Title: IoTRing: A Trusted bio-inspired Sensing Approach

This paper presents the design and deployment of a bio-inspired, body-worn, medical-grade, gadget-based on a trusted IoT platform, which incorporates a unique biometric ID for each user/patient. This ring-shape communication device is capable of authenticating and authorizing the user biometrically and creating a secure health-tag (H-tag) based on secure keys derived from physiological information, characteristics, data pattern, as well as fusing with other uniquely identifiable information (e.g., date of birth).

This health-based device is more than just an ID tag, which is a design-based complex intelligent system, able to track a number physiological signals (e.g., heart rate, blood oxygen, breathing patterns, stress level, etc.) and characterize and transmit bi-directional data (central agents can also communicate with the end-users remotely). The physiological signal tracking capability is in addition (and complimentary) to the IoT-based universal patient ID/data management capability.

This ring features a number of communication protocols and handshakes with the Unified Smart Hospital Cloud (USHC) and Patient Digital Registry (PDR). This is done directly through the Hospital Cloud Abstraction Layer (HCAL).

The objective of this paper is to present the IoTRing system and associated communication and security protocols and discuss about the current trends and future directions of the Smartphone diagnostics, wearable biosensors space.