EmerTech: Emerging Technologies for Sensing Applications

Chair: Almudena Rivadeneyra

Pervasive Electronics Advanced Research Laboratory. University of Granada (Spain)

Contact email: **arivadeneyra@ugr.es**

UNIVERSIDAD DE GRANADA

ALLSENSORS 2020

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Almudena Rivadeneyra

ALMUDENA RIVADENEYRA received the master's degrees in telecommunication engineering, environmental sciences, and electronics engineering from the University of Granada, Spain, in 2009, 2009, and 2012, respectively, and the Ph.D. degree in design and development of environmental sensors from the University of Granada in 2014. She was with the Institute for Nanoelectronics, Technical University of Munich from 2015 until 2018, where her work was centered in printed and flexible electronics with a special focus on sensors and RFID technology. She is currently Marie Curie fellow at the University of Granada developing printed autonomous gas sensors.

Motivation

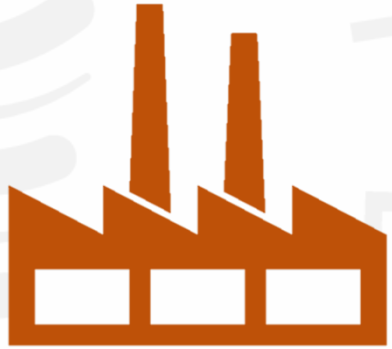
- This special track is dedicated to recent developments in **emerging technologies for sensing devices and applications**
- These techniques possess **outstanding features**: thin, lightweight, flexible, large-scale manufacturing, environmental-friendly devices and produced at low cost
- There are still **challenges** to overcome

Internet of Things (IoT)

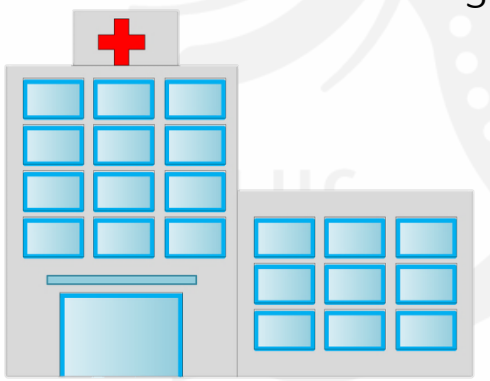
Things connected to Things → possible to access data from a distance and to remotely monitor and control our physical world

