems, among others.

The PhD programme in Computer Science aims to offer a response to the need in society for highly qualified professionals with specific training in the field of computing. This is something that is not restricted to Catalonia but also applied in Spain and internationally. The PhD programme is therefore oriented towards attracting both local and international students. The programme has a clear commitment to the needs of the labour market and the training offered is specially designed for highly specialised positions in the computer sector. In order to improve the quality of the studies, this programme is included in the proposed Industrial Doctorate in Information and Communication Technologies, which brings together programmes from different Catalan universities.

Departments at the School of Engineering involved: Computer Architecture and Operating Systems; Computer Science; and Information and Communications Engineering

Link:http://www.uab.cat/web/postgraduate/phds/all-phd-programmes/general-information/computer-science-1345467765430.html?param2=1345657891663

UAB
Universitat Autònoma de Barcelona

Universitat Autònoma de Barcelona > Study Abroad > All PhD programmes > Technological Sciences > PhD in Computer Science (Lines of research and thesis supervision)

PhD in Computer Science

| General information | Research and supervision | Activities | Review | Admission | Registration | After registration | Quality |

Lines of research and thesis supervision | Thesis supervision | Thesis tutoring

Lines of research

In this section you will find all the lines of research on this PhD programme and its thesis supervisors. You will also find, in the right-hand column, the staff who can act as academic tutors.

Your thesis must have a single tutor, who may or may not be the same person as the thesis supervisor.

You can find detailed information on the functions and responsibilities of supervisors and tutors by clicking on the menu options **Thesis supervision** and **Thesis tutoring**.

3.3.3 PhD in Environmental Science and Technology

The PhD programme in Environmental Science and Technology (Excellence Mention, BOE 20-10-2011) aims to prepare doctoral students to acquire the necessary skills to carry out research. Emphasis is therefore placed on the incorporation of trainee researchers in one of the existing research groups. Special interest is placed on the transmission of methods and techniques necessary for carrying out research and writing the doctoral thesis.

A group of lecturers from different departments of the School of Engineering and UAB noticed as early as 1992 that there was a need to promote multidisciplinary studies in environmental science for the first time in Spain. The degree in environmental science was officially validated as a university degree in 1996. This created the demand for a centre open to students and lecturers and a useful and flexible communication school between the university, the administration, businesses and society at large. That centre is now the Institute of Environmental Science and Technology (ICTA), which belongs to the UAB and has incorporate researchers with long research careers and international experience and has launched highly prestigious interdisciplinary research groups.

Currently, the environment, as a result of its transversal nature, continues to be of interest in all areas of society and all fields of knowledge. Training and research in environmental science surpasses the specialised structure of the departments and divisions between disciplines. The mission of the ICTA is to promote, carry out and disseminate research as well as train researchers to be able to contribute to an understanding of environmental science and meet the challenges that arise from its interaction with society. The ICTA therefore offers this PhD programme in Environmental Science and Technology.

Institutions involved: Institute of Environmental Science and Technology (ICTA); and CSIC and universities with signed collaboration and thesis joint international supervision agreements

Link: http://www.uab.cat/web/postgraduate/phds/all-phd-programmes/general-information/environmental-science-and-technology-1345467765430.html?param2=1345658967920

Universitat Autònoma de Barcelona > Study Abroad > All PhD programmes > Sciences > PhD in Environmental Science and Technology (Activities)

PhD in Environmental Science and Technology

| General information | Research and supervision | Activities | Review | Admission | Registration | After registration | Quality |

Activities | Foreign residencies

Training activities

The PhD programmes include **research training** that is both transferrable and specific to the area of each programme and consists of both compulsory and optional activities.

All the activities that the PhD student must complete are recorded in an **activities document**, but in any case there are compulsory activities that must be completed in the first academic years. It may also include transferrable activities offered by the same university.

Other professional who are not PhD holders may participate in these activities as long as they hold a relevant qualification in the corresponding area.

For this PhD programme the following training activities are scheduled.

3.3.4 PhD in Biotechnology

Biotechnology is a sector with a clear capacity for transforming production and, therefore, the economy in areas such as human and animal health and the pharmaceutical industry (which is very important in Catalonia), food production, industrial sectors, such as chemistry and energy, and is a key factor in environmental management. Around the sector an entrepreneurial business networking has been set up and is becoming more consolidated every day. Our outlook also has international validity given that there are almost two thousand companies in Europe with this biotechnological profile.

The PhD in Biotechnology (Excellence Mention, BOE 20-10-2011) at the UAB aims to offer a response to social demand in this field to train PhDs to fill the forecast demand for professionals in this field. The PhD programme is therefore open to both local and international students. The programme is strongly committed to training PhDs capable of working in companies in health and agriculture and food companies and the biotechnology pharmaceutical and environment industries.

The aim of the **PhD in Biotechnology** to prepare students to be able to begin and complete training in theory, methodology and research in the multidisciplinary field of biotechnology, which is materialised in the production and public presentation of a complex, original and innovative doctoral thesis.

PhDs are expected to be able to carry out future research projects of high quality and international scope. The programme includes multidisplinary and interrelated subjects in genetics, molecular biology, microbiology, biochemistry and engineering designed to offer genetic solutions to industry in an integrated manner.

Departments involved: Biochemistry and Molecular Biology; Chemical, Biological and Environmental Engineering; Genetics and Microbiology

Link**:** http://www.uab.cat/web/postgraduate/phds/all-phd-programmes/general-information/biotechnology-1345467765430.html?param2=1345657888406
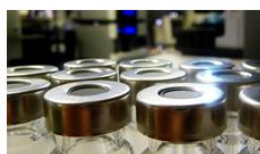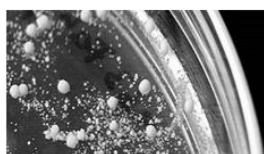
Universitat Autònoma de Barcelona > Study Abroad > All PhD programmes > Sciences > PhD in Biotechnology (Thesis supervision)

PhD in Biotechnology

| General information | Research and supervision | Activities | Review | Admission | Registration | After registration | Quality |

Lines of research and thesis supervision | Thesis supervision | Thesis tutoring

Thesis supervision

PhD thesis supervisor

The academic tribunal of the PhD programme assigns the PhD candidate a **thesis supervisor** at the time of registration, and this figure will be **responsible for the coherence and appropriateness of the activities,** impact and innovation in the subject field of the thesis and will guide the **planning and adequacy** of the research to other projects and activities.

The designation of a thesis supervisor may fall on any **Spanish or Foreign PhD** with accredited research experience independently of the university, centre or institution in which they work. At the same time, each PhD programme may establish additional criteria as necessary for the PhD thesis supervisor.

The **supervisor's responsibilities** are the following:

3.4. UAB Massive Open Online Courses (MOOC) at Coursera

UAB considers MOOC are a way to achieve these goals, and after analysing various alternatives, decided to enter Coursera, where the University operates since March 2013. In just over a year, the Autonomous University of Barcelona has become a reference in the world MOOC, both at Spanish and European level. Significantly, it is the only public university in the state that is inside this platform, where we can find only top-ranked universities such as Stanford, Princeton, Yale or Caltech for instance.

The range of courses reflects the diversity of studies at UAB. In this sense, courses such as *Egyptología, Precalculus, Digital Systems ,Corrección y estilo* en español, Olympic games and media, have already been offered successsfully. In addition, *Representaciones culturales de las sexualidades* is being offered, while others, such as and *Democracia y decisions participativas* – and the reeditions of Precalculus and *Egiptología* - will begin in the near future. English for Teaching Purposes completes the current UAB course portfolio, which can be found at http://www.coursera.org/uab/. Data regarding participation can be seen in the next table, which reflects that more than 100,000 students have already shown interest in UAB courses at Coursera.

All MOOC having the following characteristics:

- **Autonomy:** The structure is conceived to promote autonomous learning with a number of resources in the form of videos, links, documents, etc. and spaces for debate and communication.
- **Massive:** The number of places on courses is unlimited, the scope is global and the courses are aimed at people with different interests and aspirations.
- **On line:** To take these courses all you need is a computer, internet connections and the use of a global web server. You can learn at home conveniently, flexibly and at your own pace.
- **Open and Free:** The course materials are available on internet and are all completely free. Students just have to register beforehand.

Many lecturers at the School of Engineering have been involved in preparing MOOC lectures in Spanish: design and creation of video games (3 course specialization), image classification, object detection in images, pre-calculus, digital systems, and big data.

- Pre-Calculus (Jaume Pujol, Mercè Villanueva)
  https://www.coursera.org/learn/introduccion-al-calculo/

- Sistemas Digitales (Elena Valderrama, Mercè Rullan, Joaquín Saiz)
  https://www.coursera.org/learn/sistemas-digitales/

- Diseño y Creación de videojuegos (Enric Martí, Pere Nolla, Jordi Arnal)
  https://www.coursera.org/specializations/diseno-videojuegos

- Clasificación de imágenes (Ernest Valveny, Jordi Gonzalez, Ramon Baldrich)
  https://www.coursera.org/learn/clasificacion-imagenes/

- Detección de objetos (Ernest Valveny, Maria Vanrell, Antonio M. López)
  https://www.coursera.org/learn/deteccion-objetos/

- Detección de objetos (Tomàs Margalef, Antonio Espinosa)
  https://www.coursera.org/specializations/big-data-introduccion

3.5. Advancing in Teaching Quality and Equality

The professors at the School of Engineering take the premise that quality is not a concept that can be isolated, but an attitude and a way of making things that impregnates every single activity of an organisation. Indeed at the whole UAB, based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), the Royal Decree 1393/2007, of academic management of the recognised university degrees establishes the necessity of an Internal Quality Assurance System (IQAS), formally established and with public access, structured in processes that regulate all the aspects of the teaching practice: from the creation of new degrees and its monitoring and accreditation, human and material resources necessary to the correct development of the teaching task, evaluation and lifelong learning of teaching and administrative staff, till complaint management, stakeholders satisfaction and accountability to society.

All the faculties and the School of Engineering of the UAB have deployed and adapted the IQAS-framework of the UAB to their distinctive characteristics by means of the production of a particular IQAS-framework for each one of them. For the School of Engineering, quality is a strategic aspect for continuous improvement in the development of its tasks. The holistic nature of quality impregnates all the activities of the School. The implementation of processes that have as central axis quality is the consideration of a dynamic reality, where people are valued as a human factor and in which the organization works to find answers that are more appropriate to the training needs and individual and social realities. The description of all the processes of the School of Engineering (in Catalan) can be found here.

According to these quality processes, the professors at the School of Engineering are engaged in different quality innovation projects, like the MOOC courses described in the previous section. These projects are organized by FDES, a program of accreditation in Educational Training in Higher Education. Its purpose is to enhance the teaching competences of University professors, referring to the planning of the teaching-learning process, the use of teaching strategies and resources, and the evaluation system of students, all within the framework of the EHEA. It is aimed, preferably, on *novice* lecturers, i.e. with less than 5 years of teaching experience at UAB. The reader can consult the projects granted during 2018 here.

Indeed, the participation of professors at the School of Engineering in projects and courses related to teaching quality was the highest of all faculties of UAB in 2017:

Facultat	Total
Escola d'Enginyeria	9
Facultat De Filosofia I Lletres	8
Facultat De Ciències De l'Educació	7
Facultat Biociències	5
Facultat De Veterinària	5
Facultat De Medicina	4
Facultat Ciències Polítiques I Sociologia	3
Facultat d'Economia I Empresa	3
Facultat De Ciències De La Comunicació	3
Facultat De Dret	3
Facultat De Psicologia	3
Facultat Ciències	1
Facultat Ciències De l'Educació	1
Total projectes	**55**

In the next Table, the number of professors involved in teaching quality projects during 2017 are listed per department.

Department	Permanent	Novice	Total
Information and Communication Engineering	15	5	20
Computer Architecture and Operating Systems	7	1	8
Electronic Engineering	8	0	8
Chemical, Biological and Environmental Engineering	3	9	12
Microelectronics and Electronic Systems	5	0	5
Computer Science	14	2	16
Telecommunications and Systems Engineering	5	1	6
Totals	**57**	**18**	**75**

During this academic course 2018-19, the following professors from the School of Engineering developed a Quality Teaching project proposal as Principal Investigators:

- Albert Guisasola, "STIMAT: Estimular la utilització transversal de l'eina MATLAB en el Grau d'Enginyeria Química".
- Xavier Roca, "Sistema de suport a la correcció d'exàmens".
- Montserrat Sarrà, "Eines per a la millora de l'experimentació en Enginyeria Química".
- Elena Valderrama, "Harmonització de la línia d'Arquitectura de Computadors al voltant del RISC-V i el concepte de hardware obert".

In addition, several conferences have been programmed at the School of Engineering related to analysis of inequalities in higher education, and more specifically in the study and diagnosis of sexism and inequalities by disability, from an intersectional perspective.

Some invited talks were organized thanks to the work done by the Observatory for Equality of the UAB, for example the talk entitled "Invisible discriminations at work for men and women", performed by Dr. Amparo Ballester (University of Valencia), on May 7th 2019.

Another talks were co-organized by the School of Engineering and the Observatory of Women, Company and Economy, like for example the conference entitled "How and why to incorporate the gender perspective in teaching" on June 7th 2019, with speakers like Dr. Glòria González from the Dept. of Chemical, Biological and Environmental Engineering.

4. Research

UAB is internationally renowned for its quality and innovation in research. Thus, the UAB is well as occupying an outstanding position among Spanish universities in world rankings such as the QS World University Rankings (QS WUR), the Times Higher Education World University Rankings (THE WUR) and the Academic Ranking of World Universities (ARWU). It also ranks as one of the best young universities according to specific rankings made for universities less than half a century old by QS and Times Higher Education.

The School of Engineering is also a seedbed for quality researchers, and a centre for the transmission of knowledge and technologies to society, internationally recognised by its research. The teaching staff are members of different departments of the School of Engineering, where they carry out research tasks in different investigations and technological transfer projects.

The research carried out by the School's professors in fields related to the academic degrees entails a high impact in the quality of teaching, allowing students of the School to be in contact with real applications. In addition, some lecturers carry their research activities outside the School, at the research centers nearby: Artificial Intelligence Research Institute (IIIA) of the CSIC, Computer Vision Centre (CVC), Institute Microelectronics of Barcelona (IMB-CNM), CSIC Scientific Information Port (PIC), Institute of Space Studies of Catalonia (IEEC), and the Centre for Mathematical Research Laboratory Experimental Applus+.

4.1 The Research Groups

Research at the School of Engineering is carried out in the departments through the research groups recognised by UAB and Generalitat de Catalunya. These are compact groups of researchers focusing on specific areas of Information and Communication Technologies. The scientific output of the research groups attached to the School of Engineering includes European and national projects, technological transfer activities (like patents and spin-offs), publications, conferences, invited talks, etc. The list of Research Groups of the School of Engineering is as follows:

1. Advanced Driver Assistance Systems
2. Antennas and Microwave Systems
3. Aplicacions Electro-Magnètiques Industrials
4. Automation and Advanced Control Systems
5. Biodegradation of Industrial Pollutants and Waste Valorization
6. Biological Treatment and Valorisation of Liquid and Gaseous
7. Biomedical Applications
8. Bioprocesses Engineering and Applied Biocatalysis
9. Cell and Bioprocess Engineering
10. Circuits and Electronic Systems
11. Coding and Information Networks
12. Coding, Compression and Security
13. Color in Context
14. Combinatorics, Coding and Security
15. Composting of Solid Organic Waste
16. Computational Nanoelectronics
17. Document Analysis

18. Embedded Computing in HW/SW Platforms Laboratory
19. High Performance Computing Applications for Science and Engineering
20. High Performance Computing for Efficient Applications and Simulation
21. Image Social Evaluation Laboratory
22. Integrated Systems and Circuits Design
23. Interactive and Augmented Modelling
24. Interactive Coding of Images
25. Machine Vision
26. Microwave, Metamaterials and Antenna Engineering Group
27. Modelling and Simulation of Logistical Systems
28. Nano-optoelectromechanical Systems for Energy Laboratory
29. NeuroComputation and Biological Vision Team
30. Reliability of Electron Devices and Circuits
31. Security and Networks and Distributed Applications
32. Signal Processing for Communications and Navigation
33. Software-Hardware Agent-based Distributed Embedded Systems
34. Sustainability and Environmental Prevention
35. Wireless Information Networking

4.1.1 Advanced Driver Assistance Systems

RESEARCH GROUP DIRECTOR: Dr. Antonio López

MEMBERS: 10

WEBSITE: **http://www.cvc.uab.es/~antonio/**

DEPARTMENT GROUP ATTACHED TO: Computer Science – Computer Vision Center

KEY WORDS:

- Computer Vision
- Artificial Intelligence
- Computer Science

RESEARCH AIMS:

Intelligent vehicles refer to cars, trucks, buses etc. on which sensors and control systems have been integrated in order to assist the driving task, hence their name Advanced Driver Assistance Systems (ADAS).

The aim is to combine sensors and algorithms to understand the vehicle environment so that the driver can receive assistance or be warned of potential hazards. Vision is the most important sense employed for driving, therefore Computer Vision can play a very important role in these systems.

In this context, our group is focused on combining computer vision techniques as pattern recognition, feature extraction, learning, tracking, 3D vision, etc. to develop real-time algorithms able to assist the driving activity. Examples of assistance applications are: Lane Departure Warning, Collision Warning, Automatic Cruise Control, Pedestrian Protection, Headlights Control, etc.

The group started in year 2002 and founding comes from R&D governmental competitive projects as well as private companies, mainly of the automotive sector. The group has the category of "Grup Consolidat" (consolidated group) given by the Autonomous Government of Catalonia.

4.1.2 Antennas and Microwave Systems

RESEARCH GROUP DIRECTOR: Dr. Josep Parron Granados

MEMBERS: 12

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DEPARTMENT GROUP ATTACHED TO: Telecommunications and Systems Engineering

KEY WORDS:

- Computational electromagenetism. Antennas

- Materials for high frequency

- Microwave and milimetric circuits and systems

- Measurement techniques, characterisation of devices

RESEARCH AIMS: To offer technological solutions so that subsystems that form part of the physical layer of a wireless communication system may fulfil certain specifications.

