

Smart Cities and the Internet of Things

Smart Cities

The way we live has been changing quickly under the influence of the information era technologies. The cities in which we live are the next fated to follow the revolution. *Connectivity* is becoming ubiquitous to modern cities and the foretold massive deployment of *sensors* will soon enable us to interact with our urban environment using the same tools we now use to access information. Policy and decision makers will be supported by data of unprecedented magnitude.



Internet of Things

The *Internet of Things* will allow objects to interact with each other just the way people now interact over the Internet. Devices, appliances, machines, houses, and buildings are quickly incorporating the technological offspring of Wireless Sensor Networks to become *Smart Things* that are able to adjust their behavior in order to spare resources and to improve usability.

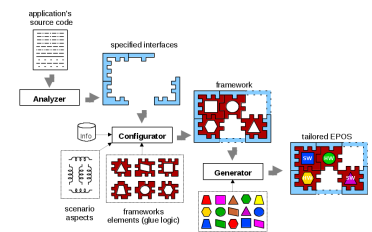


The Role of LISHA

UFSC's Software/Hardware Integration Lab was founded in 1984 to promote research in the frontiers between hardware and software. Since then, the lab has been carrying on research activities that now makes it a key partner on the pursue of *Smart Cities*.

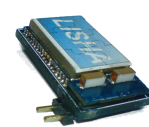
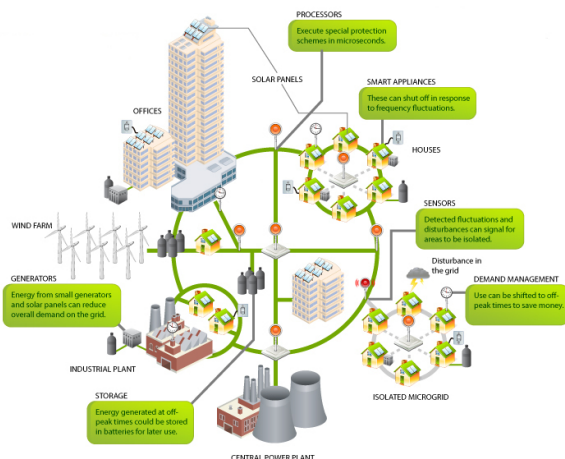
ADESD and EPOS

LISHA's major research back-plane, the *Application-driven Embedded System Design* (ADESD) methodology guides the development of embedded systems as aggregate of adaptable HW/SW components. EPOS, its best show case, has been ported to several architectures and now supports innumerable applications.



Smart Cities on the SmartGrid

The way we produce and distribute electricity has remained mostly unchanged since Telsa's time. However, the recent recognition that natural resources are being depleted faster than the planet can replenish them drove us toward more *sustainable* strategies. The *SmartGrid* combines ICT and EE technology to improve the power grid efficiency and to enable distributed generation, the key to the integration of *clean energy* sources. The underlying technology shares many aspects with that for *Smart Cities*. Addressing both challenges at once will certainly optimize the endeavor.



EPOSMote

EPOSMote is an *IoT mote* specifically designed to run EPOS. The *free hardware* platform is now being used by several universities.

CIA²

LISHA is currently co-leading the CIA² research network, which encompasses 18 Brazilian universities on the quest for Smart Cities infrastructure and applications.

ALTATV

LISHA led the research network that developed the ALTATV Open Free Scalable Access Terminal Architecture: the link between the *Smart Home* and the Internet.

Photovoltaics Lab

A joint venture with UFSC's Photovoltaics Lab established two key deployment cases for LISHA's technology: *Smart Buildings* and *Electric Vehicles*.

Broadband Internet

Broadband internet access is another key-stone for *Smart Cities*, providing the pathways for data acquisition and service supply. In particular, digital media services are being quickly incorporated into both the Internet of People and the *Internet of Things*: IPTV, VoD, monitoring, and surveillance are just the triggering apps of an unforeseeable list of services.

