EUROTRAINING - 316526

D3.2.2 – Webinar II

WEBINAR

“Internet of things as opportunity for SMEs and University: a joint applied research cooperation”

DATE	December 14th, 2015
PROJECT	EUROTRAINING – FP7 - 316526
START DATE AND DURATION	01/01/2013 - 36 months
ABSTRACT	Deliverable D3.2.2 – Description of the 2nd EuroTraining Webinar
Dissemination level	PU
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1. Executive summary

The first webinar elaborated by the Eurotraining project was released in 2014 and entitled “Novel Technologies and Solutions for Electronics”. This Webinar analysed some of the novel nanotechnologies that are candidate to become part of the future of electronics.

The second webinar has been implemented during M30 of the project lifetime and entitled “Internet of things as opportunity for SMEs and University: a joint applied research cooperation”, with the goal of describing the advanced solutions, useful for innovative industrial applications, given by the Internet of Things (IoT). The second Webinar is published at page http://www.eurotraining.net/webinars2.php and on YouTube.

The Eurotraining Webinar II is the result of a Wwrkshop organized at the Politecnico di Torino, on June 5, 2015, and recorded with the aim of on line publication on the Eurotraining website. The workshop reached the goal of creating a fruitful collaboration between the research institutes presenting the contents (Politecnico di Torino, CEA-Leti, Italian Institute of Technology, Centro SuperCalcoloPiemonte - CSP) and local companies that participated to the event.

The goal of the Webinars was not only related to the contents themselves, but also to create a novel channel useful to the EuroTraining users, indicating the technological solutions for setting up an innovative and attractive course based on the most advanced web technologies. The accesses reached to Webinar I are a tangible prove of the efficacy of this action.

Figure 1: flyer of Torino Workshop

2. Webinar Contents

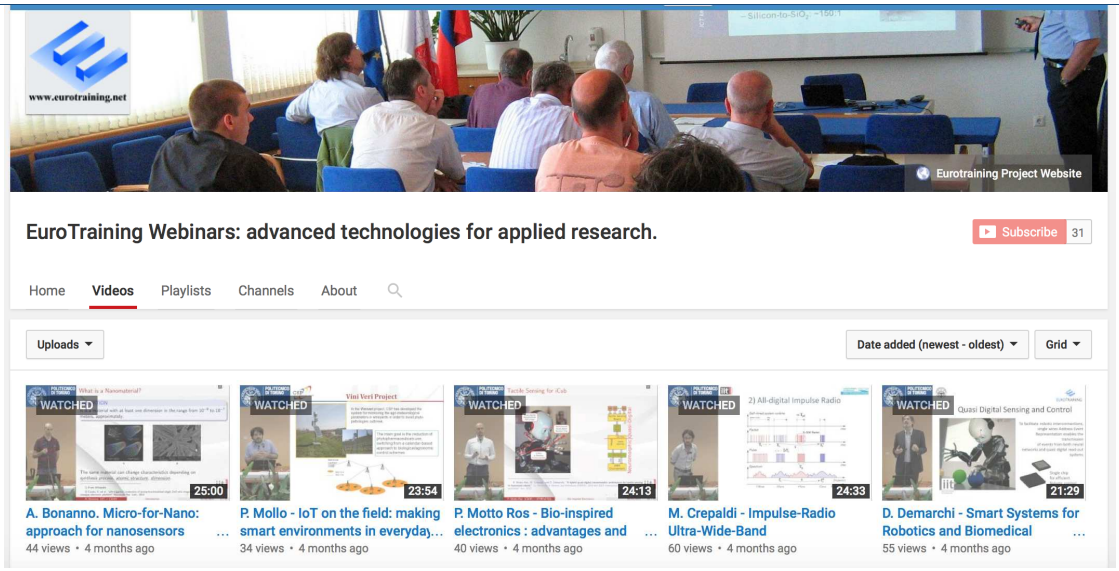


Figure 2: entry page to Eurotraining Webinars

The YouTube Channel of Eurotraining is accessible at the link:https://www.youtube.com/channel/UCQbYsyNONIk9hsBd-QQ_gPQ.

Figure 2 is depicting the main page. The first time user can view a short outline of the two Webinars, with a 3 minutes short video introducing Eurotraining and its activities located at the main page.

On the right side of the page are presented some YouTube Channels that were selected because of their potential interest for the user. For example NanoHub was inserted in the list of these Featured Channels.