81
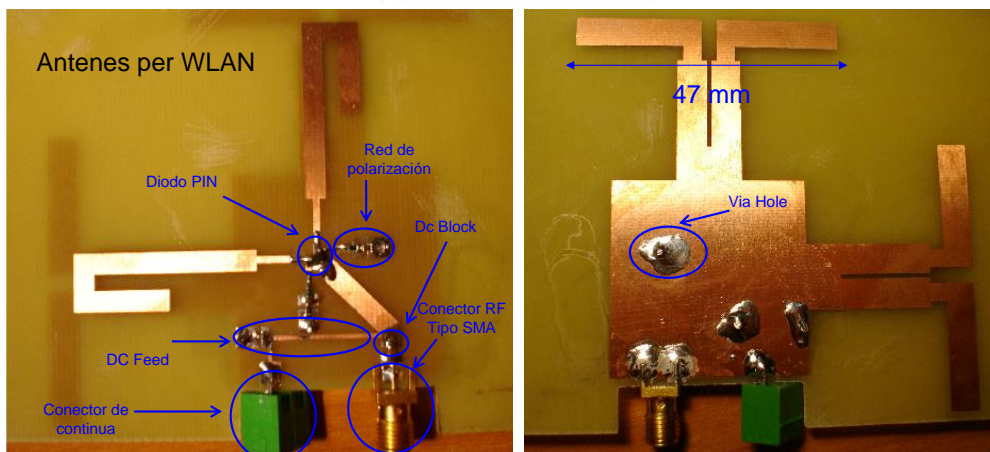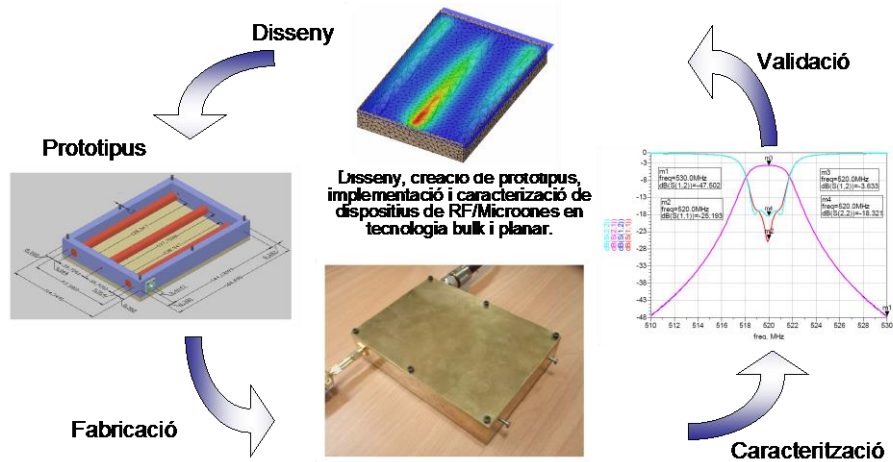
4.1.3 Aplicacions Electro-Magnètiques Industrials

RESEARCH GROUP DIRECTOR:	Juan José García
MEMBERS:	4
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E-MAIL:	Joan.Garcia@uab.cat
DEPARTMENT GROUP ATTACHED TO:	Electronics Engineering

KEY WORDS:

- Microwave Passive Devices.
- Metamaterials.
- Electroperforation and Electroportation.
- Harvesting.

RESEARCH AIMS:

The group's goal is to develop quality research, susceptible to produce real technology transfer in the nearest industrial environment. Group's activities cover 4 areas of activity supported by national projects and collaboration agreements with companies.

(a)Electroperforation System designed by GAEMI. (b) Electronics inside the prototype. (c) Circular electrodes scheme for electroportation

Electroportation (a) External view of the electric generation prototype. (b) Electronics inside the prototype. (c) Electroportation screens in pcb.
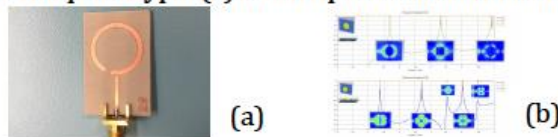
(a) Microstrip tag for 3-bits codification (b) spectrum of the resonances

Harvesting system (a) external view (b) pcb picture (c) layout scheme.

4.1.4 Automation and Advanced Control Systems

RESEARCH GROUP DIRECTOR: Dr. Ramón Vilanova Arbós

MEMBERS: 7

TELEPHONE: 34 93 581 2197

E-MAIL: ramon.vilanova@uab.cat

DEPARTMENT GROUP ATTACHED TO: Telecommunications and Systems Engineering

KEY WORDS:

- Automation
- Systems integration
- Prediction control
- Robust control
- Systems identification
- Control of biotechnological systems
- Dynamic production management

RESEARCH AIMS:

The common objective of the activities of this group is to be able to summarise how improvements in the performance o industrial production systems. This efficiency, measured among other things in terms of production time, quality, flexibility and security. The group's projects cover the production system on all its hierarchical levels from dynamic production management, approached as a specific problem, to the design of integrated automation and control projects, where the integrated management of industrial plant and communications systems are leading elements, to the specific study of regulation and control systems, where different advanced control techniques are being studied.

4.1.5 Biodegradation of Industrial Pollutants and Waste Valorization

RESEARCH GROUP DIRECTOR: Dr. Maria Teresa Vicent Huguet

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E-MAIL: teresa.vicent@uab.cat

DEPARTMENT GROUP ATTACHED TO: Chemical, Biological, and Environmental Engineering

KEY WORDS:

- Biodegradation

- Ligninolytic fungi

- Xenobiotics,

- Bioremediation

- Anaerobic Digestion

RESEARCH AIMS (2014-SGR-474):

The overall goal of our research is developing bioprocesses to remove industrial contaminants present in wastewaters, sediments or soils.

These contaminants are usually recalcitrant to conventional biological treatments and accordingly we focus in the development of bioprocesses that use the most appropriate microorganism for each case: anaerobic bacteria, fungi or algae. In the past several years our research group intensively studied the use and application of white-rot fungi to take advantage of their unspecific oxidative enzymatic systems able to degrade a wide array of both emerging and priority contaminants in effluents. Currently, our research also covers the bioremediation of groundwater contaminated with chloroorganics by organohalide-respiring bacteria. These bacteria can gain energy from the transformation of such contaminants to less chlorinated and environmentally friendly compounds. In the case of microalgae, we study the assimilation of nutrients and the degradation of emerging contaminants in urban wastewaters and digestate.

The objective in all the processes is to achieve a closed waste cycle and reuse the treated water. This aspect is of special interest for bioprocesses using microalgae because it is a low-cost technology that can produce energy after the methanization of microalgae, resulting in a more environmentally and financially sustainable process.

Our research moves from basic research to the design of the most suitable reactor to treat specific environmental matrices.

4.1.6 Biological Treatment & Valorisation of Liquid & Gaseous Effluents

RESEARCH GROUP DIRECTOR: Dr. Francisco Javier Lafuente Sancho

MEMBERS: 18

TELEPHONE: 34 93 581 2143

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DEPARTMENT GROUP ATTACHED TO: Chemical, Biological, and Environmental Engineering

KEY WORDS:

- Biological treatment and Nutrient removal
- Urban and industrial liquid effluents
- Treatment of gaseous effluents
- Monitoring and control, Modelling
- Resource recovery

RESEARCH AIMS (2014-SGR-1255):

GENOCOV stands for **Research Group on Biological Treatment and Valorisation of Liquid and Gaseous Effluents**. The group is composed by researchers of the Department of Chemical, Biological and Environmental Engineering of the School of Engineering at UAB. GENOCOV has been active over the last 25 years in the study of biological processes for the treatment of urban and industrial water and gaseous effluents, with special emphasis on monitoring, modelling and control of complex biological systems, both continuous and discontinuous in the field of Chemical and Environmental Engineering. During the last years, the group has been also active in the field of resource recovery.

The group is highly active in research, including: i) Participation in several EU projects and other projects funded by the Spanish Government, ii) Publication of 95 peer-reviewed international journals publications during the last 5 years, iii) Important participation in international conferences. The research group activities are focused on Urban and Industrial Wastewater Treatment, Valorisation of Effluents, and Characterization and Treatment of Gaseous Effluents. These activities are presented in the following research areas: Conversion of chemical scrubbers into biotrickling filters; Treatment and resource recovery of highly-loaded off-gases; Characterization and biofiltration of odorous effluents; Industrial water treatment; Recovery of biopolymers; Urban wastewater treatment; Fundamentals of bioelectrochemical systems; and Scaling-up bioelectrochemical systems.

Visit our website **http://www.genocov.com/** for further details.
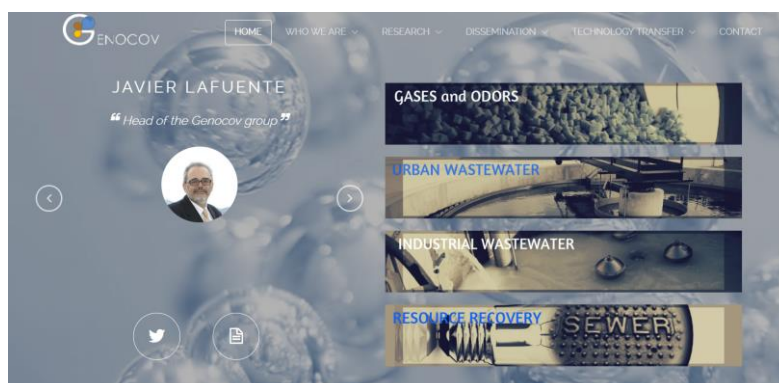
4.1.7 Biomedical applications

RESEARCH GROUP DIRECTOR: Dr. Jordi Aguiló Llobet

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DEPARTMENT GROUP ATTACHED TO: Microelectronics and Electronic Systems

KEY WORDS:

- Tools and devices for brain and mental health
- Micro-Nano-Bio systems
- Biomedical engineering
- Domotics for limited mobility
- Geriatrotecnologies

RESEARCH AIMS:

- To study and develop technology based applications in fields related with medicine, health, and wellbeing and specially those related with brain health and mental health. This involves R+D+I in micro-nano-bio and info technologies, as well as biomedical research and even clinical research.

- To study the use of integrated systems in the development of applications aimed to increase personal independence in the case of people with disabilities and elderly people.

4.1.8 Bioprocess Engineering and Applied Biocatalysis

RESEARCH GROUP DIRECTOR:	Dr. Francisco Valero Barranco
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DEPARTMENT GROUP ATTACHED TO:	Chemical, Biological and Environmental Engineering

KEY WORDS:

- Bioreactors, fermentation engineering, production of recombinant proteins.

- Monitoring, modelling and control of bioprocesses, enzymatic processes.

- Biotransformations, separation and purification processes.

- Metabolic engineering, physiological quantitative analysis.

RESEARCH AIMS (2014-SGR-452): The overall objective of this group is to develop integrated and multidisciplinary biotechnological processes to obtain products of interest for the chemical, pharmaceutical, food & beverage and health industries. Thus, the research group develops its activities in the field of Industrial Biotechnology (or White Biotechnology). The research interests are focused on microbial production of recombinant proteins and (multi) enzymatic processes, of stereoselective synthesis, developing methodologies and strategies to obtain several products at laboratory and pilot plant scale:

Laboratory of Bioprocesses engineering: The selected biological host systems are the prokaryotic system *E. coli* and the eukaryotic system *P. pastoris*. The aim is to develop standardized methodologies to stablish the optimum operational strategies that could be applied to different target proteins.

Laboratory of System Biology: The research objectives are related to the application of tools, methodologies and principles of Systems Biology and Synthetic Biology in the field of Metabolic Engineering. This research programme aims to integrate and apply these results in the Bioprocess Engineering context, in close relation to other research lines of the group.

Laboratory of Applied biocatalysis: The aim is the use of selected biocatalysts, mainly aldolases, lipases, aminotransferases and oxidoreductases in enantioselective synthesis. The research group aims to design and operate enzymatic reactors in non-conventional media and to develop enzyme cascade synthesis processes .

Fermentation Pilot Plant (PPF): The PPF has the mission to promote the transfer of knowledge and experience in bioprocesses to the pharmaceutical, chemical, veterinary and agri-food sectors, facilitating the implementation of advanced technologies on an industrial scale to provide competitiveness to these companies. The PPF works with the aim to become a reference in bioprocesses development, improvement and innovation, providing scientific and technological support for semi-industrial scale cultivation of microorganisms and development of enzymatic processes. The centre has the equipment suitable for bioprocess development in bioreactors and first steps of product recovery and purification.

On the PPF website (http://ppf.uab.cat/) more information about the activities and projects where the PPF has collaborated can be found.

4.1.9 Cell and Bioprocess Engineering – GECIB

RESEARCH GROUP DIRECTOR: Dr. Francesc Gòdia Casablancas

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DEPARTMENT GROUP ATTACHED TO: Chemical, Biological, and Environmental Engineering

KEY WORDS:

- Animals cells, Mammalian and insect cells
- Bioprocess Development
- Optimization of Cell culture strategies
- Biopharmaceuticals and Vaccine production
- Metabolic engineering

RESEARCH AIMS (2014-SGR-1544):

The activity of the GECIB research group is centred on bioprocess development and optimization, using animal cells platforms for the production of biopharmaceuticals and vaccines. Established mammalian and insect cell lines (hybridoma, CHO, HEK 293, CAP, etc.), which can be cultured indefinitely *in vitro,* are superior eukaryote cells that show unique capacities for intracellular processing, making them ideal hosts for obtaining complex proteins in applications in the field of treatment and diagnosis of diseases. The work of the group is focused on several aspects:

a) To develop intensive, automated and controlled culture systems and operational strategies using bioreactors, offering optimum performance, usually targeted to maximize product concentration and quality. To this end, optimized culture strategies are developed, based on fed-batch and perfusion culture.

b) To develop and use single use bioreactors and purification equipment.

c) To understand the metabolic and physiological characteristics on the processes studied, including intracellular events tracking, in order to guide the improvements both at cell engineering and bioprocess engineering level.

d) To improve cultured cells through engineering (metabolic engineering) which is achieved by the introduction of new activities (genes) to the cell, particularly for the gene of interest, expressing the targeted protein product.

This research activity is developed either with public funds or via contracts and collaboration with companies. Among them: Laboratorios HIPRA, Laboratorios Esteve, Albumedix (Novozymes group), NovoNordisk Pharmatek, Farmahispania and Cevec. There is also a solid international collaborations, for example with McGill University (Montreal, Canada).

Current products studied include several therapeutic and diagnostic proteins, including Monoclonal Antibodies (MAbs), and recombinant proteins and Virus Like Particles (VLPs) for new generation vaccine development.
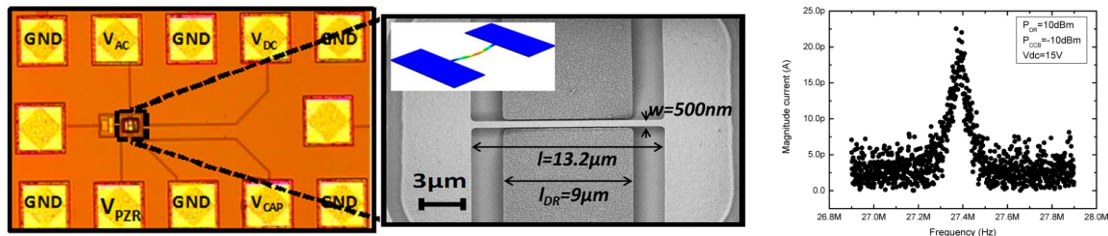
4.1.10 Circuits and Electronic Systems

RESEARCH GROUP DIRECTOR: Dr. Nuria Barniol Beumala

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E-MAIL: nuria.barniol@uab.cat

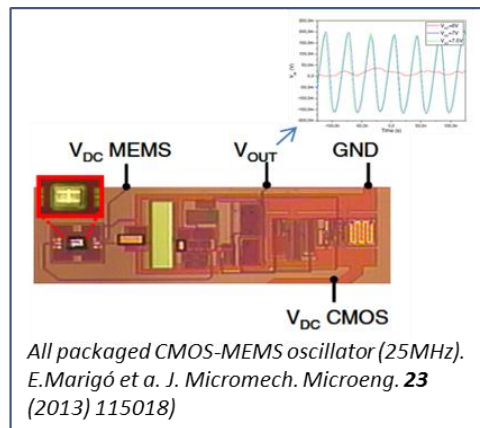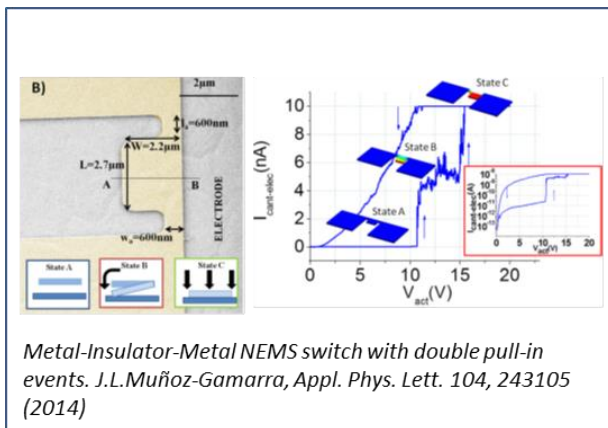**DEPARTMENT GROUP ATTACHED TO:** Electronics Engineering

KEY WORDS:

- MEMS, NEMS, RF-MEMS
- CMOS-VLSI
- Resonators

RESEARCH AIMS:

Design, fabrication and characterization of Micro and Nanoelectromechanical systems (MEMS/NEMS) towards novel high sensitivity sensors, micro and nano mechanical relays for low power computing and integrable radiofrequency systems based on MEMS-oscillators. The research includes aspects from the design of the integrated system based on CMOS technology, as well as the design of new micro and nano electromechanical resonators and its integration in standard CMOS technology .

