

## Examples of seminars in English on first semester 2016-2017.

| Título  | Ponentes   | Sesiones de 1,5h/fecha  |
|---|--|-------------------------|
| Examples and exercises for mixed-signal integrated circuit design | Bernd Cettl/ <i>Infineon</i>                             | 2/6 Oct horario mañana  |
| Micro ElectroMechanical Systems                                   | Dr. Cesare Buffa/ <i>Infineon</i>                        | 2/21 Oct                |
| Sensor networks in SmartCities, Smart Energy & Smart Utilities    | Fernando Monzón/ <i>Everis</i>                           | 1/11 nov                |
| Virtual Photonics Instrumentation in Photonics Subsystems         | Bruno Fracasso/Kevin Hegartty<br><i>Telecom Bretagne</i> | 4 /1 y 2 dic            |
| Scientific& Technical English                                     | Kevin Hegartty <i>Telecom Bretagne</i>                   | 2 /2 dic horario mañana |

### Summary and speakers curricula

#### 1. “Examples and exercises for mixed-signal integrated circuit design”

**Speaker:** Bernd Cettl (Infineon Technologies)

**Short CV:** He was born in Vienna, Austria, in 1977. He received the Dipl.-Ing.(Fh) degree in electrical engineering with the specialization “Audio/Video electronics” from the University of Applied Science in Vienna in 2001. From 2001 to 2003, he was employed at Austrian Aerospace, in Vienna. In 2004 he joined Infineon Technologies in Villach, Austria, as an analog and mixed-signal design engineer. From 2012 onwards, he changed to the concept development group for silicon microphone products. Also from 2012, besides his full-time job at Infineon, he studied the Master of Science program “Systems design” at the University of Applied Science in Villach and passed with distinction in 2014.

**Summary:** In this course, a selection of some examples and exercises are picked out of the vast topic “mixed-signal integrated circuit design”. As the seminar title also suggests, the course comprises of two sections: Examples and exercises. For the first section, some practical examples will be presented where the students will be able to develop a feeling of the quantities involved – not just symbolic results out of some theoretical formulas. Of course, also valid for the exercises section, the students will obtain a deeper understanding of the concerned circuit block. Hereby, the students will be invited to think / calculate for some minutes for themselves alone or work in pairs / small groups. Right afterwards, the solutions will be found together.

**Assessment proofs:** test

#### 4. Micro ElectroMechanical Systems

**Speaker:** Cesare Buffa

**Short CV:** He received his M.Sc. degree in electronic engineering and his Ph.D in Information Technology from Politecnico di Milano, Italy, respectively in 2009 and 2013. Parallel to M.Sc. he attended Alta Scuola Politecnica (ASP) multidisciplinary degree program.

At Politecnico di Milano he was also teaching assistant for the courses of “Fundamentals of Electronics”, “Optoelectronics” and “Detectors, Microsensors and Microsystems”.

His research focused on CMOS imaging sensors, microelectromechanical systems and sensors readout electronics. In 2012 he was visiting researcher at Berkeley Sensor & Actuator Center, Davis, California and since December 2012 he has been working as an analog and mixed-signal designer at Infineon Technologies Austria AG. He has authored about 15 refereed publications.

## **SUMMARY**

Microelectromechanical Systems are microscale systems made of electronics and mechanical moving parts, being able to perform something “interesting or useful”. MEMS are an increasingly pervasive technology which involves many different fields of application such as consumer (e.g. gaming, smartphones, navigation), automotive (e.g. airbag systems, ESP), healthcare (e.g. pacemakers, in-vitro analysis), ... Success of MEMS is due to their small dimensions and robustness; they deliver high performance and they are extremely cost effective to manufacture in large volumes.

This seminar introduces to MEMS multidisciplinary world, giving an overview about MEMS working principles and applications. In the first part of the seminar hints are also given about technology and fabrication, packaging, testing, reliability and market. The most common readout techniques are then introduced, focusing on capacitive sensing: as a case-study the development of a magnetic field sensor is proposed. Starting from project specifications, follow concept at system level, device and readout electronics design and, finally, characterization. The seminar concludes with MEMS research in academia, interest in industry and future perspectives, looking in the direction of Nanoelectromechanical systems.

## **8. Virtual Photonics Instrumentation in Photonics Subsystems**

**Speakers:** Kevin Heggarty (Telecom Bretagne)

**Short CV:** **Kevin Heggarty** was born in Salisbury, Rhodesia (Zimbabwe) in 1964. He grew up and studied in the United Kingdom, obtaining his BA in Natural Sciences (Physics) from Cambridge University in 1987, his MSc in Telecommunications Engineering (Essex University) in 1988 and his doctorate from the Ecole Nationale Supérieure des Télécommunications de Paris in 1991. After teaching in Africa for a year (Chad) he was successively postdoc, research engineer and lecturer at Telecom Bretagne in Brest, France, where he is now full professor in the Optics department. His research interests are the design, fabrication and applications of diffractive optical elements and spatial light modulators. He has published over 60 patents, journal and conference publications, participated and run 6 EU projects and numerous national, regional and industrial contracts. In 2002 he was on sabbatical leave as an invited researcher at the University of Edinburgh and CRLOpto Ltd in Scotland. He co-founded the start-up company Holotetrix in 2007.

**Summary:** Optical transmission and networking basics will be given along with some optical link simulations to illustrate those concepts. A commercial software Virtual Photonics Instrumentation Transmission Maker will be used on the lab sessions to model those optical networks.

**Assesment proofs:** test on lab sessions manual

## 9. Scientific & Technical English

**Speakers:** Bruno Fracasso and Kevin Heggarty (Telecom Bretagne)

Short CV: **Kevin Heggarty** was born in Salisbury, Rhodesia (Zimbabwe) in 1964. He grew up and studied in the United Kingdom, obtaining his BA in Natural Sciences (Physics) from Cambridge University in 1987, his MSc in Telecommunications Engineering (Essex University) in 1988 and his doctorate from the Ecole Nationale Supérieure des Télécommunications de Paris in 1991. After teaching in Africa for a year (Chad) he was successively postdoc, research engineer and lecturer at Telecom Bretagne in Brest, France, where he is now full professor in the Optics department. His research interests are the design, fabrication and applications of diffractive optical elements and spatial light modulators. He has published over 60 patents, journal and conference publications, participated and run 6 EU projects and numerous national, regional and industrial contracts. In 2002 he was on sabbatical leave as an invited researcher at the University of Edinburgh and CRLOpto Ltd in Scotland. He co-founded the start-up company Holotetrix in 2007.

**Summary:** Most common scientific and technical terms will be revisited and some guidelines about how to write a scientific publication in English will be given.

**Assesment proofs:** exercises