From the Menu it is possible to select:

- Videos, where the single videos of the Webinar are present
- Playlists, where the videos, organised in Playlists are showed
- Channels, where the list of the Featured Channels is presented
- About, where the Project Eurotraining is quickly described

The Webinar II is available at the link:
http://www.eurotraining.net/webinars2.php.

The link gives the user a general view of the Webinar contents (see Figure 3), with a short description of each lecture.

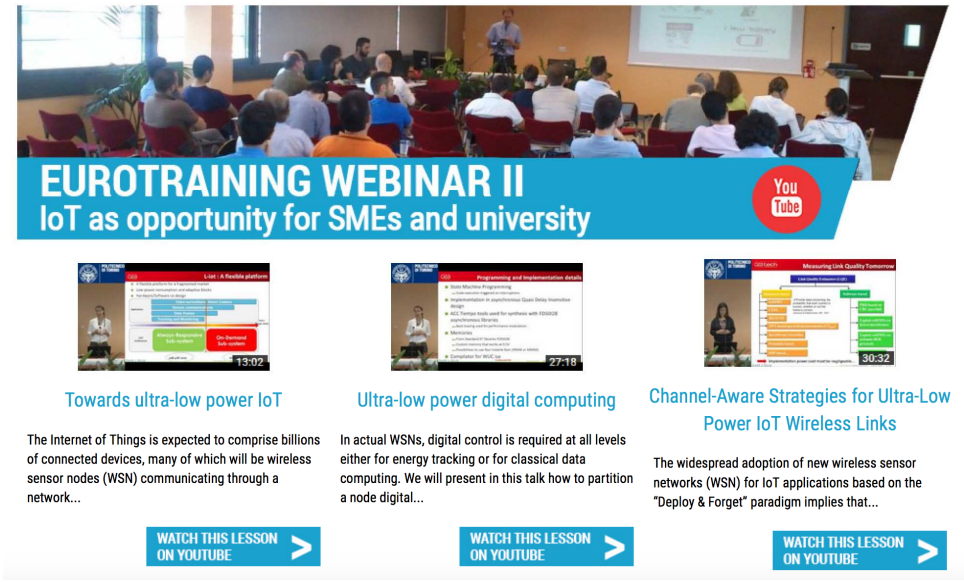


Figure 3: Webinar II Webpage

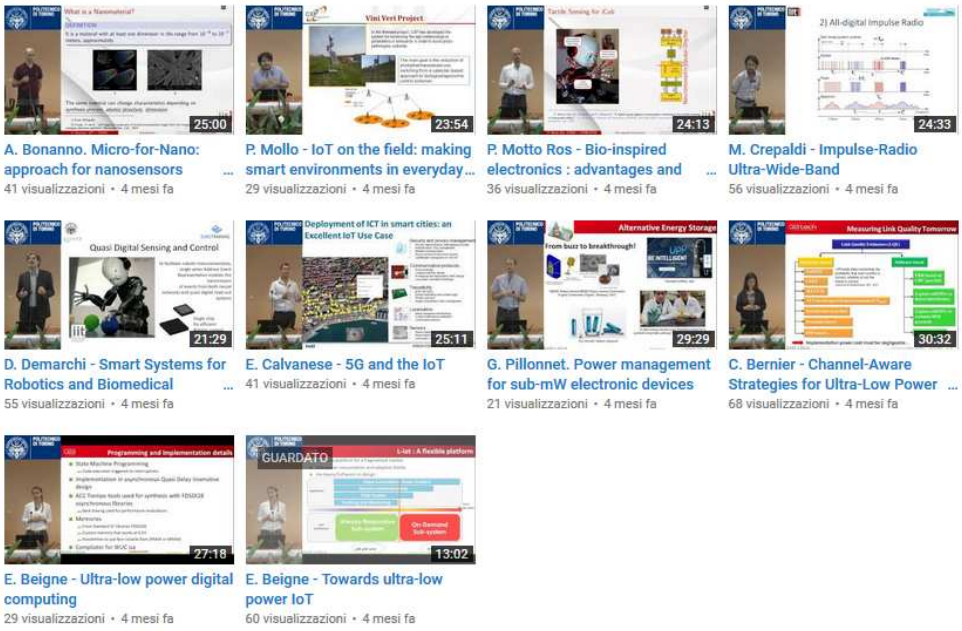


Figure 4: Webinar II Contents in YouTube

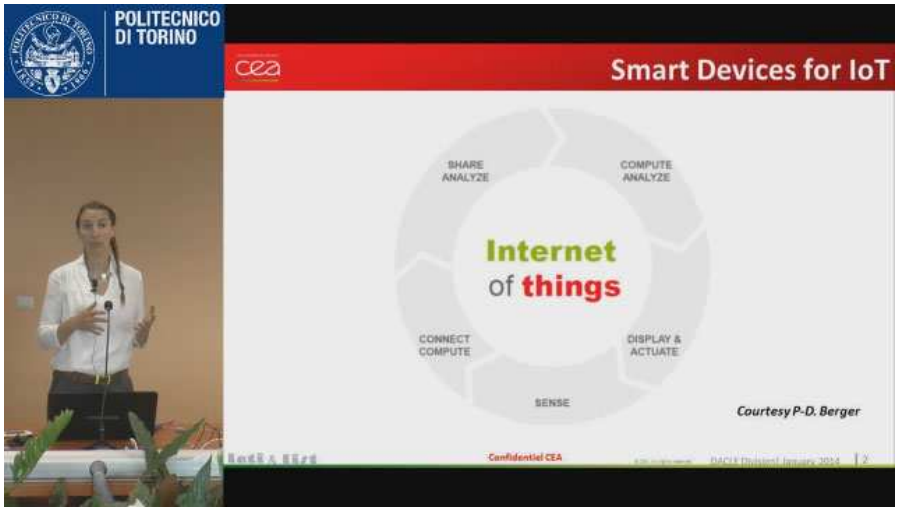
As depicted in Figure 4 the Webinar is organised in 10 chapters:

1. Towards ultra-low power IoT
2. Ultra-low power digital computing