Smart environment

Smart cities

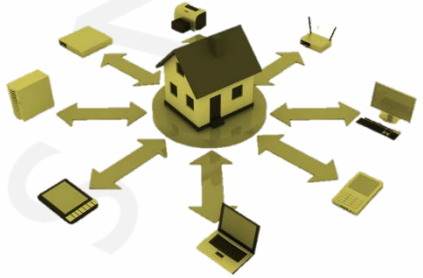


Industrial control



eHealth

Logistics



Domotics

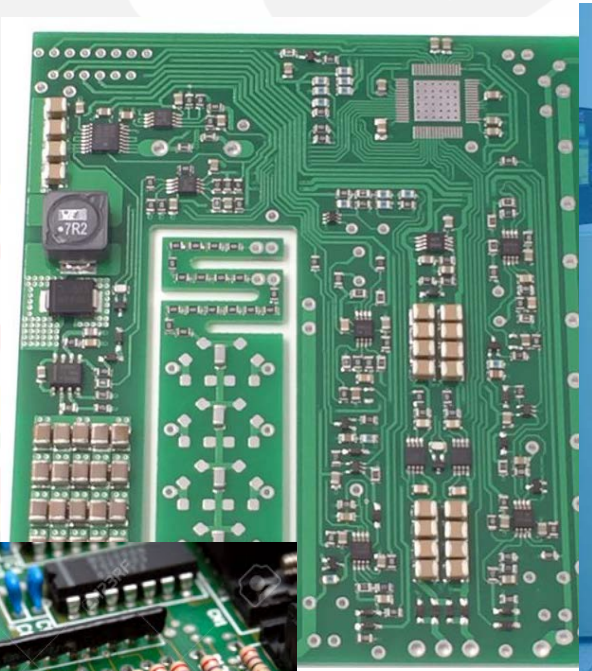
Technology in the IoT

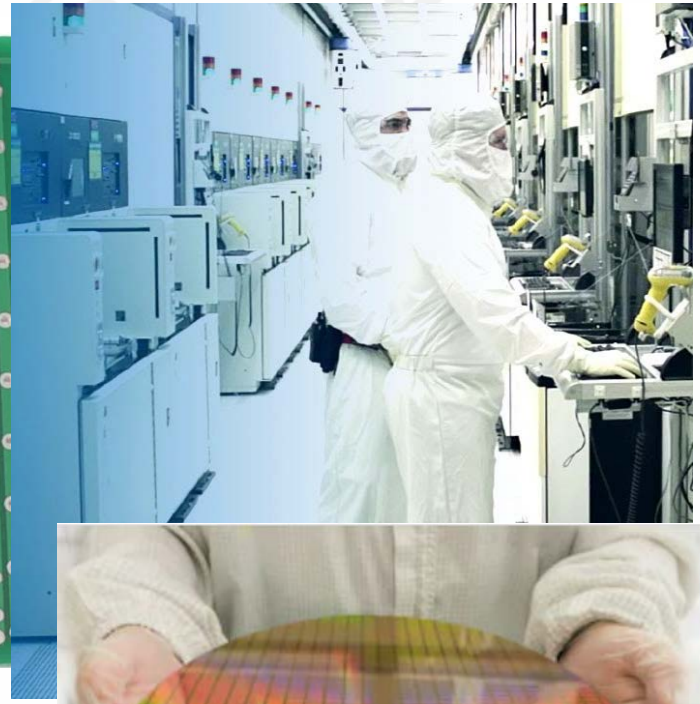
Silicon technology

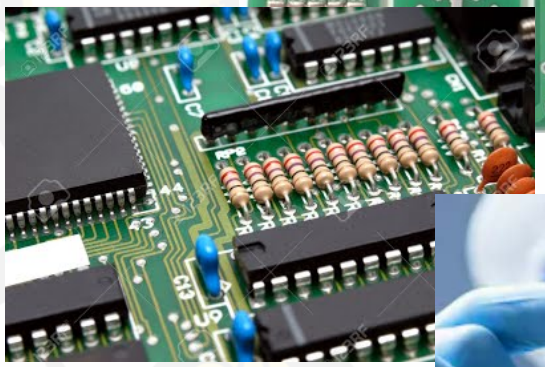
Conventional IC-CMOS technology

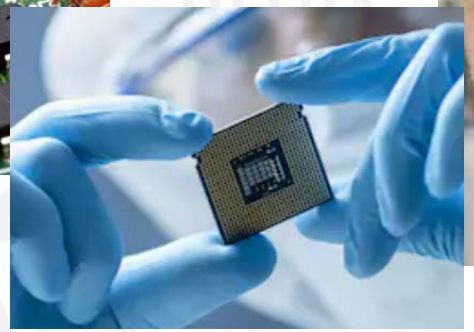
- ✓ Miniaturization
- ✓ IC integration
- ✓ Well-established

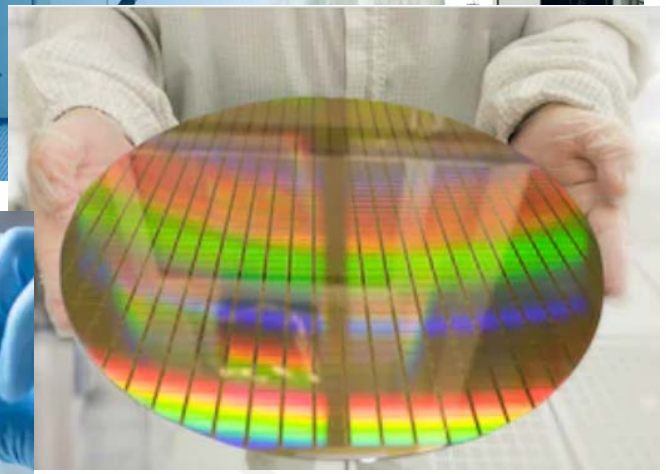
- x Technology cost
- x Fabrication conditions
- x Sustainability



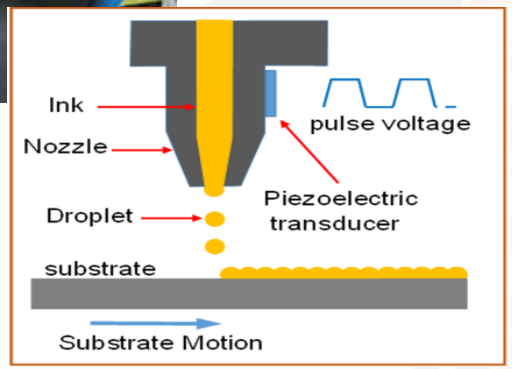


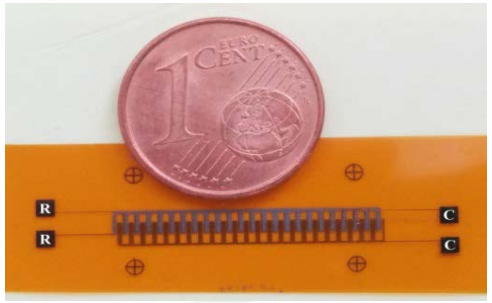


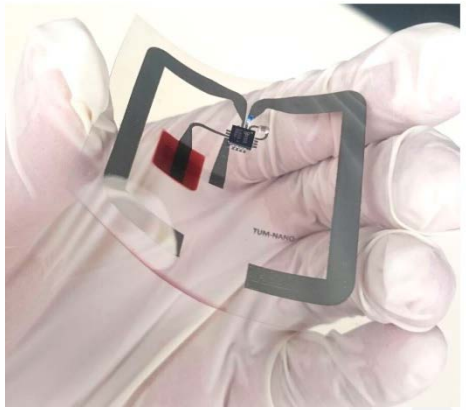




Technology in the IoT







Printed Electronics

Traditional printing techniques

- ✓ Environmental friendly
- ✓ Large scale: Low-cost and ease of redesign
- ✓ Flexible substrates

- x Size
- x Low performance

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Hybrids electronics

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Contributions

1. Title: **UHF Printed Sensor for Force Detection**. Presenter: **Almudena Rivadeneyra**

2. Title: **Screen Printable Electrochemical Capacitors on Flexible Substrates.** Presenter: **Francisco J. Romero**

3. Tilte: **Low-Cost Energy-Autonomous Sensor Nodes Through RF Energy Harvesting and Printed Technology**. Presenter: **Fernando Moreno-Cruz**

Projection on future challenges

- Mass production of printed electronic devices
- Durability of such devices
- Strategies to integrate emerging processes with conventional ones