

Creating Resilience in Pigs Through Artificial Intelligence (CuRly Pig TAIL)

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The pig provides a huge amount of health and welfare information by its behaviour and appearance (e.g. lying, eating, skin colour, eye colour, hair coat and tail-posture). By careful observation of this body language we believe it is possible to identify (early) signals of discomfort, upcoming disease and undesired behaviour. By early detection of these signals interventions can be carried out in an earlier stage than currently is done to restore health and welfare of the pig herd. Good health and welfare is the foundation of high resilience in animals, which makes them less vulnerable for disturbances (e.g. infections). For a farmer it is, however, impossible to continuously monitor the body language and behaviour of every pig on his or her farm. By using a combination of non-invasive techniques to collect signals from the pigs and their housing environment (e.g. a camera and a water meter) the pigs can be observed 24/7. By combining computer vision and pig knowledge using machine and deep learning techniques, a non-invasive monitoring system can be designed. Deep learning is the current state-of-the-art machine learning approach for computer vision that is especially powerful in recognising and localising image content, e.g. the location of the body parts or visible abnormalities thereof. Deep learning is based on large convolutional neural networks and require a large amount of manually annotated training (image) data. Ultimately with this approach the robustness of pig husbandry systems is increased due to better health and welfare conditions for the animals. Additionally, our approach could even lead to a new design of pig housing systems. Furthermore, it increases the job satisfaction of the farmer. Our ambition is to develop advanced monitoring systems that allow to stop tail docking all together, so the curly pig tail becomes once again a common phenomenon on pig farms. To achieve this ambition, we will explore, co-develop and test non-invasive monitoring technologies for pig husbandry.