Clamped-clamped Polysiclicon beam with piezoresistive transduction. E.Marigó et al. Sensors 2015, 15, 17036

Metal-Insulator-Metal NEMS switch with double pull-in events. J.L.Muñoz-Gamarra, Appl. Phys. Lett. 104, 243105 (2014)

All packaged CMOS-MEMS oscillator (25MHz). E.Marigó et a. J. Micromech. Microeng. **23** (2013) 115018)

4.1.11 Coding and Information Networks

RESEARCH GROUP DIRECTOR:	Dr. Àngeles Vàzquez
MEMBERS:	5
TELEPHONE:	34 93 581 4246
E-MAIL:	angeles.vazquez@uab.cat
DEPARTMENT GROUP ATTACHED TO:	Telecommunications and Systems Engineering

KEY WORDS:

- Network softwarization and virtualization in the 5G context.

    - Software defined networks.

    - Network function virtualization.

    - Network architectural programmability.

- Algebraic coding and network coding

    - Communication and computation.

    - Security at packet and physical levels.

    - Engineering of information flows.

RESEARCH AIMS:

- **5G concepts of network softwarization, virtualization and cloudification.**

    Design and optimization of information networks across all protocol layers, especially wireless networks and their performance evaluation. Advance the state-of-the-art with solutions based on 5G concepts and techniques and experimental test.

    The advent of 5G technologies drives the future evolution of Internet and information netwoks in general. We look into software defined networking (SDN) solutions for greater network programmability and dynamicity to solve traditional routing-based networking. Network softwarization comes together with a completely different networking paradigm based on virtualization of communication resources and cloudification of computation resources.

- **Algebraic coding and network coding**

    Network coding is a broad concept that has attracted much interest among experts in diverse fields, like coding theory, cryptography, and information theory and it is clearly applicable to real packet networks for the control and engineering of the information flow. Applicability is not confined to a single layer in the protocol stack. We look into the development of novel algebraic constructions that can be applicable at different communication levels. We also look into its integration within the context of 5G networking trends such as network sofwarization, clodification or virtualization.

- **International projection**

    Participation in excellence network and publishing in prestigious congresses and journals

4.1.12 Coding, Compression, Security

RESEARCH GROUP DIRECTOR:	Dr. Joan Serra-Sagristà
MEMBERS:	14 (only PhD)
TELEPHONE:	+34 93 581 32 71
E-MAIL:	Joan.Serra@uab.cat
DEPARTMENT GROUP ATTACHED TO:	Information and Communications Engineering

KEY WORDS:

- Algorithms, cryptography, security
- Coding Theory
- Combinatorics
- Computational algebra
- Data Compression
- Delay Tolerant Networking
- Digital Image Consulting
- Information coding
- Internet security
- Mobile agents
- Opportunistic communications
- Standards and Applications
- Security
- Software developments

RESEARCH AIMS (Recognized Consolidated Group):

The mission of the *Coding, Compression and Security (CCS)* research group has not changed since first founded in 1988; it deals fundamentally with the study and the implementation of methods, algorithms and prototypes to achieve reliability, security and efficiency in the telematic processing of information. The specific research performed by the different teams involved in the consolidated research group (SGR) is summarized by the keywords quoted above.

4.1.13 Color in Context

RESEARCH GROUP DIRECTOR:	Dr. Maria Vanrell
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DEPARTMENT GROUP ATTACHED TO:	Computer Science – Computer Vision Center

KEY WORDS:

- Artificial intelligence
- Computer vision
- Colour
- Texture
- Computational perception

RESEARCH AIMS:

The goal of this research line is to work on the definition of computational colour and texture representations. We focus on the basis of colour and texture perception, in order to automatize the task of giving judgements about the colours and the textures of an image. It can be useful for different computer vision applications involving colour and texture, such as, automatic image annotation, colour assessment on textured surfaces, estimation of illuminant, etc. To this goal, the group works on six different research areas:

- **Colour constancy:** the work focuses on building algorithms to estimate scene illuminant from the image content.
- **Colour-Texture perception:** the work focuses on computational models that simulates the chromatic induction of the human visual system**.**
- **Colour sharpening** to get enhanced versions of colour images.
- **Colour naming** to simulate the task of assigning a colour name or category to an specific image segment.
- **Texture description:** the work focuses on blob detection, as the basis for a high level and non-numeric description of textures.
- **Colour & texture grouping** to define mechanisms for segmenting images according to the chromatic and spatial relationships of the image elements.

4.1.14 Combinatorics, Coding and Security Group

CCSG
Combinatorics, Coding
and Security Group

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DEPARTMENT GROUP ATTACHED TO:	Information and Communications Engineering

KEY WORDS:

- Error correcting codes
- Optimal codes
- Combinatorics
- Information theory
- Computational algebra
- Algorithms
- Cryptography
- Security.

RESEARCH AIMS:

The main purpose of this research group is to significantly advance knowledge through study, construction and classification of error correcting codes, especially optimal codes, that can be applied in many different environments where it is necessary to ensure an error free transmission. The techniques used to achieve this goal are both algebraic and combinatorial. The research group participates in the development of MAGMA software packages that are basic tools in the experimentation and simulation of the behaviour of error correcting codes. CCSG also carries out research collaborations among national and international research groups, and improves the technological transfer through research agreements of competitive projects.

4.1.15 Composting of Solid Organic Waste

RESEARCH GROUP DIRECTOR:	Dr. Antoni Sánchez Ferrer
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DEPARTMENT GROUP ATTACHED TO:	Chemical, Biological, Environmental Engineering

KEY WORDS:

- Composting, compost, organic wastes
- Anaerobic digestion, digestate
- Solid-state fermentation, bioproducts
- Respirometry, biological activity, stability
- Environmental impact, LCA
- Environmental nanotechnology, nanotoxicology

RESEARCH AIMS (2014-SGR-343):

The main objective of our research group is the study of biological treatments applied to organic solid wastes, which involves the study of the process in terms of technical optimization and control, monitoring, environmental impact and LCA. Our studies cover from the microbiology of the process to the reactor design and production strategies. This general objective is divided into a number of specific fields:

1. **Composting** and co-composting studies, mainly focused on critical aspects of the process, such as stability and biological activity (measured by dynamic respiration), process control, environmental impacts and derived atmospheric emissions.

2. **Solid-state fermentation** (SSF) applied to organic wastes to obtain bioproducts of interest in a solid phase aerobic fermentation. Examples of the bioproducts studied include: enzymes, bioethanol, aromas, biosurfactants and biopesticides. Again, microbial aspects and reactor design configuration are studied.

3. **Anaerobic digestion** of organic wastes, especially when this technology is coupled to a composting or SSF process to stabilize the final product in a zero waste strategy. Also, the use of nanotechnology to enhance the biogas yield.

4. **Nanotechnology for the environment**: which covers the study of the nanotechnology to solve environmental problems such as cleaning of polluted waters by heavy metals or the adsorption and conversion of greenhouse gases. The possible toxicological problems of the nanomaterials used are also studied.

More information is available at: www.gicom.cat

4.1.16 Computational Nanoelectronics

RESEARCH GROUP DIRECTOR: Dr. Jordi Suñé Tarruella

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**DEPARTMENT GROUP ATTACHED TO:**   Electronics Engineering

KEY WORDS:

- Micro and nanoelectronic devices, CMOS, reliability, spintronics, resistive switching
- Nanotubes and nanowires, graphene and 2D related materials, computational electronics, compact models
- Monte Carlo simulation, electronic transport

RESEARCH AIMS:

Our research field involves the simulation, modelling, characterisations and reliability of micro and nanoelectronic devices. Specifically our work is centred on the study of emerging devices through a multidimensional focus that comprises the used of first principle methods to the Monte Carlo simulation and compact modelling.

In order to carry out these aims we have financing from research agreements with both the private and public sectors

- **Samsung Electronics:** *Graphene based technologies*
- **Ministerio de Economía y Competitividad:** *Transporte de electrones y fonones en nanodispositivos para aplicaciones de bajo y cero consumo.*
- **Generalitat de Catalunya:** *Enginyeria de dispositius micro i nanoelectrònics*
- **European Union:** *Graphene Flagship Project; Pilot line for Advanced Nonvolatile memory technologies for Automotive microControllers, High security applications and general electronics*
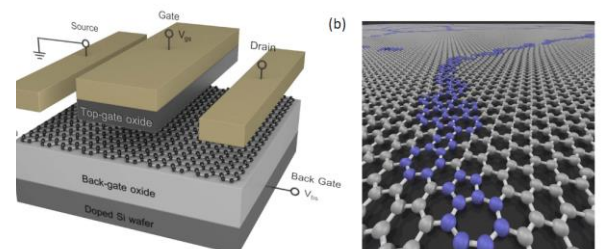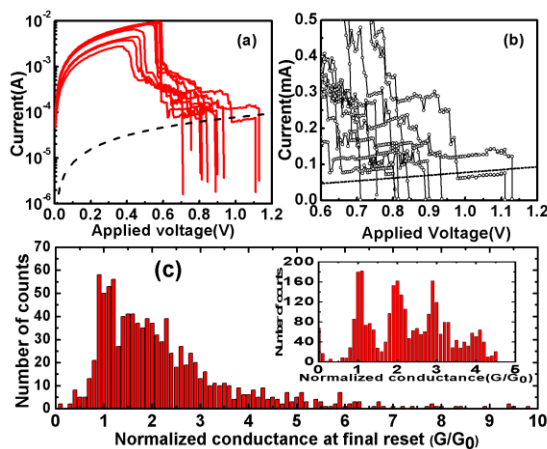
Graphene field-effect transistor   *Resistive switching (conductance quantization)*

4.1.17 Document Analysis (DAG)

RESEARCH GROUP DIRECTOR:	Dr. Josep Lladós
MEMBERS:	19
WEBSITE:	**http://dag.cvc.uab.es**
DEPARTMENT GROUP ATTACHED TO:	Computer Science – Computer Vision Center

KEY WORDS:

- Artificial intelligence
- Computer vision
- Document analysis
- Optical character recognition (OCR)
- Graphics recognition

RESEARCH AIMS:

Document Analysis is a discipline that combines image analysis and pattern recognition techniques to process and extract information from documents from different sources. Sources include either raster formats, after scanning paper-based documents, or electronic formats such as ps, html, pdf, etc.

Document Analysis consists of three major research subfields: paper layout analysis, optical character recognition and graphics recognition. The Document Analysis Group has research and development experience in the following concerns: symbol recognition, indexing and browsing by graphical content, sketchy interfaces, diagrammatic reasoning and visual languages for graphic documents, graphics recognition architectures, reading systems for forms and structured documents, camera-based OCR, fingerprint recognition, from different sources. Sources include either raster formats, after scanning paper-based documents, or electronic formats such as ps, html, pdf, etc.

## 4.1.18 Embedded computation in HW/SW Platforms Laboratory

RESEARCH GROUP DIRECTOR:	Dr. Jordi Carrabina Bordoll
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DEPARTMENT GROUP ATTACHED TO:	Microelectronics and Electronic Systems

KEY WORDS:

- Embedded High Performance Computing (eHPC)

- Reconfigurable FPGA systems

- Multimedia and Mobile Technologies

- Printed and Flexible Electronics

- Internet-of-Things (ioT)

- MATLAB-Simulink

- Electronic Prototyping and Embedded Platforms

RESEARCH AIMS:

- R+D activity in the formalisation, development and application of highly flexible reconfigurable computing platforms (in its broadest sense) oriented towards the design of ICT systems, using up-to-date computing platforms and communication protocols focusing of energy efficiency and high performance

- Applied Research and Technology Transfer in specialized application domains and technologies: embedded systems, multimedia and mobile technologies, IoT and printed electronics.

- Development design methodologies to increase design productivity at electronic system level: from high-level languages for System-level Design to Design resources at IP-core level.

- Designing, implementing and validating physical and virtual platforms using flexible reconfigurable subsystems and components (both commercial and proprietary).
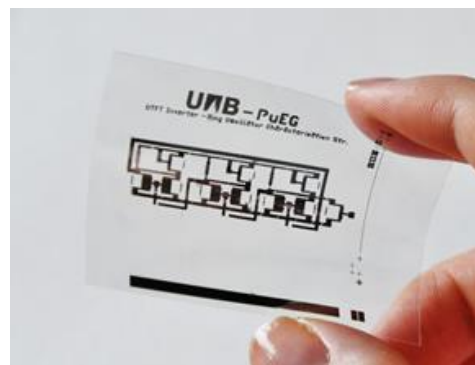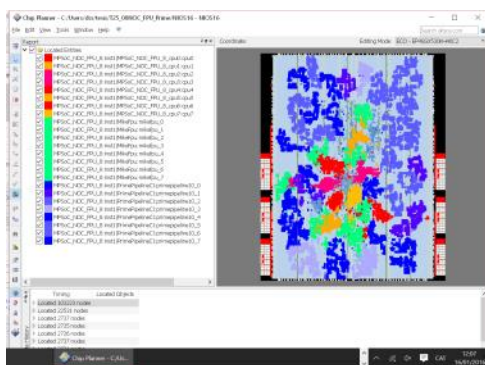
4.1.19 High Performance Computing Applications for Science and Engineering

RESEARCH GROUP DIRECTOR: Dr. Tomàs Margalef

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TELEPHONE: +34 93 581 3537

E-MAIL: tomas.margalef @uab.cat

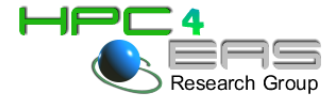DEPARTMENT GROUP ATTACHED TO: Computer Architecture and Operating Systems

KEY WORDS:

- Parallel and distributed processing, performance analysis
- Automatic Application tuning
- Life sciences High Performance computing applications
- Environmental applications
- Computational thinking and performance engineering for science and engineering
- Exploiting accelerators and new multi/many cores architectures

RESEARCH AIMS:

- In HPCA4SE we focus our interest researching and developing in the field of high performance computing systems. Our applications are oriented to science and engineering fields, and we focus on both basic and applied research.

- Therefore our researchers work studying and using advanced computing platforms such as multy/many core processors or GPUs, distributed systems, supercomputers, etc.. The models and tools obtained improve ease of use and performance of these systems.

- Among our activities is also included the use of high performance computing systems through the analysis, development and tuning, applied to various scientific fields such as bioinformatics, simulation of natural phenomena or industrial components, etc.

4.1.20 High Performance Computing for Efficient Applications and Simulation

|	
RESEARCH GROUP DIRECTOR:	Dr. Emilio Luque Fadón
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E-MAIL:	emilio.luque@uab.cat
DEPARTMENT GROUP ATTACHED TO:	Computer Architecture and Operating Systems

KEY WORDS: Parallel and Distributed Processing, Performance Prediction & Scalability-Fault-Tolerance Analysis, Application Vulnerability & Network Interconnections, High Performance Simulation, ABM/IoM Simulations.

RESEARCH AIMS: The HPC4EAS Group integrates a series of lines of research, interrelated and developed in the context of High Performance Computing (HPC)

The project aims to provide solutions to the following problems, while it creates the corresponding technology that allows these solutions to be transferred:

- Performance and Efficiency in the use of HPC resources
  - Efficient execution of applications. Performance prediction. Scalability. Effect of the interconnection network on the performance of applications
- Availability of HPC resources (available to user)
  - Fault tolerance for HPC.
  - Integrity against attacks to the HPC resources (Vulnerability)
- Design & optimization of HPC systems for "workloads" specific (application-specific domains): CPU, network interconnection, I/O & Availability.
- Social projection (impact) applications (require the capacity of HPC systems):
  - Simulation & optimization of Emergency Services in Hospitals (Smarter Health Services); Simulation of Individuals oriented Models; Simulation & optimization of movements of individuals in critical situations (Emergency Evacuations).
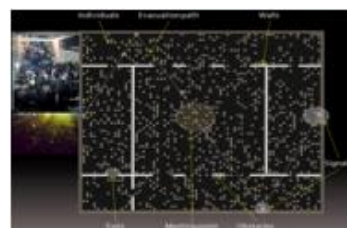
Emergency Service Simulation

ABM Evacuation Simulation
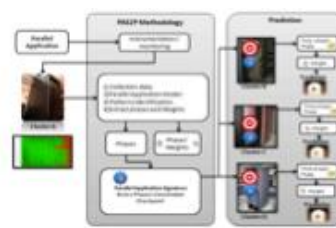
RADIC (Fault Tolerance Architecture)

Performance & Scalability Prediction
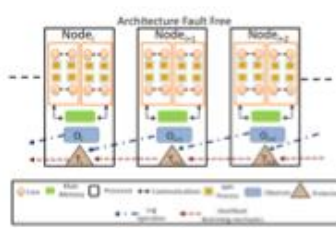
4.1.21 Image Social Evaluation (ISE) Lab

RESEARCH GROUP DIRECTOR: Dr. Jorge Bernal

MEMBERS: 9

WEBSITE: http://iselab.cvc.uab.es

DEPARTMENT GROUP ATTACHED TO: Computer Science – Computer Vision Center
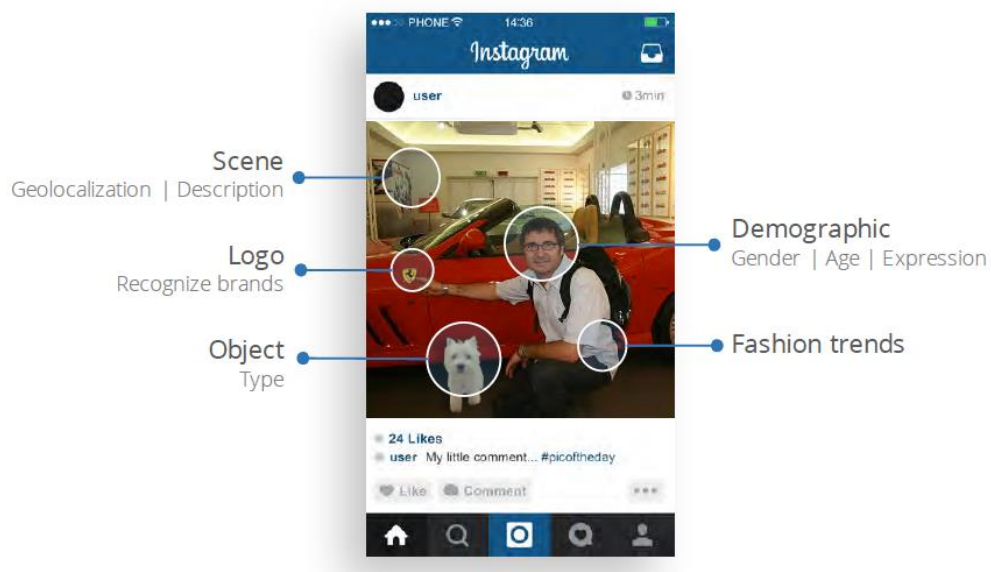
KEY WORDS:

- Vision and Language
- Social Media Analysis
- Human-centered Image Analysis
- Statistical Methods & Learning

RESEARCH AIMS (2014-SGR-159):

The social media, as a major platform for communication and information exchange, provides a rich repository of people's opinions and sentiments about a vast spectrum of topics. However, the massive growth of photo and video sharing is increasingly eclipsing text on the leading visual social platforms. So visual communication is complementing and even supplanting the written word, and this visual language is a powerful way for people to express themselves.

