Internet of Things Animal Health Services Platform for Precision Farming

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Abstract
The features of an Internet of Things (IoT) inspired platform with the capability to provision of a range of services that promote the adoption of Precision Farming (PF) principles is presented. The platform design targets the provision of dairy animal health services and comprises a robust, wirelessly enabled, high node-count sensor network gathering data from individual animals and a cloud based environment that manages on-farm data to pro-actively inform the supply chain, real time, on key operational and management interventions. The platform is scalable in terms of the number of animals and to farms of any size and has the flexibility to extend its service mix to other non-dairy environments such as beef and crops farming.

The presentation reports on the design of the elements and features of the physical layer and details the methodology of feature extraction from raw acceleration data, a single (proxy) measurement that is the basis for the interpretation of a spectrum of cow states, the statistics of which in turn yield key animal conditions. Accurate indications of the onset of heat, important in increasing the fertility of individual animals and hence the overall productivity of dairy farms and the time spent eating and ruminating, both indicators of health state are provisioned.

Keywords: Data-Driven Applications/Services; Distributed Intelligent Sensor Networks and Applications; Internet of Things Technologies; Low Power Wireless Connectivity; Edge Computing; Machine Learning; Accelerometers; Precision Farming