

iCount: An Automated Swine Detection and Production Monitoring System Based on Sobel Filter and Ellipse Fitting Model

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Abstract : The use of technology has become ubiquitous in different areas of business today. With the advent of digital imaging and database technology, business owners have been motivated to integrate technology to their business operation ranging from small, medium to large enterprises. Technology has been found to have brought many benefits that can make a business grow. Hog or swine raising, for example, is a very popular enterprise in the Philippines, whose challenges in production monitoring can be addressed through technology integration. Swine production monitoring can become a tedious task as the enterprise goes larger. Specifically, problems like delayed and inconsistent reports are most likely to happen if counting of swine per pen of which building is done manually. In this study, we present iCount, which aims to ensure efficient swine detection and counting that hastens the swine production monitoring task. We develop a system that automatically detects and counts swine based on Sobel filter and ellipse fitting model, given the still photos of the group of swine captured in a pen. We improve the Sobel filter detection result through 8-neighborhood rule implementation. Ellipse fitting technique is then employed for proper swine detection. Furthermore, the system can generate periodic production reports and can identify the specific consumables to be served to the swine according to schedules. Experiments reveal that our algorithm provides an efficient way for detecting swine, thereby providing a significant amount of accuracy in production monitoring.

Keywords : automatic swine counting, swine detection, swine production monitoring, ellipse fitting model, sobel filter

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