



A Computer Vision System for Improving Cattle Feed Bunk Management Efficiency

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The Wisconsin Alumni Research Foundation is seeking commercial partners interested in developing a computer vision system to integrate information on feed availability and livestock presence at the feed bunk to more efficiently manage feeding operations at beef and dairy facilities.

Overview

In both beef and dairy livestock production facilities, feed bunk scoring and decisions about when to deliver feed are almost exclusively determined by visual assessment by trained staff. This is a highly subjective and variable process that can result in feed waste, sub-optimal animal performance and increased incidence of metabolic disorders.

The Invention

UW-Madison researchers have developed a computer vision-based system that functions to automate and standardize the process of delivering feed, thereby reducing labor costs and improving feeding efficiency and cattle performance.

This computer vision-based system is comprised of three core components: 1) a networked imaging system for collection of information relating to feed and cattle quantities at the bunk, 2) a deep learning algorithm for generating predictions based on the collected images, and 3) generation of a feed delivery recommendation.

In the networked imaging system, cameras placed at different locations in the bunk collect images that are sent to the deep learning algorithm over a network connection. The deep learning algorithm characterizes both the feed and cattle levels as full, half, low or empty. The characterized images are processed to note whether the feed bunk is in a “green flag” (e.g., full bunks and full cattle) or “red flag” (e.g., empty bunk and half cattle). Based on the characterization, a recommendation is then made and sent to the manager.

Animal feeding patterns can also be predicted based on accumulated data, such that “red flag” situations are remedied before they even occur. This system can be combined with local or on-site weather monitoring, which would enable determination of whether to adjust feed delivery (e.g., if there is a “red flag” situation but a severe rain event is about to occur that could lead to feed spoilage), and can be optimized for local conditions.

Applications

- Interpretation of feed levels and cattle presence to alert producer in real time of feed bunk status
- Can integrate a weather monitoring system to assess and predict situations that will affect feed quality and feeding behavior

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- Reduces on-farm labor requirements
- Reduces feed costs by preventing waste from spoilage

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- Improves animal welfare by limiting hunger-related stress
- Streamlines and simplifies feed management by automatically making recommendations in real time

Stage of Development

The development of this technology was supported by WARF Accelerator. WARF Accelerator selects WARF's most commercially promising technologies and provides expert assistance and funding to enable achievement of commercially significant milestones.

This computer vision system has been implemented on multiple feedlots and is continually being refined.

Additional Information

For More Information About the Inventors

- [Guilherme Rosa](#)
- [Joao Ricardo Reboucas Dorea](#)

Publications

- [João R R Dorea, Sek Cheong, PSXI-2 A computer vision system for feed bunk management in beef cattle feedlot, Journal of Animal Science, Volume 97, Issue Supplement 3, December 2019, Pages 389–390, <https://doi.org/10.1093/jas/skz258.776>](#)

Tech Fields

- [Animals, Agriculture & Food : General agriculture technologies](#)

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