Consequently, there is a need for developing new tools to understand the content expressed in shared images, which will greatly benefit social media communication and will enable broad and promising applications in education, advertisement and entertainment. Following these trends, the ISE Lab aims to develop robust and accurate tools for automatic social image captioning, i.e. inferring semantic content and contextual scene knowledge based on the millions of images uploaded at social networks.

4.1.22 Integrated Systems and Circuits Design

RESEARCH GROUP DIRECTOR: Dr. Carles Ferrer Ramis

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DEPARTMENT GROUP ATTACHED TO: Microelectronics and Electronic Systems

KEY WORDS:

- Low power ROICs design

- Systems-on-chip design and reconfigurable FPGAs.

- Fault tolerant and security Hw

- IoT Hw platform

- Wireless sensor integration

- Energy harvesting and power management

- Modelling and simulation of heterogeneous systems

- Industrial, aerospatial and veterinarian applications

RESEARCH AIMS:

The activity of this research group is focussed on the development of microinstrumentation for IoT applications, including system-on-chip design (SoCs) based of digital analogue and mixed ASIC and FPGA technologies, as well as transconductor elements (sensors and actuators) and the distribution of potential. We are therefore developing design methodologies that allow the integration of all these technologies through the use of high level hardware description languages (VDHL, VHDL-AMS, ...) which allows the behavioural description of electronic system elements in terms of their design and the process of qualification for aerospace applications. We are also working on research into specific architectures for the development of microinstrumentation based on microsystems and low power solutions.

This research group is attached to the IMB-CNM (CSIC) and the Centre for Space Studies and Research, CERES (IEEC-UAB).

4.1.23 Interactive and Augmented Modelling

RESEARCH GROUP DIRECTOR: Dr. Debora Gil

MEMBERS: 5

WEBSITE: http://iam.cvc.uab.es

DEPARTMENT GROUP ATTACHED TO: Computer Science – Computer Vision Center
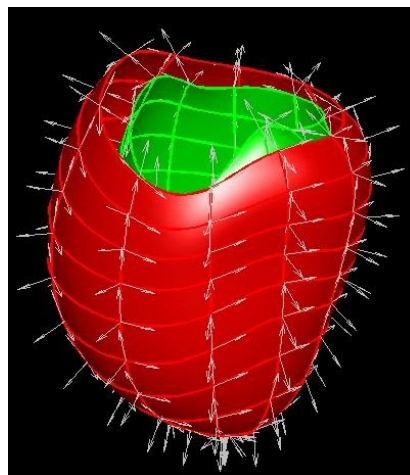
KEY WORDS:

- Computer Vision
- Medical image analysis
- Augmented reality
- Artificial Intelligence
- Computer Science

RESEARCH AIMS:

Research is focused on developing mathematical tools, interactive and augmented reality visualization environments. The main application field is biomedical image processing.

The group is a multidisciplinary team (including mathematicians and computer science engineers) specialized in the treatment and analysis of biomedical images. They use graphics techniques and mathematical models for the visualization and modelling of anatomic and biological structures for a better clinical diagnosis. Modelling includes extraction of, both, the geometry (contour segmentation and shape description) and dynamics (tracking of the movement or deformation) of the organ or cell under study. Visualization focuses on the development of virtual environments providing efficient manipulation of the computational model at local and remote (via internet) level.

4.1.24 Interactive Coding of Images (GICI)

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DEPARTMENT GROUP ATTACHED TO: Information and Communications Engineering

KEY WORDS:

- Source data coding / Data Compression / Remote sensing data compression
- Interactive data transmission
- Coding Standards (JPEG2000, CCSDS,..)
- Transform-based and prediction-based coding techniques, quantization, entropy coding

RESEARCH AIMS:

The main objective of GICI research group is the study, design and implementation of data compression techniques and standards and their application in different scenarios. Both theoretical-oriented and application-oriented investigations are performed. The research group has proposed several state-of-the-art transform-based and prediction-based coding techniques for lossy, lossless, and near-lossless compressions.

GICI has also contributed to the development of coding standards, most notably for remote sensing data compression along with the Working Group on Multispectral & Hyperspectral Data Compression within the Consultative Committee for Space Data Systems (CCSDS). GICI research group collaborates with other national and international groups on the development of new techniques to achieve better coding performance without increasing the computational complexity and while keeping several beneficial sorts of scalability.

The goal of the group is threefold: 1) to improve and advance the scientific knowledge ; 2) to transfer technological results to interested partners ; 3) to publish and present the scientific output at the most reputed venues.
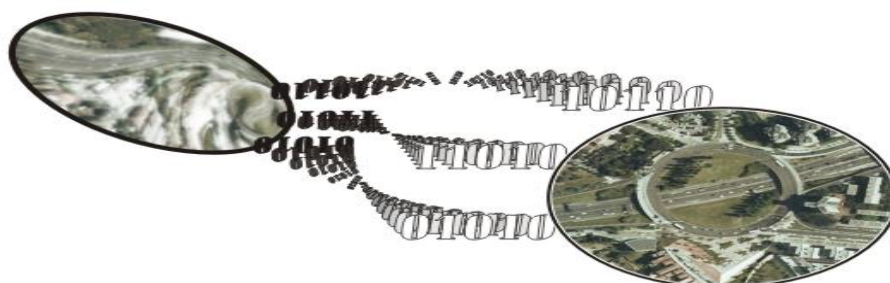

Figure. Efficient interactive transmission of data asks for compression through coding techniques that support scalability in the spatial, spectral, temporal and quality resolutions.

4.1.25 Machine Vision

RESEARCH GROUP DIRECTOR: Dr. Francisco Javier Sánchez
MEMBERS: 5
WEBSITE: http://mv.cvc.uab.es
DEPARTMENT GROUP ATTACHED TO: Computer Science – Computer Vision Center

KEY WORDS:

- Computer Vision

- Artificial Intelligence

- Computer Science

RESEARCH AIMS:

The group on Machine Vision (MV-CVC) is interested in the latest aspects of research in the area of Computer Vision and Machine Learning. The main lines of work are related to the implementation of real-time working applications for different domains, such as Medical Imaging, Visual Quality Assessment and Industrial Vision, among others, in which MV-CVC has a long experience. The Group's current projects are divided into two complementary areas, namely: basic and oriented research projects and technology transfer projects.

Basic and Oriented Research
- Image processing and segmentation.
- Blob detection, feature detection and description.
- Appearance and Perceptual modelling.
- CV Apps for Mobile devices for real time applications.

Technology transfer
The main characteristics of the projects in which the MV-CVC group is involved imply constraints related to real-time functioning and robust performance. These solutions have been implemented for leading manufacturers of different areas.
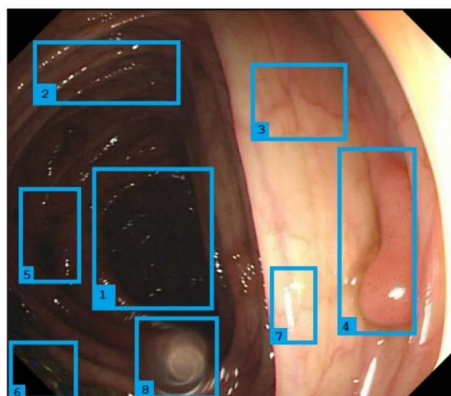
## 4.1.26 Microwave, Metamaterials and antenna engineering group

RESEARCH GROUP DIRECTOR: Dr. Ferran Martín Antolin

MEMBERS: 14

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E-MAIL: ferran.martin@uab.cat

DEPARTMENT GROUP ATTACHED TO: Electronics Engineering

KEY WORDS:

- Microwaves and millimetre waves

- Metamaterials

- Passive microwave components, Microwave filters

- Reconfigurable devices , RF/microwave sensors

- Radiofrequency Identification (RFID), Antennas

RESEARCH AIMS:

Miniaturisation and optimisation of microwave and millimetre wave circuits for communications applications based on innovative design strategies (metamaterials, electromagnetic crystals, etc). Automatic synthesis of planar RF/microwave components. High performance antennas for application in RFID tags and readers. Chipless RFID. Metamaterial-inspired structures for the implementation of angular velocity and position sensors (e.g. application to satellite positioners) and permittivity detection (e.g. application to biochemical analysers)
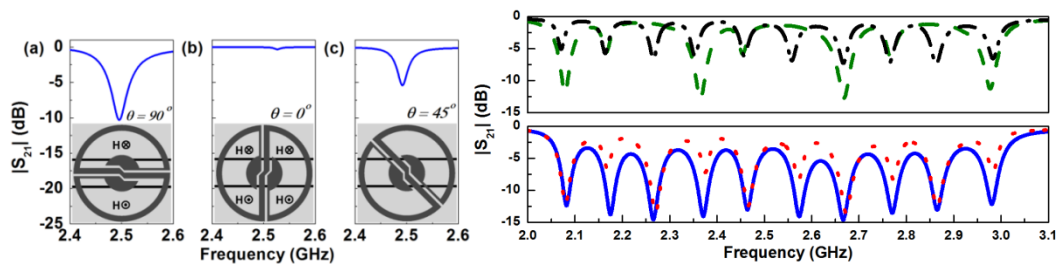
Chipless RFID tag (1 resonator) with 3 states per resonator (a)-(c). Code 10-resonator tags responses
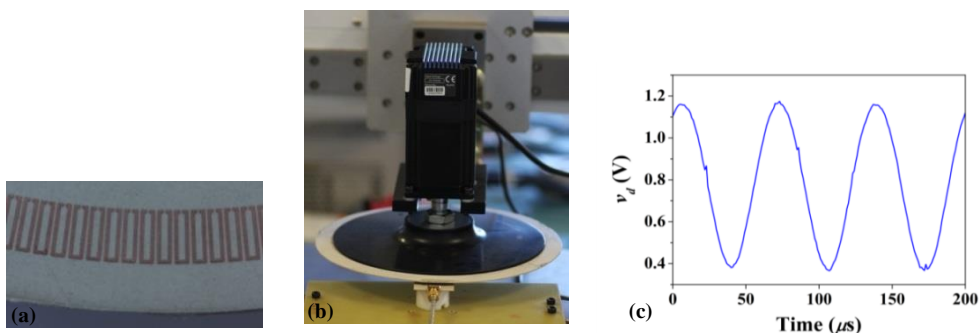
Microwave encoder (angular velocity sensor) based on an array of resonators (a), experimental set-up (b) and response (c). Angular velocity measure is based on the distance between pulses.

4.1.27 Modelling and Simulation of Logistical Systems

RESEARCH GROUP DIRECTOR: Dr. Miquel Angel Piera Eroles

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DEPARTMENT GROUP ATTACHED TO: Telecommunications and Systems Engineering

KEY WORDS:

- Modelling and simulation of dynamic systems. Optimisation of productive and logical systems.

- Decision-making tools.

RESEARCH AIMS:

The research activity of this group is centred on the development of modelling and optimization methodologies for logical systems. Our aim is to work with the use of models formalised in the Coloured Petri Nets, to evaluate the possible alternatives for production generated by optimisation methods based on Constraint Logical Programming (CLP), to find a feasible solution that complies with all the contraints imposed both by the production architecture (layout) and the deadlines established by the end client, thereby limited situations to be evaluated until an optimum solution can be found that will enable improvements in the competitiveness of the company. in order to guarantee technological transfer carried out in industry, work will be done on distributed simulation environments to evaluate a greater number of situations in a shorter period of time (distributed simulation) and apply optimisation techniques to each of the subsystems and also to the coodinatin of the overall supply chain. The scientific objectives are:

1. **integration of Simulatio Models with optimisatio Methods in CLP:** Time constraints for a series of activities, as well as the contraints that appear when assigning tasks to shared resources (e.g. CNC machines) are formalised correctly in the CPN both as preconditions for the transitions (events), arc functions, and as guards associated to the transitions.

2. **heuristic methods for exploring the space-states of simulation models:** The space-state of a simulation model for a real logistical system may require memeory and time resources that are prohibitive. The results generated by the CLP allow the path of the cover tree to be guided, considerably simplifying the nuber of possible solutions to be evaluated. However, since the CLP model is a simplified representation of the system, for the same state there may be several transitions activated that could be released in accordance with a planning algorithm generated by the CLP.

3. **Distributed Simulation:** The decomposition of a logistical production and/or transport system into subsystems where interaction can be described in a small number of events, considerably facilitates the modelling, analysis and improvement of both each of the subsystems and the system as a whole, with the possibility of incorporating partial optimisation methods.

4.1.28 Nano-optoelectromechanical systems for energy laboratory

RESEARCH LABORATORY DIRECTOR: Dr. Gabriel Abadal Berini

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**DEPARTMENT GROUP ATTACHED TO:**   Electronics Engineering

KEY WORDS:

- Mechanical vibrations energy harvesting
- Electromagnetic radiation energy harvesting
- Non-linear M/NEMS wide band energy harvesting
- Nanomechanical energy storage
- M/NEMS based wireless energy transfer
- Energy harvesting based on piezoelectric 2D materials

RESEARCH AIMS:

NANERG LAB activities are oriented to investigate the possibilities offered by NOEMS devices as transducer element in the energy harvesting, transfer and storage processes at the nanoscale. In particular, the interest of NANERG LAB is to explore the multi-domain transducing capabilities of NOEMS elements that allow them to convert the energy from multiple sources into the mechanical and, ultimately, into the electrical domain. The expertise and facilities of the laboratory are mainly restricted to the mutliphysics modelization and experimental characterization of proof of concept prototypes.

The long term objective of the laboratory is to demonstrate that NOEMS technology will play an important role in the development of the future selfpowered devices and Zeropower technologies in general. For this purpose, NANERG LAB actively participated in the genesis of the EU Zeropower initiative (http://www.zero-power.eu/) and is still connected to the growing community built around the Energy-aware ICT's (http://www.ict-energy.eu/).
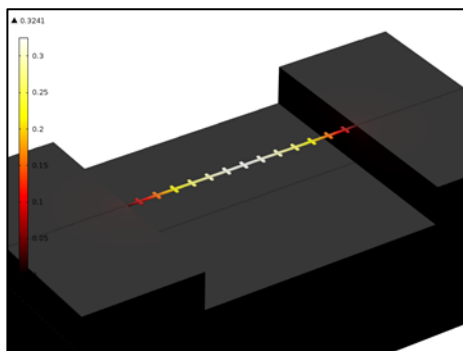
Left: NOEMS device based on an array of optical nanoantennas integrated in a clamped-clamped nano-beam. **Right:** An optical setup fully developed in the NANERG LAB is used to validate experimentally the performance of the NOEMS devices and others designed in the laboratory.

4.1.29 NeuroComputation and Biological Vision Team

RESEARCH GROUP DIRECTOR: Dr. Xavier Otazu
MEMBERS: 6
WEBSITE: **http://www.cvc.uab.es/neurobit**

DEPARTMENT GROUP ATTACHED TO: Computer Science – Computer Vision Center

KEY WORDS:

- Computer Vision

- Artificial Intelligence

- Visual Perception

- Computer Science

RESEARCH AIMS:

The NeuroComputation and Biological Vision Team (NeuroBiT) conducts fundamental, experimental and computational modelling research on the mechanisms of human visual perception. It addresses problems by combining both, computational modelling tools and psychophysical experimentation.

Recent research lines of our members, who are also members of Color in Context (CiC) Catalan Consolidated Group, have been focused on the study of processes such as colour perception (categorization, chromatic induction and colour constancy), visual discrimination, high dynamic range visualization techniques; visual saliency, and applications to perceptual image compression and image quality. Most of our past research experience and background involves the development of high-level biologically-inspired computational models whose fundamentals are firmly grounded on psychophysical studies of human perception. Our present interest also includes the definition of biologically-plausible, mid-level architectures which simulate the network dynamic characteristics of the human visual cortex and the use of computational learning techniques to map the output of our models to complex phenomena. Our final objective is to apply our knowledge to solve important Computer Vision problems and provide some answers to medical and biological questions.

4.1.29 NeuroComputation and Biological Vision Team

4.1.30 Reliability of Electron Devices and Circuits

RESEARCH GROUP DIRECTOR:	Dr. Montserrat Nafría Maqueda
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E-MAIL:	montse.nafria@uab.cat
DEPARTMENT GROUP ATTACHED TO:	Electronics Engineering

KEY WORDS:

- Nanoelectronics

- Reliability, circuit reliability simulation

- Compact modelling of aging mechanisms

- Graphene-based devices, resistive Switching devices, neuromorphic computing

- AFM, C-AFM

RESEARCH AIMS:

REDEC's research is focused on the reliability and variability of CMOS nanoelectronic devices, emerging devices and integrated circuits. Electrical characterization and modelling of the device time-dependent variability in these technologies is carried out adopting a multilevel scale, covering from the nanoscale to the device and circuit levels. The aim is the development of physics-based compact models for the reliability circuit simulators required in the Design-for-Reliability context. This approach is extended to other emerging nanoelectronic devices, as Resistive Switching and graphene based devices.
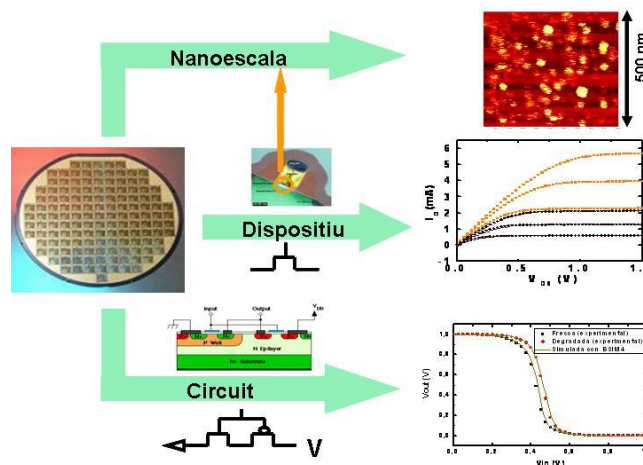
The aging mechanisms of advanced CMOS and emerging devices, which determine the reliability of nanoelectronic Integrated Circuits, are analysed at three levels: nanoscale, device and circuit. The nanoscale analysis (top) allows to detect local variations in the device electrical properties, which could affect the performance of the device. As a consequence of aging, the device output characteristics are modified (middle) and shifts in the output characteristics of the integrated circuit are observed, worsening its performance (bottom).