3. Channel-Aware Strategies for Ultra-Low Power IoT Wireless Links
4. Power management for sub-mW electronic devices
5. 5G and the IoT
6. Smart Systems for Robotics and Biomedical
7. Impulse-Radio Ultra-Wide-Band
8. Bio-inspired electronics : advantages and challenges for robotic applications
9. IoT on the field: making smart environments in everyday experiences
10. Micro-for-Nano: approach for nanosensors integration onto CMOS electronics

As can be seen from the chapters, the goal is to introduce the concept of IoT and the importance of Power Consumption. Some specific applications are described, giving a good overview useful for the audience to individuate topics of interest.

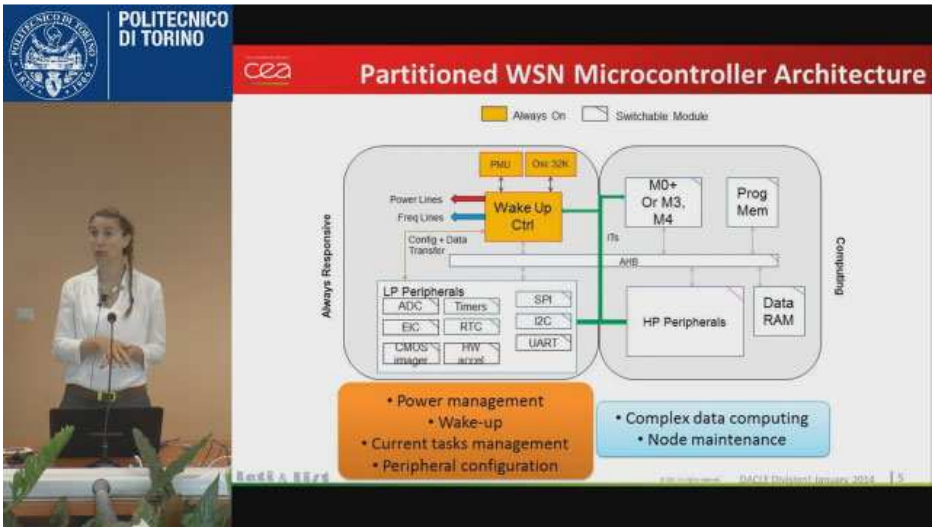
In the next sub-chapters some details about the different lectures are reported.

