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Abstract:
Many modular platforms have been developed to facilitate the design and implementation of smart sensing systems. Modular platforms can be of great benefit for system prototyping but the way they were initially designed can also limit the possibilities of building and testing new concepts. In a time where smart and ubiquitous sensor systems are of increasing interest, allowing to have the sensor's data available always and anywhere, it is also of great importance knowing what are the main features a sensing platform should have to allow the development and fast prototyping of new innovative sensor based systems. This article focuses on the architectures commonly used by modular and portable sensor platforms, discussing some practical implementations. At the same time is presented a new architecture characterized by high flexibility avoiding smart sensor's redesign each time a new communication paradigm arises.

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☰ Contents

I. Introduction

Sensors are used in a huge variety of sectors and industries namely: environment, agriculture, health, sports, smart metering, industrial processes or logistics. They are the eyes and ears of many machines and allow us to monitor almost everything surrounding us. With the advent of the so called Internet of Things [1] [2] [3] and Cloud based services [4], sensors are becoming increasingly present in our daily lives. While many of the physical quantities measured by sensors have been the same along the time, like temperature, force, motion, environmental or biological parameters, the way those values are collected, stored or transmitted have been changing along the digital era. Nowadays, almost any sensor, mostly still analog, has to have a digital interface that allows any computer, smartphone, tablet or other intelligent electronic device to access its data. This allows sensors to become smart [4] [5]. However, mixing smart sensor's data acquisition and communication firmware can lead to harder maintenance of the code or even a complete redesign if the communication paradox changes completely, for example, from a wired solution to a wireless and networked one.

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