4.1.31 Security of Networks and Distributed Applications

Security of Networks and Distributed Applications

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DEPARTMENT GROUP ATTACHED TO:	Information and Communications Engineering

KEY WORDS:

- Routing and security for Opportunistic Networks, Delay and Disruption Tolerant Networks

- Distributed secure services and applications, Internet security and privacy protection

- Bitcoins and cryptocurrencies

RESEARCH AIMS:

The research undertaken by the SeNDA group is focussed on all aspects of network and distributed application security, paying spacial attention to non-contemporaneous communications. The main application domains the group is currently using for an applied research include vehicular networks, the medical domain, aerial communications, smart cities, and rural communications.

Since its beginnings, the group has always participated in European and national projects in topics related to security and the application of research to the community's requirements: electronic voting, trust infrastructures, eBusiness, and eHealth applications, among others. Mobile Code technology has been one of the group's most important research lines, in which important results have been achieved, such as the participation in the definition of agent standards (IEEE-FIPA), breakthroughs in agent protection mechanisms (Self-Protected Mobile Agents), and a reference implementation of inter-platform agent mobility (JaDE).

The group has participated in many projects with industry, and has produced several patents, all of this showing a clear and strong commitment towards a university-industry technology transfer. The quality of the SeNDA group research is underpinned by the considerable number of publications in prestigious journals and granted projects.

4.1.32 Signal Processing for Communications and Navigation

RESEARCH GROUP DIRECTOR: Dr. Gonzalo Seco Granados

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WEBSITE: http://spcomnav.uab.cat

DEPARTMENT GROUP ATTACHED TO: Telecommunications and Systems Engineering

KEY WORDS:

- Statistical and array signal processing

- GNSS, Galileo, GPS: Satellite-based and terrestrial positioning systems

- 5G wireless communications systems, massive MIMO and millimeter-wave systems.

- Smart cities, smart positioning, joint communication and positioning systems.

- Future internet, Cloud-based positioning

RESEARCH AIMS:

The SPCOMNAV group carries out fundamental research on statistical signal processing including estimation and detection theory. The group applies this fundamental knowledge to real-life applications at the intersection of signal processing and wireless communications, such as positioning and navigation systems, digital communications, signal integrity and quality monitoring, intelligent transportation systems and next-generation mobile networks.

One of the key research lines of SPCOMNAV is the interplay between positioning and communication systems. In particular, contributing to a paradigm shift in the way current wireless infrastructures and positioning systems are understood today. Our research exploits the bi-directional synergies between location-aware communications and communication-aware positioning. Our group plays a prominent role in next generation GNSS systems and receivers, improving their robustness, adaptability and sensitivity, extending the range of scenarios where they are available, delivering service guarantees at signal level, and providing solutions for GNSS processing in the cloud. In this context, SPCOMNAV is a world-renowned research group in GNSS signal processing, and it enjoys a privileged place the new era of secure and authentic GNSS positioning.

SPCOMNAV is present in the design of positioning services within 5G, in particular exploiting novel technologies such as massive MIMO and mm-W. The research group contributes to the design of resource allocation and cooperation mechanisms at lower layers in order to make the concept of joint communication and positioning systems are reality. The activities of SPCOMNAV have direct applicability in the context of smart cities, intelligent vehicles and V2x networks.

The group is committed to the publication of the research results with the highest standards and to an intense technology transfer activity through the participation international and industrial projects.

4.1.33 Software-Hardware Agent-based Distributed Embedded System

RESEARCH GROUP DIRECTOR:	Dr. Lluís Ribas Xirgo
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WEB:	http://shades.uab.cat
DEPARTMENT GROUP ATTACHED TO:	Microelectronics and Electronic Systems

KEY WORDS:

- Distributed systems, electronic systems, embedded systems, multi-agent systems, multi-robot systems, physical agents, robotics
- Assistive technologies, smart environments

RESEARCH AIMS:

The mission of this group is to set up a framework for the development of embedded systems' applications, such as automated transportation by mobile robots and ambient assisted living. The focus of our research is on methodological aspects of transportation systems' development process as well as of development of assistive systems based on commoditized items.

The main goals of our research are:

- To have a rapid development methodology for controllers of internal transportation systems of small and medium-size workshops and warehouses
- To provide system developers with the tools (design templates, models, algorithms, prototypes, *et cetera*) that support the proposed methodology
- To help people with disabilities by assistive systems
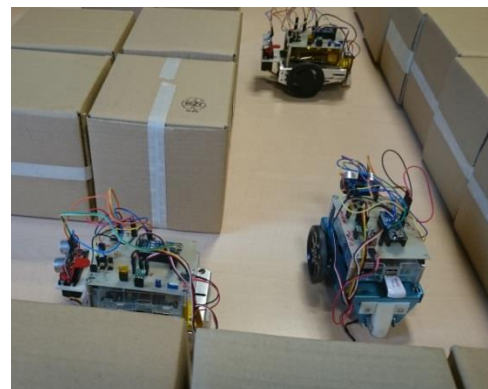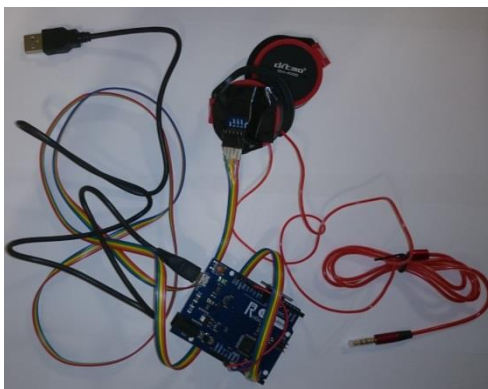
Examples of research products: An earphone-mounted mouse for hands-impaired people (left) and a small-scale transportation system prototype (right).

4.1.34 Sustainability and Environmental Prevention

RESEARCH GROUP DIRECTOR:	Dr. Xavier Gabarrell Durany
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E-MAIL:	xavier.gabarrell@uab.cat
WEB:	http://www.sostenipra.cat
DEPARTMENT GROUP ATTACHED TO:	Dept. Chemical, Biological and Environmental Engineering, and Institut de Ciència i Tecnologia Ambientals. *Unidad de excelencia «María de Maeztu» (MDM-2015-0552)* (ICTA)

KEY WORDS:

Ecodesign, edTOOL, LCA, industrial ecology, Sustainability of agricultural systems, Flow and waste analysis,CO2ZW, Plugrisost, Fertile city, circular economy, greenhouse gas emissions.

RESEARCH AIMS (2014- SGR-1412):

The objectives of the Sostenipra are to develop and apply tools for the sustainability and environmental protection. These tools within the Industrial Ecology framework are Life Cycle Analysis (LCA), ecodeisng, ecoefficiency, analysis of material and energy flows, eg, applied to industrial, urban and agricultural systems, on a process and product, local, regional and national scale. Sostenipra is **one of the leading research groups in the world** of **Life Cycle Analysis**, based on the bibliometric analysis of LCA published in The International Journal of Life Cycle Assessment April 2015; as well as in the **Industrial Ecology** field (Collaboration patterns in industrial ecology research: 2015 update, Jonathan S. Krones, on ISIE 2015, UK,).

Sustainable food production in cities: Urban areas use nearly 70% of energy and are responsible for 75% of world GHG; they are strongly dependent on food and water, and this makes them vulnerable and responsible for high environmental impacts. This research line is aimed to give response to the challenge of food security and quality in cities through sustainable food production and enhanced quality. It also applies to the societal challenge of energy security and global change through energy efficiency in buildings, CO2 sequestration and emission reductions associated to food transportation. It's focused on a new horticultural production system based on multy-disciplinary tools (such as LCA, LCC, energy efficiency and Multi-scale integrated analysis of societal and ecosystem metabolism, MuSIASEM). The group has the first Roof Top Greenhouses (RTG) integrated within a building (http://fertilecity.com/), sharing flows such as energy and water.

Urban furniture ecodesigned by the group and exhibited at CosmoCaixa:ecolamppost and bicycle park

4.1.35 Wireless Information Networking

RESEARCH GROUP DIRECTOR:	Dr. Jose Lopez Vicario
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DEPARTMENT GROUP ATTACHED TO:	Telecommunications Systems Engineering

KEY WORDS:

- Wireless Networks: Wireless Sensor Networks, Vehicular Networks.

- Internet of Things, Smart Cities, eHealth, Industrial Internet.

- Data Mining, Real Time Analytics.

RESEARCH AIMS:

- **Sensor data fusion:** to develop data fusion mechanisms based on data coming from sensors networks. The aim is to obtain added value data by exploiting the knowledge of the special characteristics of these networks and the nature of the data they produce.

- **Network information management:** to implement network data management strategies based on the optimization of sensor networks and sensor to the Cloud network deployments (energy, delay and transportation cost minimization).

- **Data mining in sensor networks:** to develop pattern recognition mechanisms based on the application of machine learning mechanisms to data coming from wireless networks.

- **Real time Data Analytics:** to propose data analytics mechanisms efficiently optimized and parallelized to process sensor data in real time.

4.2 Institutes and Research Centres

Around the School of Engineering, there have been installed a set of institutes and research centers, consortia with the Government of Catalonia, or centers of the CSIC (*Centro Superior de Investigaciones Científicas,* spanish research council) engaged in different fields of engineering. The School of Engineering, through the participation of teachers in the School attached to these centers, or through the collaboration of research groups with these centers remain a very important link that improve the quality of teaching, taught in the school.

List of Institutes and Research Centres linked to the School of Engineering:

1. Artificial Intelligence Research Institute - IIIA (CSIC)
2. Barcelona Institute of Materials Science - ICMAB (CSIC)
3. Catalan Institute of Nanoscience and Nanotechnology - ICN2 (CSIC)
4. Computer Vision Center – CVC (UAB - GC)
5. Institute of Environmental Science and Technology - ICTA (UAB)
6. National Microelectronics Centre - CNM-IMB (CSIC)
7. Space Studies Intitute of Catalunya - IEEC (CSIC)

4.2.1 Artificial Intelligence Research Institute IIIA (CSIC)

CENTRE DIRECTOR: Prof. Carles Sierra García
TELEPHONE: 34 93 580 9570
ADDRESS: UAB Campus, 08193 BELLATERRA (Barcelona)
E-MAIL: info@iiia.csic.es
WEB: www.iiia.csic.es

DESCRIPTION OF CENTRE: The IIIA is a research centre, belonging to the Spanish Council for Scientific Research (CSIC). It is rooted in the research group on Artificial Intelligence and Logic of the Centre of Advanced Studies of Blanes created in 1985. IIIA is celebrating its 25th anniversary in 2019 and currently has around 50 full-time researchers and engineers, including 12 PhD students. Its mission is to carry out very high quality research in AI keeping a good balance between basic research and applications, and paying particular attention to training PhD students and to technology transfer. Since 1987, the IIIA scientists have supervised nearly 100 PhD students.

The IIIA has three departments: Reasoning and Logic; Learning Systems; and multiagent systems. IIIA's research theoretical results are applied to many domains. The main ones are electronic markets, education, medicine, and music. These research activities have been funded by more than 100 projects obtained through competitive funding from the European Union (more than 20 projects) and the Spanish National Research Plan (more than 50 projects). The total funding obtained since 1985 exceeds 20 million Euros.

IIIA researchers in these fields have chaired leading conferences in Artificial Intelligence (IJCAI, ECAI, and AAMAS); and are members of the board of the main journals as editor-in-chief (Fuzzy Sets and Systems, Journal on Autonomous Agents and Multiagent Systems) associate editor (AI Journal, JAAMAS, JAIR, etc.) and organizations (IJCAI Board of Trustees, IFAAMAS Board, etc.). The IIIA has produced and produces significant scientific publications (more than 2500 papers since 1985) many of them have been, and are, highly cited.

4.2.2 Barcelona Institute of Materials Science ICMAB (CSIC)

CENTRE DIRECTOR:	Prof. Xavier Obradors Berenguer
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ADDRESS:	UAB Campus – 08193 BELLATERRA (Barcelona)
E-MAIL:	director@icmab.es
WEB:	www.icmab.es

DESCRIPTION OF CENTRE: The Institute of "Ciencia de Materiales de Barcelona" (ICMAB) is a research center which depends on the Consejo Superior de Investigaciones Científicas (CSIC) and is governed by a Foundation board. The Institute was set up in 1986 and subsequently, in April 1991, the laboratories were opened on the campus of the Autonomous University of Barcelona UAB. In 1998 the centre was added to and a new floor was built. In 2015 has been awarded with the Severo Ochoa label of excellence.

The aim of the institute is to carry out research aimed at obtaining and characterising materials of industrial interest. Its activities are based on the synthesis, preparation, crystallization and characterisation of functional high-performance materials and nanomaterials which in some cases have led to the construction of device prototypes based on these materials. Studies and improvements are made for inorganic materials as well as for new molecular and supramolecular materials with attractive functional properties (magnetic, superconducting, electronic, electric, chemical). These materials are being developed through research projects and research contracts.

To develop these activities, at present there are 86 permanent staff among researchers and support personnel, together with 112 non-permanent staff, divided into eight Research Groups, one general unit service, and one unit of Scientific and Technological Services. We have one of the highest number of ICREA Professors (10% of our permanent staff), a prestigious permanent position within Catalonia, demonstrating the strong attractiveness of ICMAB. During 2015, 209 articles included in the SCI were published at the ICMAB. Each permanent researcher publishes close to 4 articles per year in Journals with a very high impact factor (IF ICMAB ~ 5,8). The competitive funds obtained by researchers are in close proximity to the 50% of the total budget of the ICMAB-CSIC.

## 4.2.3 Catalan Institute of Nanoscience and Nanotechnology ICN2 (CSIC)

CENTRE DIRECTOR :   Dr. Jordi Pascual Gainza

TELEPHONE: 34 93 581 4408

ADDRESS: Block CM7 – UAB Campus – 08193 BELLATERRA (Barcelona)

E-MAIL: icn@uab.cat

WEB: www.nanocat.org

DESCRIPTION OF CENTRE: Nanoscience is not revolution of concepts- as we experienced at the beginning of the last century with the birth of the theory of relativity and quantum mechanics. Nanoscience is a revolution of phenomena. Two basic aspects have provided the base for the research of the nanoworld: the low dimensional scale of objects at nanometer level and the relevance of surface effects, where the understanding and control of self-assembling nanostructures is one of the most interesting challenges today. I do believe that the study of nanotechnology will lead the way to a second post-industrial revolution.

At the end of the last century an explosion occurred in the research and application of materials and structures under nanometric control. The results of these efforts have already had, and will continue to have, an enormous impact on all ambits of society.

The ICN2 is focused on theoretical study, experimental observation and control of matter at the nanometric scale, synthesis and fabrication, functionalization, characterization and applications of nanoparticles and carbon nanotubes and the development of nanosensors. A significant part of our research will also be devoted to societal demands and strategies that implicate metrology, instrumentation, energy and the environment. The ICN2 also has a commitment to the university environment in which it is located. We will be involved in the training of students and industrial doers and participate in masters and PhD courses in order to contribute to the spread of knowledge.
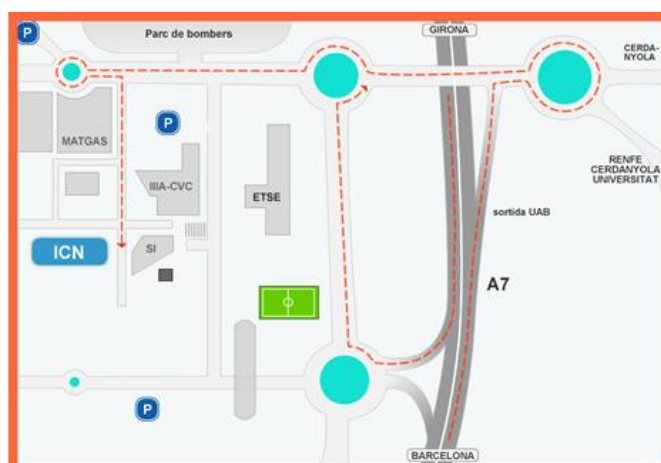
4.2.4 Computer Vision Centre – CVC (UAB – GenCat)

CENTRE DIRECTOR :	Dr. Josep Lladós Canet
TELEPHONE:	34 93 581 1828
ADDRESS:	Block O – UAB Campus – 08193 BELLATERRA (Barcelona)
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WEB:	http://cvc.uab.cat

DESCRIPTION OF CENTRE: The CVC is a non-profit research center with an independent legal status, established in 1995 by the Generalitat de Catalunya and the Universitat Autònoma de Barcelona (UAB). Our mission is to carry out cutting-edge research that has the highest international impact in the field of computer vision. We also promote the transference of knowledge to industry and society. Finally, we strive to prepare and form researchers of the highest European level.

