Supplementary for the Material and methods

explanation of the query formula

The combination of criterion “cattle” and criterion “3D vision” maximised the search results with WoS search syntax “AND”, and then the combination concatenated criterion “exclusions” through WoS search syntax “NOT”, shrinking the research fields of these results in the searching process. Criterion “cattle” describes the research object in three terms, and criterion “3D vision” explicitly includes a variety of techniques to ensure that the survey would not miss any related research. In contrast, the criterion “exclusions” includes specific research fields that would be excluded from the research records to guarantee that the survey would concentrate on cattle management.

dimensions of outcomes

The outcomes were collected in a few dimensions, including a) the article: encoded title, citation number, primary author, year, and type of article; b) the acquisition: sensor parameters, platform traits, environmental conditions, cattle characteristics, acquisition issues, and ethical rules; c) the pre-processing: basic filters, optional filters, point clouds construction, and features extraction; d) the growth management tasks: management tasks, existed techniques, dataset, data division, ground truth, models, evaluation, training source, neural networks and analysis.

steps of forming Supplementary sheets

We formed the sheets in two steps. Firstly 47 studies in Supplementary 1 were grouped by article type, including books, review papers, and task-oriented papers. Then, data in task-oriented papers were pivoted into task-oriented sheets (Supplementary 3) and essential-oriented sheets (Supplementary 4), depending on the data dimensions. While dimension d was exported to task-oriented papers, the others were exported to essential-oriented sheets.