2.1 Towards ultra-low power IoT



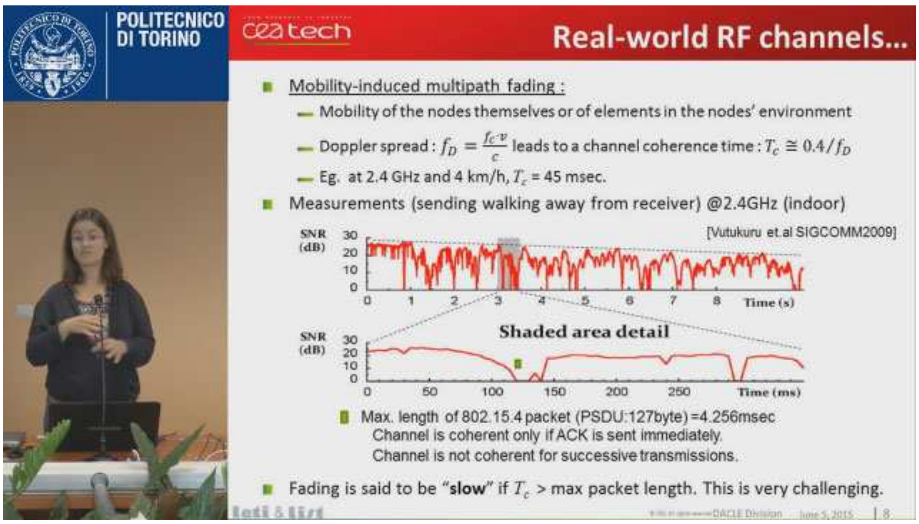
In this section E. Beigne explains that the Internet of Things is expected to comprise billions of connected devices, many of which will be wireless sensor nodes (WSN) communicating through a network. The nodes are spatially distributed and able to measure physical or environmental conditions while transferring data through a wireless link.

2.2Ultra-low power digital computing



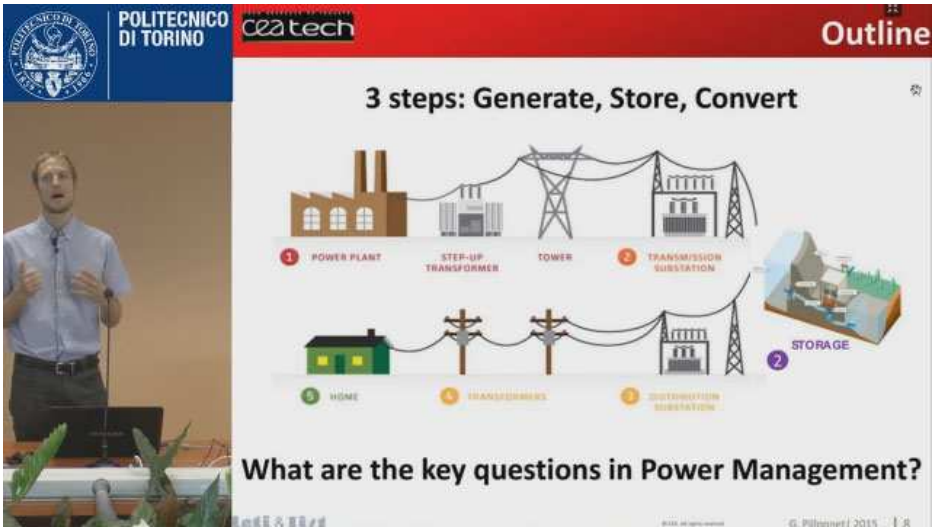
In this section E. Beigne presents how to partition a node digital control architecture between an always-responsive Wake-up system and a more classical computing part based on an ARM micro-controller.

