A quiet revolution – redefining sense and control networks

We are all too familiar with sensors, in particular temperature sensors, but of course also with motion sensors, carbon monoxide sensors or what about parking sensors? Actually let's realize: sensors are everywhere. But thinking about this, we are also familiar with controllers – for instance the thermostats in our living rooms are a combination of a sensor and a controller, switching on or off the heater of our central heating system. We also are aware of motion sensors that switch on a lamp when motion is detected. Actually such a sensor is usually called an actuator, for obvious reasons. In that "sense": actually every switch, whether a light switch in our homes or for instance on the dashboard of our cars essence are actuators.

Up till the day of today sensor networks are usually wired, but with the arrival of the IEEE 802.15.4 radio standard (ZigBee) wireless sensor networks are starting to make their entry, although with some hesitation. The main reason for this hesitation is the fact that contrary to Wi-Fi or Bluetooth networks, sensor networks create a maintenance problem. With a little bit of discipline one can keep a laptop, a cell phone or a Bluetooth headset charged. But talking about sensor networks, replacing or recharging batteries of tens, hundreds or even thousands of sensors would be a nightmare. Fortunately nowadays sensors and actuators using energy harvesting or allowing for decades of battery life are solving that problem enabling maintenance free sensor networks.

"Maintenance free wireless control networks" is the quiet revolution that is going to help redefine what a sensor is. In the future we can expect many sensors, controllers and actuators to be connected with each other and over the internet and helping us to better understand and influence our environment, avoiding the waste of energy, while at the same time increasing comfort and safety. In this sense: cars with their sensors and actuators are already a pre-cursor to this revolution and the expectation is that many of the conveniences in our cars will migrate into our homes, like central door locking or climate control per seat.

Interestingly the dashboard in a car has a central control function and is part of the "car network". In our homes we have the equivalent of this "dashboard", although it is still relatively primitive: it is called a "remote control", usually to be used for controlling television or audio equipment – although there are already remote controls that can do much more than that. One of the practical situations today however is that remote controls are not part of a network, but just a wireless (infra-red) extension of a piece of equipment. The consequence is a well-known and big annoyance: the number of remote control floating around in the living room or anywhere else in the home is (mildly expressed) quite inconvenient.

It took a few years, but last week it seems that consumer electronics companies are getting a wake-up call, deciding to work together to establish an interface standard on top of IEEE 802.15.4 allowing to have different remote controls to start interacting with different types of equipment. This would be a big step forward, as this would be the first step to reduce the number of remote controls by allowing one remote control to start support other types of gear as well – make it more compatible with the concept of a dashboard.

So, all of a sudden, an innocuous piece of electronics called a remote control gets to the center of a concept called sense and control networks and becomes a key player in a quiet revolution. But in all fairness: was the remote control not already a remote sensor of our television anyhow?

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