

Sampling Methods for Physiological Signals in Internet of Medical Things Systems

Abstract

Wearable measurement systems have been currently spreading as personal devices for monitoring physiological parameters. In last years, such systems are going to be integrated in Internet of Things (IoT) systems where several acquisition nodes are simultaneously connected and managed. The acquisition nodes must comply the size and energy consumption requirements of wearable devices, while allowing the streaming of sampled signals such as the Electrocardiogram and the respiration wave and providing enough accuracy to guarantee the biosignal integrity. This is even harder when the device is connected to Wide Area Network IoT systems, characterized by a lower bandwidth and a higher power consumption.

To face these problems, efficient sampling strategies can be adopted aiming to reduce the data rate to be transmitted and as a consequence the energy consumption.

The lecture will present the state of art of sampling methods for physiological signals and will in particular deal with methods based on compressed sensing. Compared with the others, such methods offer a lower computational load on the acquisition node, by moving it to the reception side, which in the case of IoT systems, is usually realized in the cloud. The lecture will also present the activity carried out in this field by the Laboratory of Signal Processing and Measurement Information of the University of Sannio, mainly in the framework of the ATTICUS (Ambient-intelligent Tele-monitoring and Telemetry for Incepting & Catering over Human Sustainability) project.