The CVC has positioned itself as a specialist in the field of computer vision and is considered a reference in the creation of knowledge towards society. Computer vision is a transversal technology with a wide array of possible applications including but not limited to: biomedicine, mobility, security, production, society, media, etc.
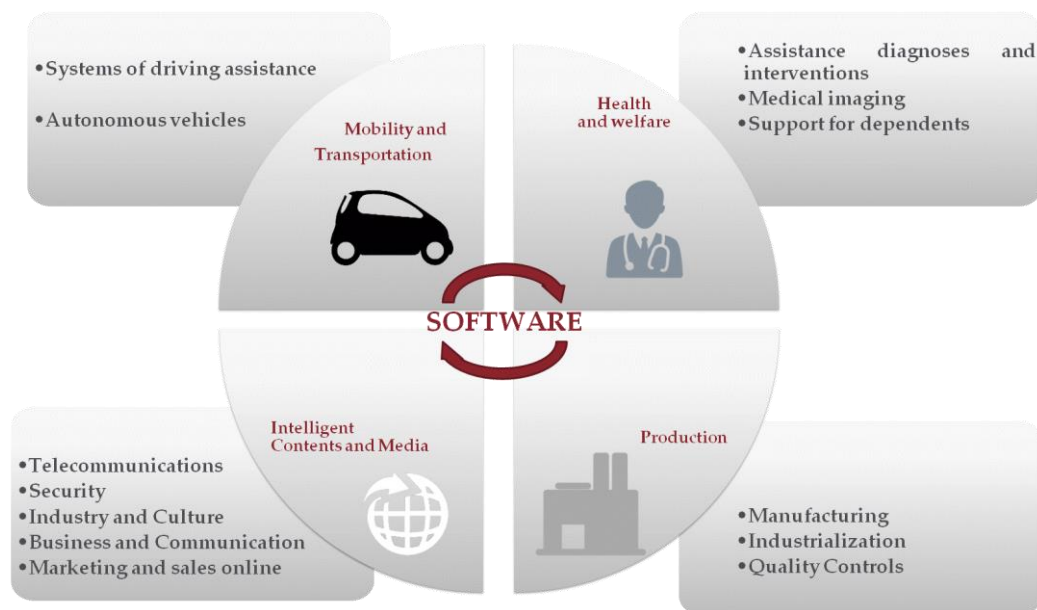
CVC's personnel who perform research activities are not only composed by researchers hired by the CVC, but also by university professors, mainly belonging to the Computer Science Department of the Universitat Autònoma de Barcelona. In addition, CVC researchers also collaborate in teaching tasks at the Computer Science Department of the UAB and supervise PhD theses of the Computer Science program of UAB Engineering School.

In this sense, the relationship between the CVC and the Computer Science Department of the UAB is very tight and the scientific and transfer production of both entities can be considered the same.

4.2.5 Institute of Environmental Science and Technology ICTA (UAB)

CENTRE DIRECTOR :   Dr. Jordina Belmonte Soler

TELEPHONE: 34 93 586 8778

ADDRESS: Edifici Z, Carrer de les Columnes, s/n, UAB Campus – 08193

BELLATERRA (Barcelona)

E-MAIL: icta@uab.cat

WEB: http://www.uab.cat/icta

DESCRIPTION OF CENTRE:

ICTA's mission is to promote and conduct research, train researchers who can contribute to our understanding of environmental problems and their solutions, and meet the challenges posed by the interaction between society and the environment. ICTA's is becoming one of the leading European centres in environmental studies, distinguished by its international focus, multi-disciplinary base and cooperation between the various stakeholders within the framework of sustainability-based social and civil responsibility.

In 2015 ICTA received a prestigious national award as a Unit of Excellence 'Maria de Maetzu' from the Spanish Ministry of Economy and Competitivity (MINECO). This programme will run from 2016 to 2019 with a financial support of 2M€ and is focussing on the many scientific and societal challenges related to climate and global change.

ICTA was created with the following objectives: (1) To be a space for exchange and debate by researchers from different disciplines; (2) To encourage and promote interdisciplinary research in environmental sciences jointly with the various departments and research groups involved; (3) To foster research programmes covering different aspects of the environment and related topics; (4) To collaborate in environmental science training programmes, and coordinating and promoting doctoral studies; (5) To act as a bridge between the university and the society, and to encourage and promote dialogue and thought about the natural environment; and (6) To offer a basis for technical and scientific counselling, as well as for environmental policy and management at different scales.

The pervasive nature of many environmental problems and the various implications of effective policy responses require a research approach that integrates all areas of society and learning.

ICTA's research spans across three broad scientific areas, namely "earth and life sciences", "social environmental sciences" and "technology, environment and society". In turn, each of these encompasses a number of research groups (of at least 5 researchers) focused on particular themes and novel topics.

4.2.6 National Microelectronics Centre – CNM-IMB (CSIC)

CENTRE DIRECTOR : Dr. Francesc Serra

TELEPHONE: 34 93 594 7700

ADDRESS: UAB Campus – 08193 BELLATERRA (Barcelona)

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WEB: www.cnm.es

DESCRIPTION OF CENTRE: Centro Nacional de Microelectrónica (**CNM**) is the largest public microelectronics research and development centre in Spain. It belongs to the spANISH National Research Council (CSIC) and is managed by a Board of Trustees. Founded in1985, **CNM** is at present constituted by three Institutes:

- Instituto de Microelectrónica de Barcelona, **CNM-IMB**
- Instituto de Microelectrónica de Madrid, CNM-IMM
- Instituto de Microelectrónica de Sevilla, CNM-IMSE

Researchers and engineers develop process technologies focused toward microsystems, power devices and systems, chemical transducers, nanotechnologies, biomedical applications, and electronic design of IC and systems.

4.2.7 Space Sciences Institut of Catalunya – IEEC

CENTRE DIRECTOR : Dr. Ignasi Ribas Canudas

TELEPHONE: 34 93 280 2088

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WEB: www.ieec.cat

DESCRIPTION OF CENTRE: The IEEC (Institut d'Estudis Espacials de Catalunya) is a research institute that studies all areas of space and space sciences, including astrophysics, cosmology, planetary science, Earth observation, and space engineering. Its mission is to push the frontiers of space research from the scientific and technological domains for the ultimate benefit of society.

The institute is an institute of the Government of Catalonia research whose patterns the Department for Innovation, Universities and Enterprise (DIUE), the (Catalan Foundation for Research Innovation (FCRI), the University of Barcelona (UB), the Consejo Superior de Investigaciones Científicas (CSIC), Autonomous University of Barcelona (UAB) and the Technical University of Catalonia (UPC) and the participation of researchers and support staff of these organizations through four units, two of them with their Campus Server:

- Cosmo Science Institut (ICC) of UB, in Barcelona.
- Space Sciences Institut (ICE) of CSIC in Bellaterra.
- Center of Space Studies and Researchde (CERES) of UAB in Bellaterra.
- Centre of Aeronautic and Space Research (CRAE) of UPC in Barcelona.

The Science and Technology Council is an advisory body according to the Institute of Space Studies of Catalonia, which ensures the quality of research work. It is composed of renowned scientists and technologists in the scientific, cultural, economic and social development. The functions of the Scientific and Technological Council are advisory and consultancy regarding all matters affecting the objectives of the institute. In particular, the opening of new research programs, the continuation of existing and addition of new staff scientist at the institute.
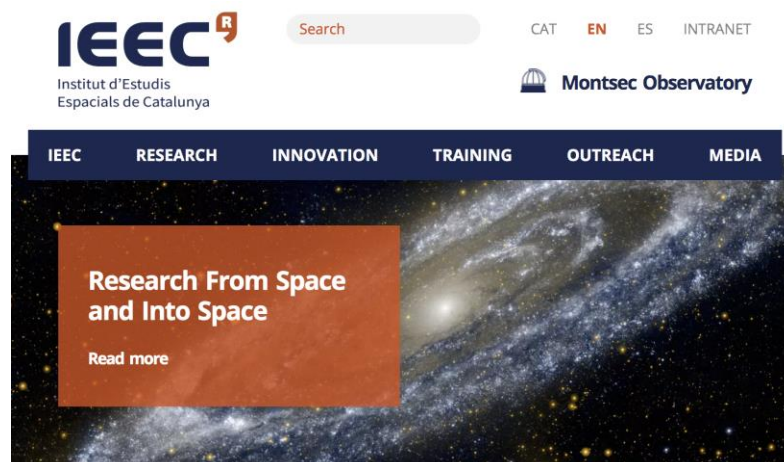
5. Public Promotion and Students Mobility

The School of Engineering organizes during each academic year several promotion activities addressed to students and academic staff. The aim is to build a young, dynamic and professional environment for organizing all types of events: symposiums, conventions, meetings, social functions, summer camps and other academic celebrations. The range of promotional activities organized each year target all engineering students or rather particular groups whether international, undergraduate, postgraduate, or by subject.

In both its Bellaterra and Sabadell campuses, the School of Engineering offers every type of environment necessary for the organization of all sorts of events. Taking advantage of the existing UAB resources, engineering students will find work spaces of all sizes for courses, auditoriums and function rooms for meetings and congresses, green spaces for open air activities, installations to practice all manner of sports, areas for trade fairs and exhibitions, for concerts, for product presentations, for the making of feature films and advertisements, guest rooms, long stay apartments, shops, a diverse range of restaurants and eating places, the most avant-garde architecture and an exquisite example of modernist construction...

5.1 Promotion Activities for Future University Students

The promotion activities carried out during the academic course 2017-18 addressed to high school students in secondary institutes have been [4]:

5.1.1 Open Day Sessions (February 6-8, 2019)

During the year, the Engineering School organizes the *Jornades de Portes Obertes*, open-days where students can learn about the academic details of the engineering studies and the professional future of their careers, while visiting our premises. The sessions were aimed especially at high-school students looking for advanced vocational training, and their families.


5.1.2 FIRST Lego League (February 9, 2019)

The School hosted for the third time the qualifying match of the FIRST Lego League, an international challenge that aims to arouse the interest of young students towards science and technology. With the help of over 100 volunteers and UAB staff, the tournament was a success with the participation of 32 teams from various institutes and schools in Barcelona, who filled the School with families, children with passion for research, innovation, and robots.

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[4] *Images downloaded from https://twitter.com/Enginyeria_UAB; https://twitter.com/enginyeriauab; http://blog.enginyeriauab.cat/; and http://www.albertgilopez.es*
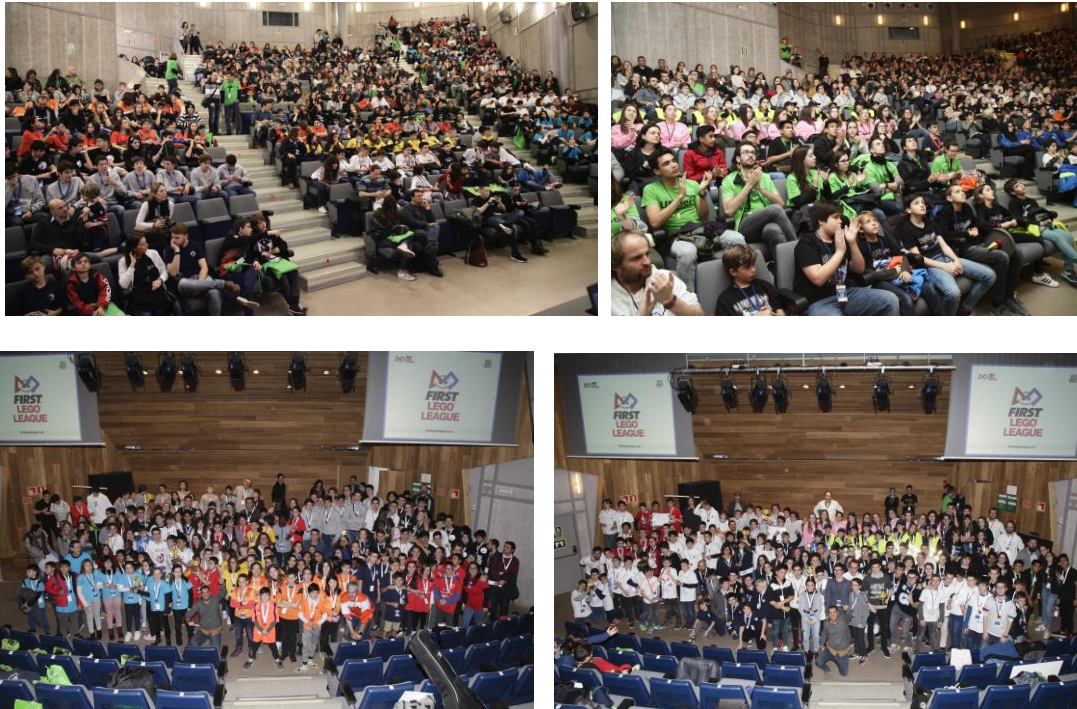
### 5.1.3 YOMO - Mobile World Congress (Feb. 25 - 28, 2019)

The School of Engineering participated with its own stand in the YOMO (YOuth MObile) Festival, held as part of the GSMA Mobile World Congress at Fira Montjuïc Fair in Barcelona. The YOMO is an STEAM (Science, Technology, Engineering, Art, and Math) activity where students can experience surprising science and technology. The School's Students belonging to the Physical Computing Club shared their collection of robots based on AI with more than 15,000 attending students, between 10 and 16 years.
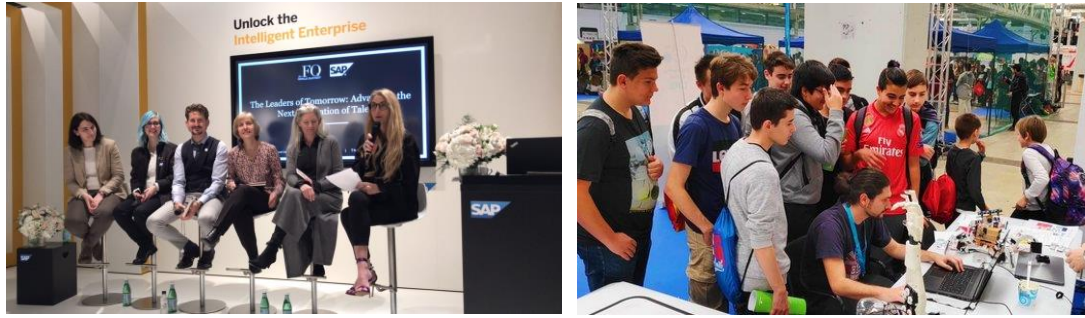
5.1.4 Education Fair (March 20-24, 2019)

The *Saló de l'Ensenyament* held in the framework of the *Training and Work Week* at Fira de Barcelona, is the greatest events on university education, during which the Masters degrees and Postgraduated courses of the School of Engineering are also promoted.
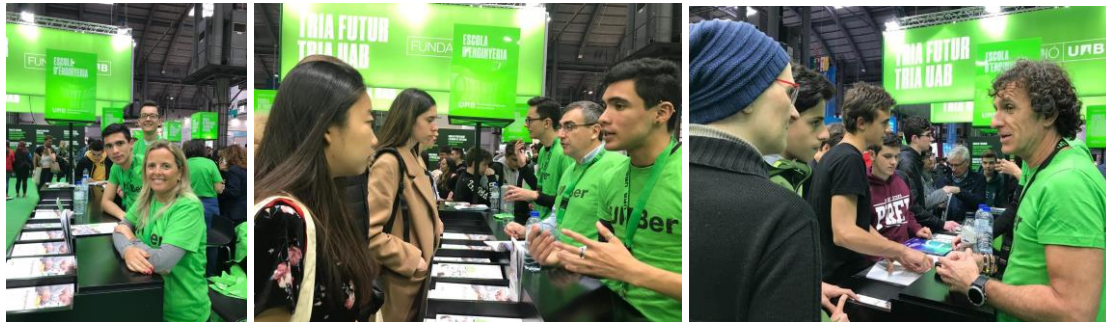
5.1.5 Family Days (May 4, 2019)

The *Dies de la Família* events are addressed to high-school students who next academic course will access UAB, and their families. The aim is to give them information related to the studies, services and facilities of the School of Engineering and the UAB campus.
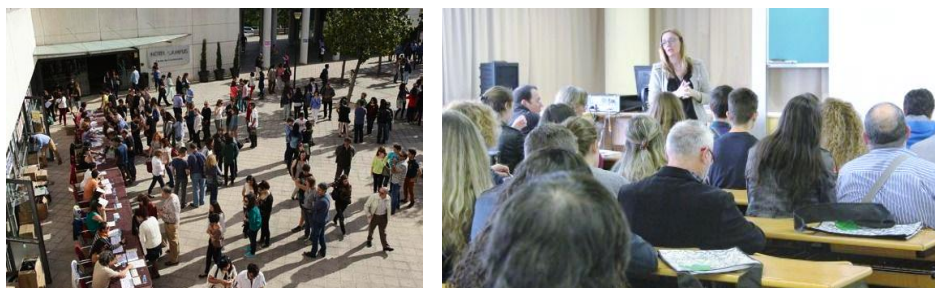
5.1.6 ARGÓ Program (February - June 2019)

The *Programa ARGÓ* is an institutional project of the UAB, as part of the actions promoted by UAB to help improving the transition of students from a Secondary Institution to a University. In addition, there are other actions of work: give research advice to high school students, allow short stages of students at UAB, schedule academic/ research placements in high schools, provide specific education skills to secondary school teachers, etc.

5.1.7 Campus Ítaca (June 25 - July 3 and July 4-12, 2019)

The Ítaca Campus is a socio-educational program of the Fundació Autònoma Solidària (FAS) which consists of a stage at the university aimed at ESO students of 3rd grade. During the months of June and July, the monitors have the objectives of encouraging the connection of high school students with the university and improving the learning capabilities of such young people once they'd finished their obligatory formative stage.

5.1.8 Visits to Secondary Schools (during whole course)

These activities are aimed at secondary school students and teachers, to encourage new vocations among engineering students. More details in: http://escolab.bcn.cat/en

5.2 Promotion Activities for University Students

The most important promotion activities addressed to or organized by the students of the School of Engineering during the academic course 2017/2018 are detailed next.

5.2.1 Engineering Welcome Day (October 11, 2018)

The Student Council of the School of Engineering organized, in conjunction with the School of Engineering, a Welcome Day for students of the School. During this day, a varied program was offered: videogame tournaments organized by GAMERS UAB, a "Human vs. Zombie" survival competition organized by *Col·lectiu HvZ*, and other activities organized by UAB Quidditch Club, Tecno UAB, Engineering Entrepreneurship Club and Alumni UAB.

5.2.2 Graduation Day (November 29, 2018)

The graduation ceremony at the School of Engineering marks the culmination of all the hard work of the students as they are formally presented with certificates and awards. The ceremony is a celebration of all of graduating students' achievements – a truly unforgettable day for them and their families. Once there, the students could catch up with fellow students and thank the University staff who have helped them with their studies. This is their special day, for savouring it and celebrate with those most close to each student.

