COLLOQUE DU GDR SOC-SIP
BORDEAUX, 14-16 juin 2017
EQUIPE RESP/ANIM DE L’AXE

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DATA DRIVEN WORLD → CYBER-PHYSICAL SYSTEM

Requires smart data & smart and self reconfigurable objects

2 key challenges
power efficiency & security
NEW CHALLENGES FOR CYBER-PHYSICAL SYSTEM

- **Smart sensors**
  - To minimize the power towards autonomous sensors
  - To increase the flexibility (=> digital architecture)

- **Innovative algorithms**
  - Enhance the performance
  - Improve the security and reliability
  - Synchronicity between physical and software components
ONE OF THE MAIN BOTTLENECKS: CONNECTIVITY, INTERFACE

Interface with the physical data
- To integrate a localized intelligence at the level of the object (sensitive node), this intelligence must consume as little as possible, in agreement with the application
- Power management, reconfiguration to reach drastic reduction in power consumption around 70%
- Compressed sensing to reduce the number of data towards smart data

Interface with the computational heart
- Fast and interoperable wired or RF communications
- Cyber security
- Power efficiency increase: drastic reduction in the power consumption of 90% for future 5G communications compared to the existing ones
Des journée d’animation
2017-2018
CAPTEURS INNOVANTS & OBJETS CONNECTÉS AUTONOMES FAIBLE CONSOMMATION

Date : 25 avril 2017
Lieu : Université de Toulon

Programme :
10h00 – 12h00: Talks I & II
Futur de la RFID : Au-delà de l'Identification
Dr. Claude TETELIN
Président de la commission IoT de l'Afnor, CNRFID, Rousset
Radio for IoT Networks : From Adaptive Radio to BiCephalous Systems
Dr. Dominique MORCHE
CEA LETI, Grenoble

14h00 – 16h00: Talks III & IV
Micro-Capteurs Magnétiques Intégrés sur CMOS et Applications
Dr. Luc HEBRARD
Laboratoire ICube - UMR 7357, Université de Strasbourg
RF Low Power Design Technics
Dr. Sylvain BOURDEl
Minatec-Phelma, Grenoble INP
ENVIROMENTAL IMPACT OF RF 5G COMMUNICATIONS AND IOT GROWTH: TOWARDS GREEN TECHNOLOGY

Date: November 13th to 17th

Lieu: IMS Laboratory

Topics of the presentations:
The most urgent issue for green technology, includes the development of alternative materials/substrates, new means of generating energy and energy efficiency.

1/ Life cycle of materials in mobile phones from extraction to recycling

2/ Technologies: green flexible electronics based on biodegradable cellulose nanofibril paper, FDSOI technology, and so on.

3/ Energy consumption with one talk on the wireless transfer of electromagnetic energy and one another talk on high efficiency transmitters.
ANALOG TO INFORMATION, ANALOG-TO-CLASSIFICATION: NEW PRINCIPLES TO EXTRACT RELEVANT INFORMATION

Date: December 2017
Lieu: LTCI, Telecom ParisTech

Topics of the presentations:

1) Analog-to-information sensing, going beyond compressive sampling

2) Traitement parcimonieux de signaux biologiques (A to C)

3) Analog-to-Information Converter Design for Low-Power Acquisition of Astrophysical Signals
CAPTEURS ET INTERFACES POUR LA SANTÉ

Période de programmation : S1 2018

Thèmes qui seront abordés :

interface avec l’environnement biologique (contraintes thermiques de biocompatibility, d’usage (discrétion)...), compression et transmission de l’information...
FULL SOFTWARE RADIO TRANSMITTER FOR 5G APPLICATIONS

Période de programmation : S1 ou S2 2018

Thèmes qui seront abordés :
- Highly digital and flexible transmitters
- RF DAC based-Tx
- ARFPD to linearize wideband PA
- exploring better efficient algorithms, mixed analog-digital implementation and co-design of algorithms with merged DAC+PA functions.