2.3Channel-Aware Strategies for Ultra-Low Power IoT Wireless Links



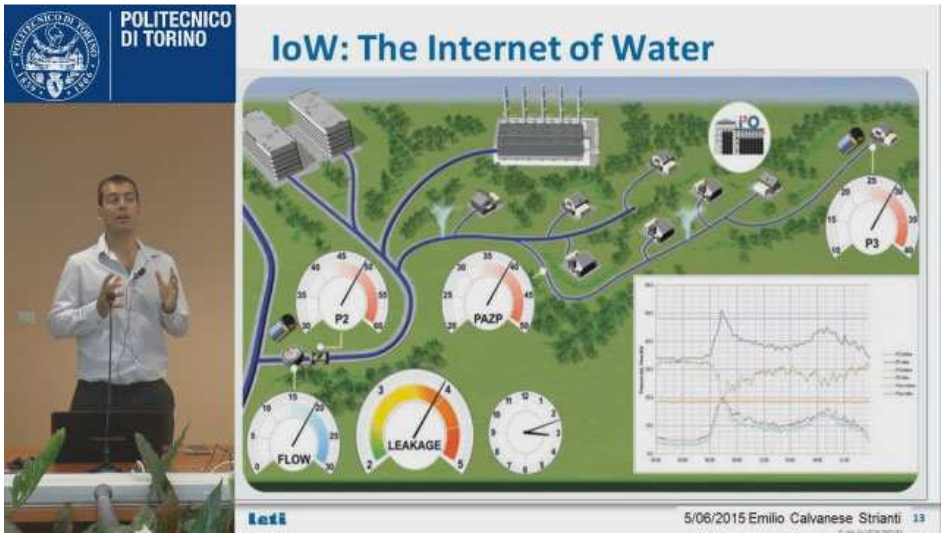
In this section C. Bernier explores the possibility of exploiting the variable nature of the wireless channel in order to drastically reduce the power consumption of wireless nodes.

2.4Power management for sub-mW electronic devices



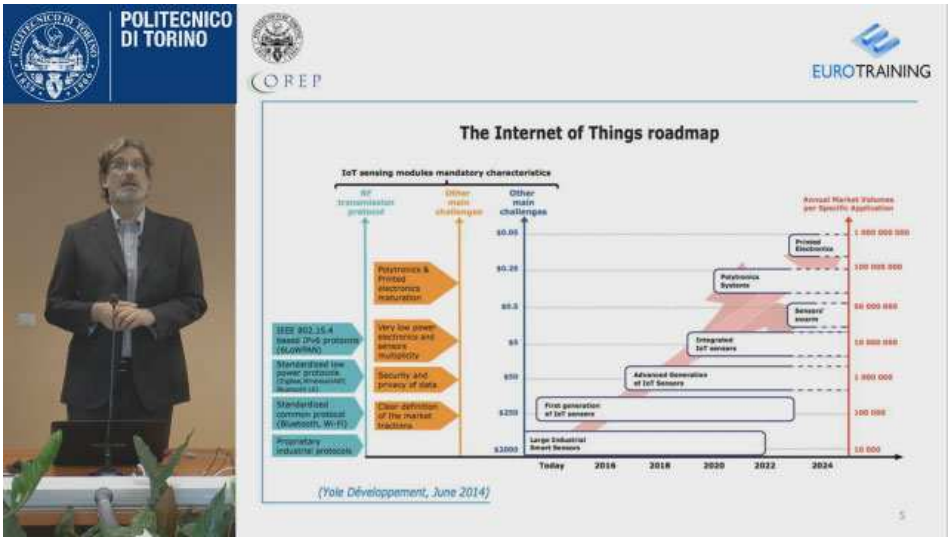
In this lectureG. Pillonnet describes the main steps to efficiently harvest, convert, store and supply power in a sub-mW context.

2.55G and the IoT



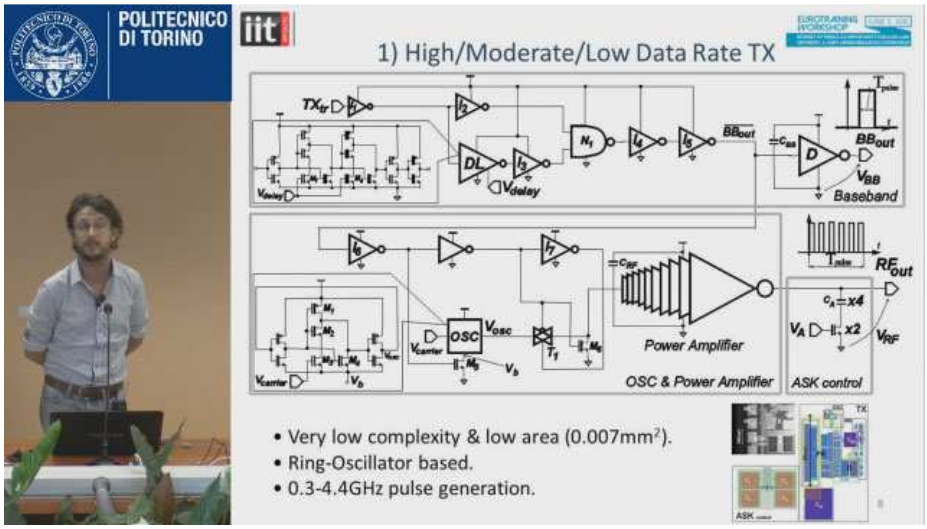
In this section E. Calvaneseprovides insights on the directions the research should have, for system design and standardization, in order to meet the technical challenges of future integration of 5G wireless networks and IoT indeed contribute to increase capacity, scalability, latency and energy consumption of current systems and decreasing electromagnetic pollution and carbon footprint.

