Embedded systems featuring innovative microelectronics components based on next-generation devices, highly reliable systems, development of new technologies for energy efficiency, microcontrollers and sensors for biomedical applications and environmental monitoring.
The research of the University of Bologna covers a wide range of issues:

**Modeling & Characterization**
- Modelling and simulation aspects of micro/nano-electronic devices: simulation based on semiclassical microscopic transport models of nanoelectronic devices and quantum numerical simulation of nanoelectronic devices
- Organic/inorganic semiconducting materials and devices with applications on wearable devices, realized on non-conventional substrates
- Design of energy harvesting circuits and systems, with a special focus on micro-/nano-power scenarios
- Design of ultra-low power electronic systems
- Applications of piezoelectric transducers for real-time monitoring of physical properties of materials and objects

**Electronic design**
- Innovative systems in health/energy/environmental monitoring, in industrial manufacturing/production and in food/agriculture
- Low power electronics and sensor to fit many application scenarios: design of high-accuracy and low-noise circuit interfaces for several types of sensors; design and characterization of capacitive sensors including custom implementations; design of integrated circuits and MEMS and energy autonomous sensor nodes for IoT; RFID systems; smart metering for smart grid/buildings applications and biosensors and lab-on-a-chip devices

**HIGHLIGHTS**
The University of Bologna is member of the AENEAS - Association for European NanoElectronics ActivityS (Nanoelectronics R&D partners in the ECSEL JU). At national level, it is member of IUNET - Inter-University Consortium for Nanoelectronics and of the Mirror Group ECSEL ITALIA. The inter-department research center ARCES focused on Nanoelectronics, Microsystems and IoT hosts the ARCES-ST joint Lab, the industry-academia joint laboratory with STMicroelectronics Italia.

**European funded projects**
Partner of the following H2020 ECSEL projects:
- **R2POWER300** - Preparing R2 extension to 300mm for BCD Smart Power (2015-2018)
- **R3-PowerUP** - 300mm Pilot Line for Smart Power and Power Discretes (2017-2021)
- **WinSiC4AP** - Wide band gap Innovative SiC for Advanced Power (2017-2020)
- **CONNECT** - Innovative smart components, modules and appliances for a truly connected, efficient and secure smart grid (2017-2020)
- **REACTION** - first and euRopEAn siC eigTh Inches pilOt liNe (2018-2022)
- **AI4DI** (2019-2022)
- **iRel40** - Intelligent Reliability 4.0 (2020-2023)