IoT in Agriculture for the Implementation of Livestock Farming: A Systematic Literature Review

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Abstract

The world population is growing very fast and with this increase, the need for food has been increased briskly. With the advent of the Internet of Things (IoT) technology, this era is witnessing a shift from traditional farming methods to advanced approaches. IoT is an emerging paradigm that connects different smart objects physically by using the best smart farming practices for the modernization of the livestock industry. Several IoT-based solutions have been introduced to automatically monitor, track, and manage livestock farming with minimal human intervention. This systematic literature review (SLR) presents a comprehensive discussion on major IoT-based livestock applications, state-of-the-art sensor/devices, communication protocols, and new multidisciplinary technologies. The SLR has been compiled by reviewing the research studies published between 2016 and 2022 in well-reputed databases. A total of 879 papers were identified systematically out of which 30 were selected and classified accordingly. Furthermore, a rigorous discussion on relevant technologies such as machine learning, big data, cloud computing, and artificial intelligence has been presented by developing network architecture, topologies, and platform. Besides, we have presented open issues as well as security challenges and discussed a use case for an IoT-livestock health monitoring system (IoT-LHMS) for key management and end-to-end secure communication among nodes and gateway. In the end, we proposed an IoT-enabled livestock management taxonomy based on major components and presented future research directions

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