2.6Smart Systems for Robotics and Biomedical Applications



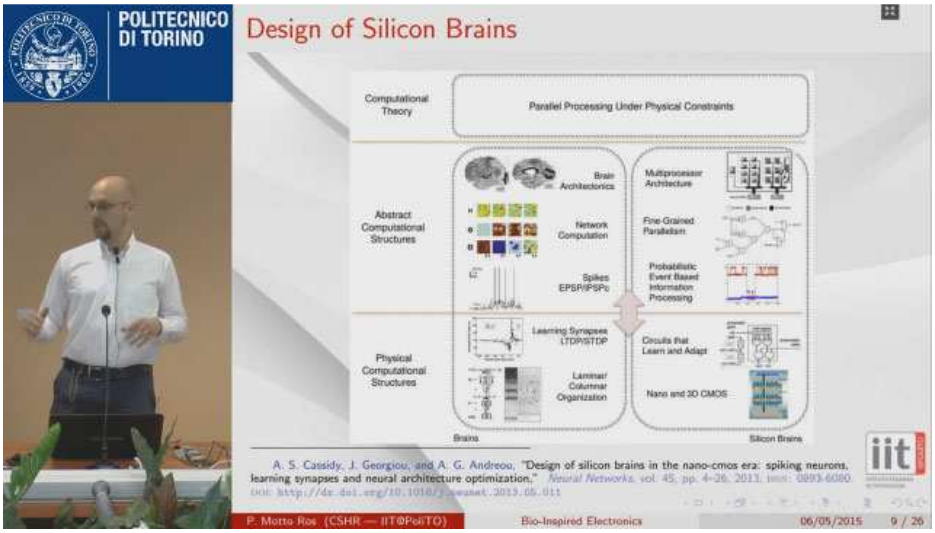
In this lecture D. Demarchi presents the joint effort between the Politecnico di Torino, Micro&Nano Electronic Systems Laboratory, and the IstitutoItaliano di Tecnologia, IIT@Polito Center for Space Human Robotics. An overview of the implemented devices is given, with particular emphasis to the ones closer to possible industrial applications.

2.7Impulse-Radio Ultra-Wide-Band



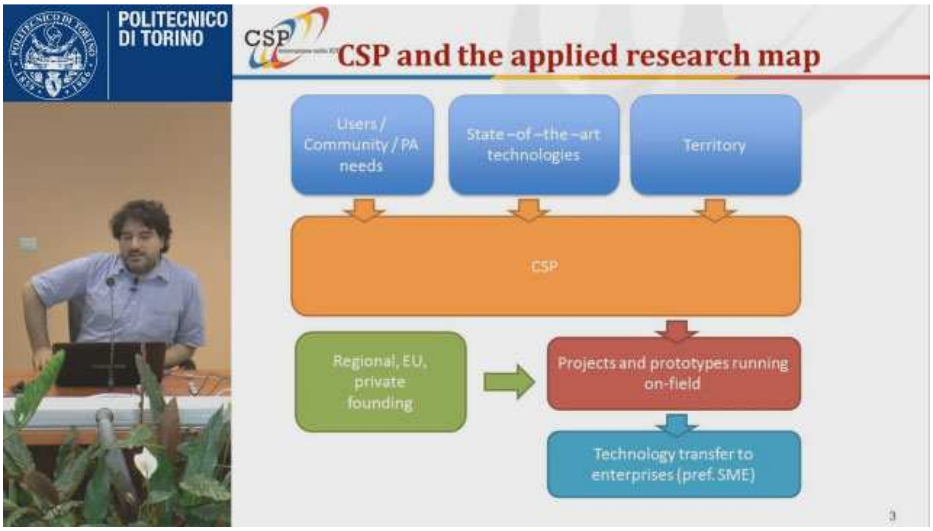
In this talk M. Crepaldi presents recent low complexity solutions for IoT radios suited to a wide class of application domains where moderate/low data rate and short communication distance is pursued.