5.2.3 Dragons UAB University Esports Tour (February 12, 2019)

University Sports is the inter-university league of computer games in Spain, and Dragons UAB is the official sport team of the UAB. Annual competitions are organized for League of Legends, Hearthstone and Clash Royale, among others. Different talks about job opportunities in the videogames industry were organized at the School of Engineering.

5.2.4 #Tecnodays UAB (First Thursday of each month, Feb-May 2019)

The different editions of the Tecnoday are focused on talks related to the use of technology in the industry. For example, Joan Cano, Network Engineer at Adamo Telecom, gave the talk "What ISP knows about me and one of Balena to play (Docker)." Adamo Telecom is a provider of Internet, landline and mobile telephony based in Barcelona that has managed to become a place among traditional operators. Also, a talk on Clean Code was given by Ramón Guimerà, a Junior Backend Engineer of Wallapop, one of the most well-known mobile apps.

5.2.5 Sant Jordi Day (April 23, 2019)

Sant Jordi´s Day, 'La Diada de Sant Jordi', is on 23rd April every year. It is also called the Feast or the Festival of St George. Sant Jordi is the Catalan name of Saint George, the patron saint of Catalonia. St Jordi's day is one of the most romantic days of the year, centred on roses, romances and books. The School of Engineering celebrated such event by reading the winners of a contest of short tales, sharing books (by bookcrossing), and sharing roses. In addition, Dr. Josep Maria Basart gave a presentation on the book: "*If this is a man*", written in 1947 by Primo Levi (1919-1987) describing his arrest as a member of the Italian anti-fascist resistance during the Second World War, and his incarceration in the Auschwitz concentration camp (Monowitz) from February 1944 until the camp was liberated on January 27, 1945.

5.2.6 #MEMEnginy19 (April 25, 2019)

The School of Engineering hosted the annual #MEMEnginy19, where students and companies can have a more direct contact through the stands that were installed in the building. The Student Council of the School of Engineering organized the event with the intention of bringing engineering students contact with businesses, innovation and research.

The School of Engineering made a presentation of its Masters and Graduate degrees, and besides this and the stands of each of the companies present in #MEMEnginy (Grifols, Clearpeaks, Boehringer-Ingelheim, Accenture, Altran, Raona, Idneo, Cognizant, Alba, Mitiga, Everis, Minsait Indra, GDG Spain, Roche, Capgemeni, Sopra Steria, SAP, Amazon, Babel, Deloitte, Wallapop, among others) there was also a wide range of seminars and conferences, like the talks "Why Cloud Matters" by Amazon, "The two faces of the digital world" by the cyber intelligence and security company Boehringer-Ingelheim, "Innovation on ADN" by Sogeti, "Building new purification plants" by Grifols, and "One Flutter to rule them all" by Wallapop, to cite but a few. In addition, a round table conference was organized with the 2 recently-granted ICREA Academia researchers of the School: Prof. Ferran Martín (Dept. of Electronic Engineering) and Antonio López (Dept. of Computer Science).

5.2.7 #TechpartyUAB (May 3-5, 2019)

The second edition of #TechpartyUAB was a success in participation, with more than 150 participants in eighty competitions and games, while attending various supplementary training activities that were carried out. The #TechpartyUAB has demonstrated the current interest, not only among University students but amon young people in general, towards the world of video games, social networks and digital innovation. The organizers of the meeting, the Student Council of the School of Engineering, in collaboration with various organizations and the Promotion Unit of UAB, highlighted the success of complementing the competitions with training seminars that attract a large number of participants.

5.3 Presence in Social Media and Promotional Newsletters

The School of Engineering has a strong presence in social media via the following links:

- Web: http://www.uab.cat/enginyeria/

- Facebook: https://www.facebook.com/enginyeriauab/

- Twitter: https://twitter.com/enginyeriauab

- Instagram: https://www.instagram.com/enginyeriauab/

- Youtube: https://www.youtube.com/channel/UC-wXQ4g2dcwarxRQwMOt5gw

In addition, a monthly newsletter has been published during the academic course 2018-19, informing about the most important news and promotion activities carried out by the School and its members. Next the reader can consult all the published newsletters.

5.4 Mobility and International Exchange Programs

With 1,383 foreign bachelor's degree students and 1,130 UAB students in mobility programmes in 2017-2018, the UAB enjoys a high rate of internationalisation in its teaching.

In the case of official master's degrees 37% of students are from other countries. Specifically, in the academic year 2017-2018 there were 1,158 foreign official graduate students taking official master's degrees. In addition, 1,376 students were in 2017-2018 at the UAB on different exchange programmes and another 3,237 were here on the Study Abroad programme, run by the Fundació UAB (FUAB), which operates independently of the exchange programmes.

In the School of Engineering, the number of undergraduate students who participated in mobility actions in the academic year 2018-2019 (before April 28th, 2019) are 40 students visiting the School of Engineering (IN) and 24 students going to other universities (OUT).

Regarding the 40 international students who have visited the School of Engineering (IN):

- 20 Erasmus+ students (11 during first semester, 9 during second semester)
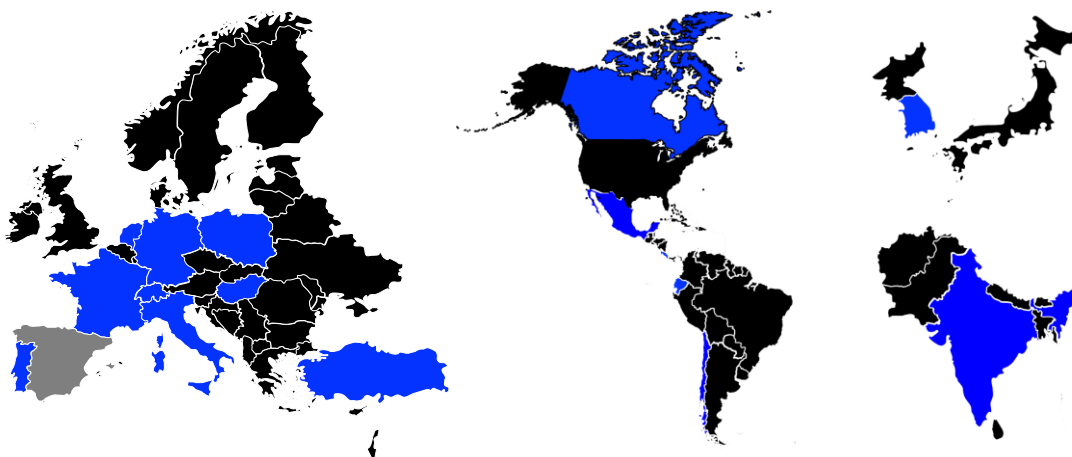- 17 UAB Mobility programme
- 3 SICUE programme

Figure: Countries from where the 40 students visited the School of Engineering.

The 24 students of the School who participated in Mobility actions (OUT) were:

- 9 from Computer Engineering, 6 from Chemical Engineering, 1 from Telecom. Systems Engineering, and 2 from Computer + Telecom. Systems participated in Erasmus+.

- 2 from Computer + Telecom. Electronic Engineering, and 2 from Computer Engineering participated in the UAB Mobility Programme

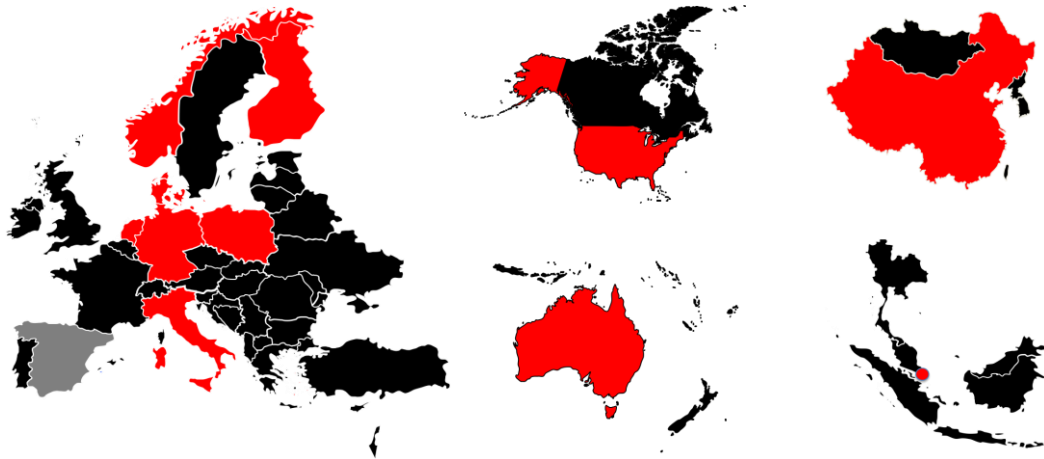- 2 Computer Engineering student participated in SICUE

Figure: Countries visited by students of the School of Engineering.

5.4.1 The Erasmus+ Programme

The Erasmus+ program is within the guidelines of the Education and Training 2020 strategy and the strategy Rethinking Education and includes all initiatives of education, training, youth and sport. In education includes all levels: academic, professional education and adult education. This program is focused in an European University (from 3 months to a whole academic year) and subsequent mutual recognition of the courses studied abroad. This recognition is done according to a Learning Agreement agreed with an exchange coordinator. The UAB has bilateral agreements with more than 500 universities of 32 countries.

Also along this path, the School of Engineering manages agreements with 60 universities across Europe within the Erasmus+ program, which allows students of the School having the opportunity to meet other realities around training and research the field of engineering, enriched by the skills provided by the internationalization of studies. Among these universities, there are in Germany (10), Austria (1), Denmark (2), Finland (4), Hungary (1), France (10), Italy (13), Liechtenstein (1), Norway (1), Netherlands (4), Poland (3), Portugal (2), United Kingdom (1), Romania (3), Sweden (1), Switzerland (1) and Turkey (2). The complete list of possible destinations for the School of Engineering can be consulted here.

For more information:
International Relations Area
Erasmus (Plaça Cívica)
Monday - Wednesday 9.30 to 1.30. Thursday 9.30 to 12 and 3.30 to 4.30. Friday 9.30 to 1.30
Tel. +34 93 581 8499
erasmus@uab.cat

5.4.2 The UAB Mobility Programme

Outside Europe, there are several countries whose universities are included in UAB Mobility programme, like Argentina, Australia, Brazil, Canada, Korea, India, Japan, the United States, Mexico, Peru, Chile and China. The complete list of possible destinations for the School of Engineering can be consulted here.

Any student wishing to do an exchange at the School of Engineering must be selected by their university of origin. They should therefore contact their university to obtain the necessary information and requisites for participating in the exchange programme.

For more information:
International Relations Area
UAB Programme
Monday - Wednesday 9.30 to 1.30. Thursday 9.30 to 12 and 3.30 to 4.30. Friday 9.30 to 1.30
Oficina de la Plaça Cívica
tel. +34 93 586 8499
internacional.propi@uab.cat

5.4.3 The SICUE Programme

Finally, there are possibilities of mobility within Spain with the SICUE program. This is a Exchange System between University and Centers of Spain (SICUE), which was created by the Conference of Rectors of Spanish Universities (CRUE) in order to facilitate the exchange of students within the Spanish State.

Through this system, students can spend part of their studies at a different university with guarantees of academic recognition and adaptation to their curricular profile. This exchange offers students the opportunity to experience different educational systems, including the system of practices, and to meet the social and cultural aspects of other Autonomous Communities in Spain. The complete list of destinations and contact coordinators per degree in the School of Engineering for the academic course 2018-2019 can be consulted here.
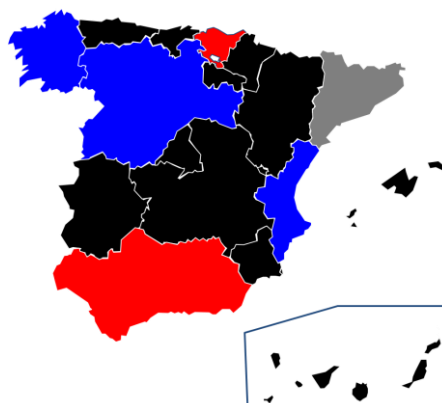

Figure: In red, Spanish regions visited by our students; in blue, regions from where students visited the School of Engineering.

6. Professional Training and Technology Transfer

Throughout the course, different talks are organized, aimed at the vocational guidance of students eminently in their third and fourth years. Several technological professional associations visit the School of Engineering to give talks and organize different activities, like:

- Col·legi Oficial d'Enginyeria Informàtica de Catalunya.
- Col·legi d'Enginyeries Tècniques i Grau en Enginyeria Informàtica de Catalunya.
- Col·legi Enginyers Industrials de Barcelona.
- Col·legi d'Enginyers de Telecomunicacions de Catalunya (CETC).
- Associació Catalana d'Enginyers (Telecos.cat).
- Col·legi d'Enginyers Tècnics i Pèrits de Telecominicacions de Catalunya (CEOTTC).

In addition, several companies came at the School invited by academic or coordination staff to give talks and seminars, like for example:

- Applus Laboratories (May 27th, 2019).
- Mitek Systems (May 23rd, 2019).
- Arista Networks (May 22nd, 2019).
- Kaspersky Lab (May 20th, 2019).
- DXC Technology (May 17th, 2019)
- Grifols (May 2nd, 2019).
- Symantec (April 25th, 2019).
- Amazon (April 4th, 2019).
- Everis (April 4th, 2019 and November 8th, 2018).
- Scytl Secure Electronic Voting (March 15th, 2019).
- KPMG (March 11th, 2019)
- Adamo Telecom (February 14th, 2019)
- Wallapop (February 14th, 2019)
- SAP (November 6th, 2018)

6.1 Professional Training Placements

At the School of Engineering, even before the introduction of the EHEA studies, the different degrees have always offered the possibility of internships in companies, as an optional fourth-year subject of of 12 ETCS equivalent to 360 hours stage at the company. The possibility of such stages at companies is very interesting for the students, due to the intrinsic applied nature of technological studies. And there is also a huge interest from companies in receiving students as a specialization stage of their training profile, while introducing them into the labor market. So this tradition of internships in companies not only continues but strengthens year after year in all the undergraduate studies.

All the placement activities at companies are prepared, managed and evaluated thanks to the figure of professional training coordinator, who in most cases is the own coordinator of the degree him/herself, in fourth year already very well-known by the students.

The informative procedure to the students is as follows. First, an informative talk is scheduled, addressed to senior students describing how this subject works and the administrative path. The announcement of this talk is announced well in advance through all the dissemination channels of the School. The organizers of these talks are indeed the coordinators of the company placements. The list of available companies is made out public via the Virtual Campus, so any student can access to the internship offers.

The next Table summarizes the number of students per (fully deployed) academic degree who have done internships: as one can see, there is a considerable percentage of graduate students who enjoy a work experience at the School of Engineering at UAB.

Bachelor's Degree	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Computer Engineering	52	116	168	171	139	162
Electronic Eng. Telecommunication	21	19	26	30	22	21
Telecommunication Systems Eng.	4	8	30	25	17	18
Chemical Engineering	11	31	28	52	35	29
Aeronautical Management	23	30	23	26	20	27

Undergraduate students in professional training placements (until April 27th, 2019).

All the information related to the work placements is summarized in the following link (in Catalan):

https://www.uab.cat/web/practiques-1345737392900.html

6.2 List of Companies for Work Placements

Next we list the companies with academic collaborations with the School of Engineering:

1. Accenture, SLU
2. ADF, Serveis Integrals de Càrrega
3. Advanced Automotive Antennas
4. AENA, S.A.
5. Aeris
6. Aerolink Air Services, S.L.
7. Aeroports Públics de Catalunya
8. Ágora Europe, S.A.
9. Air Baltic Corporation AS
10. Air Cat Fly, S.L.
11. Air Europa Líneas Aéreas , S.A.U.
12. Air Liquide
13. Airport Gurus, S.L.
14. Almirall, S.A.
15. Altran
16. Antara Informatic, SL
17. Antara Zenith, SL
18. Aopa Spain 2010
19. Aquambiente
20. Ares Capital
21. Aritex Cading, SA
22. ASLOGIC (Digital Aeronautics Eng)
23. Asociación LevelCo
24. Aviation Island S.L.
25. AXICON Spain - Gabriel Izard
26. Ayesa
27. Ayre Hotel Rosellón
28. Barcelona Supercomputing Center
29. Bella Aurora Labs, SA
30. Better Consultants
31. Big Imagination Games
32. Binsa Software, SLU
33. Blue Water Shipping España, S.A.
34. Bluestar Siliconas España S.A.,
35. Buscalibre España S.L.
36. Cafosa Gum
37. Caixabank, SA
38. Casa Darnes, S.A.
39. Cassa (Edars De Sabadell)
40. CELLS, Sincrotró ALBA
41. Compliance, Consulting & Eng.
42. Consorci Gestió Residus Valles Orient.
43. Continental Automotive Spain, SA
44. Coptering, S.L.
45. Cpq Ingenieros Sl
46. CRIDA, A.I.E.
47. CSA Windows Regulator BCN
48. Cube Fitness S.L.
49. Centre de Visió Computador
50. Dara Pharma
51. De Dietrich
52. Delecta Technologies, SL
53. Derypol
54. DESICO
55. DHL Global Forwarding S.L.U.
56. Dimasa
57. Dinamic Manutenciuó del Bages
58. Distiller Sa
59. Districte Nou Barris (Aj. BCN)
60. Dream Flyers
61. Ecoimsa (Tradebe)
62. Ecoparc2
63. Edar Rubí
64. Edreams International Network
65. Efficens Way Sccl
66. Eismann, SA
67. Electro Saghrma, S.A.
68. Emagister Servicios Formación
69. Enaire, S.A.
70. Ernst & Young, SL
71. Ersax trade, SL
72. Everis SL
73. Executive Airlines
74. Expertus Servicios Informáticos
75. Ficosa Adas, SL
76. Ficosa Electronics, SLU
77. Ficosa International, SA
78. FNG Fornes Logistics
79. Fornes Barcelona, S.L.
80. Fundació ESADE
81. Fundació puntCAT
82. Fundación Vicente Ferrer
83. Gates P.T. Spain, S.A.
84. Globalia Handling, S.A.U.
85. Hebron
86. Hewlett Packard Española
87. High Endurance Multipurpose Aerial Vehicles, S.L.
88. Hostelería Unida (HRJC I)
89. Hotelbeds Spain S.L.U.
90. Ideno Technologies
91. IGT
92. IKEA
93. Imagina Media Audiovisual Mediapro

