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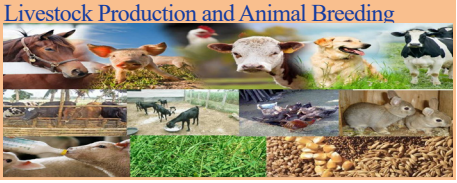

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A new animal welfare smart farming applications

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DESCRIPTION

Animal welfare is a broad term, used differently by different research associations, based on species and context. Consequently, different types of work address issues of welfare in different ways. For pets like dogs and cats, animal welfare considerations almost always involve some kind of knowledge and feelings as well. For farm animals, on the other hand, and especially in the context of smart farming and Precision Livestock Farming (PLF), animal welfare is used to refer to animal health as an indicator of production. Although some of the most important features such as fire safety and water intake are considered, their sole purpose is product utility. Since animal health is crucial to animal-based food production, it is in the general interest of commercial farm organizations and animal welfare professionals to monitor the health of the farm animal during its life cycle. However, at the same time, there are no studies in smart farming to understand the cognitive needs and social behavior of farm animals in relation to their overall health, their response to a positive stimulus in their environment, or their interactions with humans. Apart from a few exceptions, there is a lack of work research on smart technologies that can address living quality issues and animal welfare of farm animals. Our previous review on smart technologies for animal welfare revealed the maturity and existence of various technologies used to monitor the physical health of farm animals, which is not the focus of this paper (Bonomi, et al., 2014; Brugarolas, et al., 2013; Jukan, et al., 2014).

Smart farming refers to plant-based and livestock farming, which uses networking, computing and sensing as basic technologies to improve food production processes. As in other business and social sectors, networked devices for wearable computing, wireless sensor networks and cloud-based sensing and monitoring are now a part of modern agriculture. Most smart farming systems and applications are primarily developed to serve large corporations and large farms and not to individual farmers in small settings. Also, their goal is primarily to improve production indicators such as feed control systems automation, automatic climate control of farm buildings and early detection of diseases in animals. Very little work has been done on smart farming on the issue of animal welfare, indicating that animals are healthy and pain-free, both physically and cognitively positively stimulated in their environment. Smart farming systems today completely ignore animal-human interactions or animal-social interactions within farm animal groups (Banhazi, et al., 2012).

Overall, although considerable effort has been made in Precise Livestock Farming (PLM) to use smart technologies in the broader context of animal health, this focus is primarily on the production indicators of animal products. There are already many challenges that lead to a lack of priority to animal welfare and their cognitive development through interactions with humans and each other. First, although large amounts of general data are collected on farms through various expensive sensor systems from proprietary commercial products, this data is primarily sector-based and species-specific and

may not be used in a coordinated or holistic manner. Second, despite the legal requirements in many countries to use animal-based indicators for the evaluation of farm animal welfare, it is very difficult to maintain a practical, reliable, low-cost and real-time assessment. Third, tracking welfare issues on farms involves multiple factors and dimensions and the holistic solution must take into account not only the farm environment and behavior but also a wide range of factors such as animal transport, air and water pollution and the global climate. Fourth, despite the proven value of animals that need to deal with limited space and confinement, technologies for animal enrichment opportunities to satisfy their cognitive needs have not been used in agricultural settings. Needless to say, limited space and dark confines do not adequately challenge the cognitive and sensory needs of animals. Finally, the knowledge that a farm is taking extra steps to carefully monitor the welfare of its livestock will be made available to the interested consumer, although ways to collect and disseminate this information are not yet available [Bracke, et al., 2016].

One of the biggest animal welfare issues in animal husbandry is the lack of ability to perform open experiments and scale, understanding the complex correlation of various parameters that lead to animal behavior that is unusual or adapted to animal welfare factors. The first problem we recognize is our collective inability to create systems that can share and analyze data on a scale; this is the gap we want to narrow down our pro-posal as it is often argued that economic factors are the main reason why farm animal welfare is not financially justified. On the other hand, the low-cost and open sys-tems presented here based on Raspberry have a lot of passion for robustness and multinational compliance. We found that GPS and accelerometer collars could be easily placed and mounted on cows, but such applica-tions on pigs require less sensor sensing (i.e. without wearable sensors) and image and sound processing elements of sensors embedded in their environment. Also, pigs must correlate data collected from multiple sources (building, air, human existence, etc.) to reach clear conclusions about their position and behavior (tail biting, fighting, eating, and playing). The lack of open data and data on the scale compromises our under-standing of animal well-being and, if we rely on person-al experiments, end up ending up severely damaging the quality of life of the animals moving forward. It is easy to implement a simple and low cost system with its connection to cloud-based data analysis on a scale. In this way, we can evaluate whether the animals have adequate roaming space, healthy environment and air quality, as they are usually seen as important welfare factors. These parameters can be easily measured in our systems and can detect thresholds without any ma-jor effort and enable farmers to work actively despite the ease of use of mobile applications. Such an ap-proach can be applied in current PLF technologies with special consideration of animal welfare factors, which not only lead to better physical and mental health of the animals but also reflect through their socializations and group behavior. It should be noted once again that economic factors and production indicators are cur-rently driving technological innovations in this field. At the same time, with the current advances in computing and networking, a better understanding of the complex relationship between humans and animals and the social behavior of animals in the general population can be provided easily and without additional cost, at a lower cost and publicly.

CONCLUSION

A novel smart farming system based on the concepts of openness, transparency and data sharing for all stakeholders with a broad scrutiny of animal welfare. Developed and implemented our system using the nov-el computing and sensing framework, including cloud and fog computing, and the novel SmartHof, a mobile and cloud-based application that seamlessly launch-es animal care features at its core. Our approach is in stark contrast to existing smart farming systems and applications that are not available for experiments and are highly proprietary. Our goal is to promote further research on animal welfare in the agricultural animal sector and to inspire computer scientists and comput-er engineering professionals with great potential for technological innovations in this field. Further research needs to be done on the novel computing architecture, wearable as well as smart and collaborative data shar-ing and correlation. Smart technologies for farm ani-mals, which will benefit not only animals and farmers, but also consumers, veterinarians, policy makers and citizens.

REFERENCES

Bonomi F, Milito R, Natarajan P, Zhu J (2014). Fog computing: A platform for internet of things and analytics. Big. Data.Int. thing.169-186.

Brugarolas R, Loftin RT, Yang P, Roberts DL, Sherman B, Bozkurt A (2013). Behavior recognition based on machine learning algorithms for a wireless canine machine interface. IEEE. 1-5.

Banhazi TM, Lehr H, Black JL, Crabtree H, Schofield P, Tscharke M, Berckmans D (2012). Precision livestock farming: an international review of scientific and commercial aspects. Intern. J. Agric. Biolog. Eng. 5(3):1-9.

Bracke MB, Hopster H (2006). Assessing the importance of natural behavior for animal welfare. J. Agric. Environ. Ethic.19(1):77-89.

Jukan A, Masip-Bruin X, Amla N (2017). Smart computing and sensing technologies for animal welfare: A systematic review. ACM. 50(1):1-27.