2.8Bio-inspired electronics: advantages and challenges for robotic applications



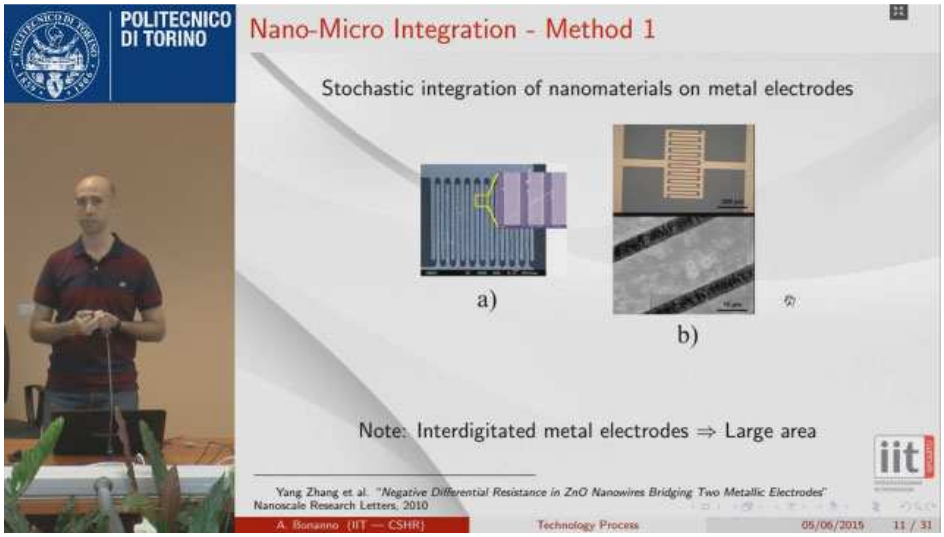
In this lecture, P. Motto Ros presents ideas, examples and applications of how bio-inspired systems can be used and integrated into robotic applications.

2.9IoT on the field: making smart environments in everyday experiences



In this lecture P. Mollo presentsin-field case studies applied to environmental, agricultural and energetic contexts, developed in collaboration with local entities operating in different vertical scenarios in which IoT can be declined.

2.10Micro-for-Nano: approach for nanosensors integration onto CMOS electronics



In this section A. Bonanno describes the Micro-for-Nano (M4N) approach, which aims to merge 130nm CMOS technology with nanotechnology, involving low-cost techniques (i.e., CMOS post-processing and DiElectroPhoresis) for the nanomaterials assembly onto CMOS chip and designing ultra-low power Read-Out Circuits (ROCs) for nanosensors interface.

3. Statistics of access to Webinars

The statistics of the access to the 2 webinars are reported. The numbers of Webinar II are lower, because it was recently published on September 2015.

INTRODUCTION TO EUROTRAINING – 112 views

WEBINAR I (total 1492):
- Eurotraining Webinar Introduction – 193 views
- Why Nanotechnologies in Electronics – 111 views
- Molecular QCA – 144 views
- Conduction Mechanisms in Molecules – 340 views
- Molecular Electronics I – 496 views
- Molecular Electronics II – 128 views
- The Micro for Nano (M4N) – 80 views

WEBINAR II (total 462):
- Towards ultra-low power IoT - 60 views
- Ultra-low power digital computing – 32 views
- Channel-Aware Strategies for Ultra-Low Power IoT Wireless Links - 68 views
- Power management for sub-mW electronic devices – 24 views
- 5G and the IoT – 44 views
- Smart Systems for Robotics and Biomedical – 55 views
- Impulse-Radio Ultra-Wide-Band – 61 views
- Bio-inspired electronics: advantages and challenges for robotic applications – 40 views
- IoT on the field: making smart environments in everyday experiences – 34 views
- Micro-for-Nano: approach for nanosensors integration onto CMOS electronics – 44 views

EXTRA:
- Hardware-In-The-Design for Wireless Sensor Networks Based on IR-UWB – 200 views

4. Conclusions

The Webinar section of Eurotraining was completed, with the second edition, focused on the Internet of Things.

In terms of contents, the Webinar II, as the previous one, has been chosen according to the suggestions received from the survey done in the beginning of the project, that indicated IoTs as an important application domain for the realization of novel products.

Logically it is not a full coverage of all the possibilities nowadays present in the State of the Art, but the most important concepts were considered.