94. Indra Sistemas SA
95. INFINITUM PROJECTS, SL
96. Information Systems Services Profesionalia
97. Ingedetec
98. Inibsa
99. Instalaciones y Montajes MARGON
100. Inst. Cartogràfig i Geològic de Catalunya (ICGC)
101. Intertrànsit, S.A.
102. Intgrup Congress and Events
103. Iriscene SW Corporation Fractalia
104. IST Servicios Informáticos, SL
105. Itestit, SL
106. J.L. Viajes Online
107. JCN Intertive, SL
108. K-LAGAN Tecnology & Consulting
109. Konozca Consulting, SL
110. Kuehne & Nagel, S.A.
111. LABRAND Psicología de Marcas
112. Lean Lemon, SL
113. Leap in Value, SL (Blueliv)
114. LGAI Technological Cente (Applus)
115. Lidl Supermercados, S.A.U
116. Linde Material Handling Ibérica
117. Lubrizol Advanced Materials Sales
118. Magneti Marelli España, SAU
119. Mail Boxes Etc.
120. Marfina Bus, S.A.
121. MASS Factory Urban Accessible Mobility
122. Matholding Group, Hidroglobal, Industrias Químicas Valles, Regaber
123. MEDIA SHARE EUROPE, S.L.
124. Metriplica, SL
125. Mitsubishi Electric Europe, BV
126. Navegación y Servicios Aéreos
127. Neovideo Ingeniería, S.L.
128. Netcentric Ibérica SLU
129. Nissan Motor Ibérica, S.A.
130. Olivia Sistemas, SL
131. Omitsis Consulting
132. Parc Aeronàutic de Catalunya
133. Petronas
134. Prestige Wings, S.A.
135. Protecmed
136. Punto Fa, SL (Mango)
137. Quantion
138. Reciclajes Rodilla, S.L.
139. Rhenus Logistics
140. Rotatek, SA
141. Saba Infraestructuras, S.A.
142. Schneider Electric España, S.A.
143. Sedatex SA
144. Seidor Consulting
145. Sener, Ingeniería y Sistemas, SA
146. Servizurich, SA Soc. Unip.
147. Singular Aircraft S.L.
148. Sistel Control, SL
149. Sist. Xarxes Informàtiques Calidae
150. Sociedad Concesionaria Nuevo Pudahuel S.A. (SCNP)
151. Soft Team Systems
152. Sogeti España
153. Sokoweb Technologies, SL
154. Stanum, SL
155. Stud & Globe
156. Subdirecció General Ports i Aeroports
157. Supermercados Llobet, SA
158. Sutein
159. Swissport Spain, S.A.
160. Systelab Technologies (Werfen Group)
161. TAF Helicopters, S.L.
162. Tecam Group
163. Tecnisample, S.L.
164. Tecnogeo, SL
165. Tecnoquim Del Valles (Chemipol)
166. Telstar
167. TENIGRAM SL
168. Tesipro Solutions, SL
169. Timatlas, SL
170. Tot Edition 2000, SL
171. Transportes Azkar, S. A.
172. UBK Correduria de Seguros, SA
173. Univ. Aeronáutica Querétaro
174. Uquifa
175. Van Lankveld Logistica S.L.
176. Vandemoortele
177. Volotea
178. Vueling Airlines S.A.
179. Wayna Aero, S.L.
180. Wibigoo S.L
181. Worldline Iberia (Atos)
182. Zener Multiservices, SL
183. Zero 2 Infinity, S.L.
184. Zetes Multicom,

6.3 List of Spin-offs

The School of Engineering also facilitates and promotes the transfer of knowledge generated by the research groups, as well as their R&D capabilities to help the innovation needs of the economic and social environment. This mission is achieved thanks to the UAB Research Park.

The UAB Research Park (PRUAB) is a non-profit organization created in 2007 by the Autonomous University of Barcelona (UAB), the Higher Council for Scientific Research (CSIC) and the Institute of Research and Technology (IRTA). Its mission is to promote and enhance the technology and knowledge transfer activities of its members, encourage entrepreneurship through the creation of new businesses based on research and generally facilitate interaction between research, business and society.

The Research Park provides services to UAB's research departments, as well as centres and institutes located on the Bellaterra campus. With the School of Engineering, the activities are around five core themes: Biotechnology and Biomedicine; Food Technology and Animal Health; Materials Science and Energy (nanotechnology and microelectronics), Information Technology and Communications; and Environment and Climate Change.

Companies (*spin-offs and EBTs*) incubated within UAB:

1. AEInnova
2. Aeris Environmental Technologies
3. Applied Nanoparticles
4. Aslogic
5. BioEclosion
6. Bioingenium
7. Care Respite
8. Cimab
9. Crowdmobile
10. FuturSiSens
11. HealthSportLab
12. Idetan
13. Inèdit Innovació
14. Klogene Therapeutics
15. MassFactory
16. Nanoligent
17. Nanotherapix
18. Rizoma
19. Visual Tagging Services
20. Ypsicon
21. Vetgenomics

Companies (*spin-offs*) *incubated within* CSIC

1. Alibava Systems
2. Cognicor
3. D+T Microelectrònica
4. EnergioT
5. Fuelium
6. Futurecrom
7. Graphene Nanotech
8. Nanomol Technologies
9. Oxolutia
10. Pure Inspiration
11. WeAR Technologies

Companies adhered to the Parc de Recerca UAB
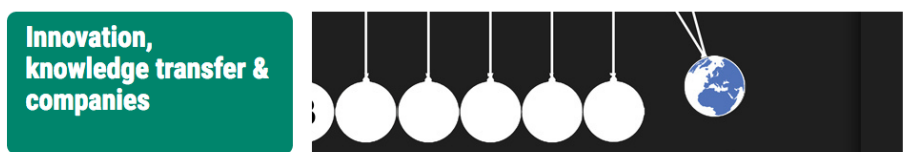
1. AB-Biotics
2. AbilityPharma
3. Afinitica
4. Afferent technologies
5. Ahead Therapeutics
6. Alya Technologies
7. AlayaCare
8. AntibodyBcn
9. Bcninnova
10. Ctrl4enviro
11. Cuantum Medical
12. Davantis
13. Delecta Technologies
14. Devicare
15. Ensis Science
16. Henkel
17. Human Centered Technologies
18. Icar Vision Systems
19. Imath Research
20. Lucta
21. Microlitix
22. Mirakonta
23. Muf
24. Odournet
25. Orain Technologies
26. Paperdrop Diagnostics
27. Pragmatic Diagnostics
28. Pump-it
29. Scytl
30. SensSolutions
31. Sequentia
32. Smart Automotive Solutions
33. Sòcol
34. XOBBCooperativa
35. Zetes
36. ZIP Solutions

6.4 Entrepreneurship Courses

- **STARTUP LAB UAB** : This programme is offered by the School of Engineering and UAB-Emprèn, for developing innovative technology-based projects with a positive social impact. This programme is aimed at undergraduated students who will work in multidisciplinary teams of two or three depending on the nature of their projects. For two months, they developed the idea together with a prototype showing the technology behind. Students receiveed the support of mentors and advice regarding hardware, software and business models. They will also receive training and mentoring by UAB-Emprèn, including the exchange of experiences with entrepreneurs and relevant stakeholders in the sector.

This year, the challenges were based on the Sustainable Development Goals (SDG) and were shared with the UAB Reptes event: 1) gender equality and women's empowerment; 2) Inclusive, safe, resilient and sustainable cities; 3) combat climate change and its effects and 4) sustainable growth and decent work for all.

The final of the contest was held on April 25, Thursday, in the framework of #MEMEnginy, the reference technology fair of the School of Engineering. The participating teams had worked for weeks with the mentoring of UAB faculty and had 5 minutes to present their project before a jury.

The jury was composed of Pere Condom, director of the Catalunya Emprèn program of the Generalitat de Catalunya; Sònia González, director of the UAB-Emprèn program; Daniel Franco, director of the School of Engineering of the UAB; and Dani Jiménez, CTO and founder of Waynabox. The final was started with an intervention by Condom, which highlighted the talent of the participants and highlighted the leadership of Barcelona within the global map of entrepreneurship ecosystems.

Among the seven finalist proposals, the jury in distinguished four as winners:

- Name: **Green Farm.**
  Team: Sandra Villegas, María José Romero.
  Description: Application to promote social inclusion and labor insertion of vulnerable groups through the recovery of green areas and contact with nature.
  Challenge: Inclusive, safe, resilient and sustainable cities.

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- Name: **Baobab**.
  Team: Jeroni Casassas, Laura Garcia.
  Description: Application of environmental awareness based on gamification.
  Challenge: Combat climate change and its effects.

- Name: **Ecomeal**.
  Team: Marc Gómez, Pol Salat.
  Description: Application to encourage the consumption of vegetarian foods in restaurants and contribute to the reduction of CO2 emissions in the meat industry.
  Challenge: Combat climate change and its effects.

- Name: **Festuc!**
  Team: Alan Fusté, Xavier Velasco, Dyhagho Briceño.
  Description: Virtual campus with analysis of student performance, based on machine learning.
  Challenge: Sustainable growth and decent work for all.

Two of these projects were born in UAB Reptes on March 12 (Green Farm and Ecomeal), while the Baobab team was also formed in that event, but it remade its original idea. The four winning teams will receive a surprise Waynabox trip; six months of advice, space and training at UAB-Emprèn, and access to Fablabs at the UAB to improve the prototype.

- **Generation of Ideas**: This programme is aimed at researchers at the university who want to promote the entrepreneurial spirit and the culture of innovation. It combines training and practical sessions for a business idea based on research. At the end of the programme three prizes are awarded according to the viability of the projects presented by the entrepreneurial teams and one grant for a period in the business incubator for the winning team. The program for 2019 can be downloaded here.

PowerLearn guanya el premi al millor projecte innovador de la 7a edició Programa de Generació d'Idees

El projecte PowerLearn, impulsat per investigadors del Vall d'Hebron Institut de Recerca, l'Institut d'Investigació en Intel·ligència Artificial, l'EUI Gimbernat i la UAB, proposa la creació d'una plataforma en línia per a la detecció dels trastorns del neurodesenvolupament que afecten el rendiment escolar.

Greene3D awarded best initiative of circular economy by the Generalitat and PRUAB

The Greene3D project, launched by Laura López Mir, PhD in Materials Physics by the Institute of Materials Science of Barcelona (ICMAB), and Beatriz Espinosa Aquino, PhD student at the Institute for Environmental Science and Technology at the UAB (ICTA), is based on the development of sustainable material for the development of sustainable materials for 3D printing using organic and bioplastic waste.

- **The AI4All Program:** This program was organised by Parc de Recerca and the Computer Vision Center at UAB, which offered a series of courses to promote the use of the Artificial Intelligence for technology transfer. The program offered 150 training hours on Artificial Intelligence technologies, on business management and on new business models centred on AI. The course, which had 25 participants of various professional profiles, has lasted four months and has provided students with technological tools and business management to promote the generation of new products. Parallel to that, and accompanied by a group of expert mentors, the 25 participants have developed their own projects with the intention of offering solutions to the real needs of the industry. The four developed projects were presented in an ideas contest in the Eureka building of the UAB Research Park before a jury of experts from the sector.

  The winning idea was **UDecision**, a system of recommendation and intelligent support to accompany the students in the process of choosing their university studies. More than 80% of high school students do not know what career they take and 34% of them leave their studies during the first years. The solution proposed by UDecision is based on the analysis of the data and values provided by the students in order to influence their criteria of choice and thus reduce the drop in rates of the studies. The project won a € 1,000 prize, sponsored by The Collider, the technology transfer program promoted by Mobile World Capital Barcelona and 6 months of incubation at the Eureka Building of the UAB Research Park to further develop the proposal. The other projects that have been developed are the following:

  - **Air4in**: proposes a detection, analysis and recommendation system with the objective of improving air quality in closed spaces. The proposal combines the installation of sensors for the detection of pollution levels with a data analysis system.

  - **IAauctoritas**: is an assistive diagnostic platform in the cloud through specific neural networks of images resulting from each image-based diagnostic test (ultrasonography, NMR, TAC, ...).

  - **SmartMeasure&Predict:** proposes a predictive maintenance service capable of providing solutions and facilitating the efficient management of any company.
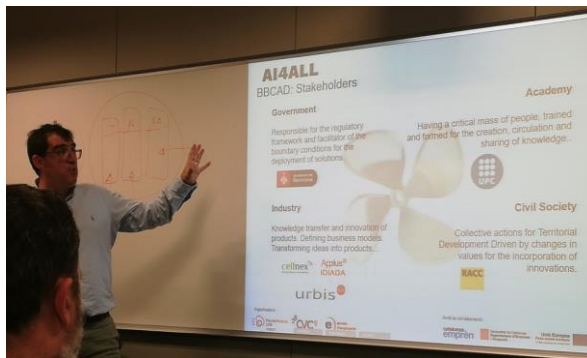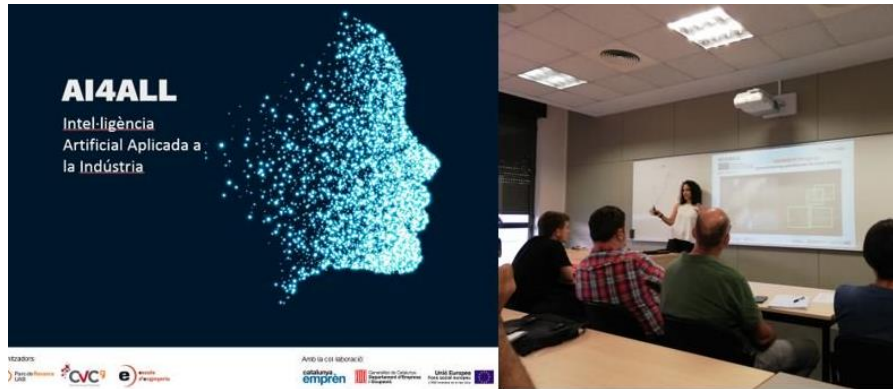
- **Learning to do Business (Aprendre a Emprendre)**: This is a 30 hours course that leads to 2 open credits for students in the final year of any degree course and also to Masters and PhD students. It offers training in entrepreneurial skills for the practical process of setting up a business, whether from the participant's own ideas or scientific ideas being developed by university research groups which have commercial potential. There is a limit of 40 places on the course and candidates must apply via a selection process based on their business motivation.

- **PhD in Entrepreneurship and Management/ IDEM**: This programme is offered by the Department of Economics and Business at the UAB and promotes competitive research on an international scale to produce major scientific contributions and generate new socially useful knowledge in the areas of the business management and economics. The PhD is addressed mainly to graduates in Business Administration and Management or Economics who have taken a research Masters degree in these academic areas and who wish to produce a doctoral thesis in one of the fields of business administration and management: company creation, management and direction of SMEs, strategy, marketing, finances and accounting, innovation, public companies and efficiency analysis.

Appendix A. Budget 2018-2019 (in Catalan)

REPARTIMENT PRESSUPOST 2018				
SECCIONS		**Pressupost**	**Avançament Gener i Juny 2018**	**Transferència restant**
Centre de cost	**Nom**			
C0115.01	Enginyeria Informàtica	4,159.49	3,506.36	653.13
C0115.08	Enginyeria de Telecomunicació	2,105.92	1,930.04	175.88
C0115.03	Enginyeria Química	1,895.67	1,473.56	422.12
C0155.11	Gestió Aeronàutica	1,114.28	973.98	140.29
DEPARTAMENTS			**Avançament Gener i Juny 2018**	**Transferència restant**
Centre de cost	**Nom**	**Pressupost**		
469	Arquitectura de computadors i Sistemes Operatius	4,793.78	3,728.29	1,065.50
470	Microelectrònica i Sistemes Electrònics	4,353.28	3,629.85	723.43
471	Ciències de la Computació	9,622.78	7,901.74	1,721.04
472	Enginyeria de la informació i de les Comunicacions	7,461.91	6,347.63	1,114.29
463	Enginyeria Electrònica	4,800.89	4,923.62	-122.74
461	Telecomunicació i Enginyeria de Sistemes	9,125.67	7,856.66	1,269.01
447	Enginyeria Química	9,719.89	7,194.34	2,525.55
402	Matemàtiques	1,042.41	1,270.87	-228.46
403	Química	398.78	467.13	-68.35
404	Física	440.99	510.70	-69.71
411	Economia Aplicada	123.68		123.68
438	Dret Privat	71.00		71.00
468	Psicologia Social	55.70		55.70
410	Empresa	491.19	547.23	-56.04
ESCOLA		**Pressupost**	**Avançament Gener i Juny 2018**	**Transferència restant**
Funcionament específic Sabadell (C0115.50)		5,300.20	4,505.11	795.10
Biblioteca Sabadell (C0115.50)		935.50	844.96	90.53
Renovació ordinadors Sabadell (C0115.50)		6,249.38	10,198.97	-3,949.59
Manteniment informàtic Sabadell (C0115.50)		1,000.00	-	1,000.00
Serveis comuns Sabadell (C0115.50)		3,100.00	2,642.75	457.25
Renovació servidors SID Sabadell (C0115.50)		1,067.22	1,067.22	-
Biblioteca Bellaterra		7,492.44	4,105.70	3,386.74
Consell d'estudiants (E051700)		500.00	-	500.00
SIEE Manteniment informàtic (CO115.06)		7,000.00	5,967.50	1,032.50
Equipament informàtic Bellaterra (C0115.16)		30,000.00		
Infraestructures i equipaments docents (C0115.17)		37,500.00		
Manteniment SAI, grup i serveis comuns (C1105.18)		8,000.00		
Promoció (C0115.19)		14,000.00		
Quotes associacions (C0115.21)		5,000.00		
Coordinació provisional Smart Cities (CC?)		750.00		
Funcionament Escola		21,200.82		

Funcionament Escola		
Gestió acadèmica (C0115.20)	11%	9,717.04
Atencions socials, viatges, inscripcions (C0115.21)	11%	9,717.04
Material d'oficina, fotocopies (C0115.22)	2%	1,766.73