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Farm animal facial recognition

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Farm animals like pigs, cows and sheep exhibit different unique personalities and behaviors, like us humans. They handle various types of stress or challenges differently. When they are stressed, they tend to become less productive and more prone to diseases. This is why farmers want to keep an eye on each animal's health and welfare to notice any potential problems early on and provide them with the best care possible.



Animal welfare is evaluated by checking out different signs that can give us an idea about their health and emotional state. These signs include observing their behavior and taking samples of blood, saliva or faeces. We can tell if an animal is feeling good or not by subtle changes in facial expressions like a wrinkled nose or flattened ears. There are different scoring systems

to measure these behaviors, like the [Pig Grimace Scale](#) or the [Cow Pain Scale](#), but sometimes bias or errors remain. Moreover, with so many animals on a modern farm, with relatively few farm workers, it is not feasible to monitor each one manually.

To avoid subjective analysis, biomarkers like cortisol, immunoglobulin, or microbiome profiles that can [reflect the underlying pathophysiological responses to stress](#) are measured. These biomarkers can reveal the underlying physical responses to stress and can predict health outcomes. However, collecting these samples can be stressful for animals, especially when drawing blood, and requires a significant amount of work for farm workers and researchers.

To combat this, researchers have identified a new way to study the behavior of cows and pigs! They use facial recognition and machine learning to track the animals' movements, with webcams mounted above their pens. This uses a type of Deep Learning called Convolutional Neural Networks (CNN), which [analyses video footage of pigs](#). The AI is trained to recognize

each animal by face, ears, and coat markings. Then, it tracks how often they eat or drink, where they go in the pen, and how they interact with others. The Pig Grimace Scale is then used to figure out the animals' emotional state! By combining this information with other data about the animals, like their genetics, breeding and health history, biomarker status, or microbiome, they can figure out which animals are doing well and which might need help.

This technology can provide early alert systems for farmers, allowing them to quickly solve problems related to animal health. The CNNs used in these systems can integrate different data types for a more robust classification. It can also be used as a research tool to improve farming practices for sustainable and ethical food production.

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