ShinyAnimalCV: interactive web application for object detection and three-dimensional visualization of animals using computer vision

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INTRODUCTION

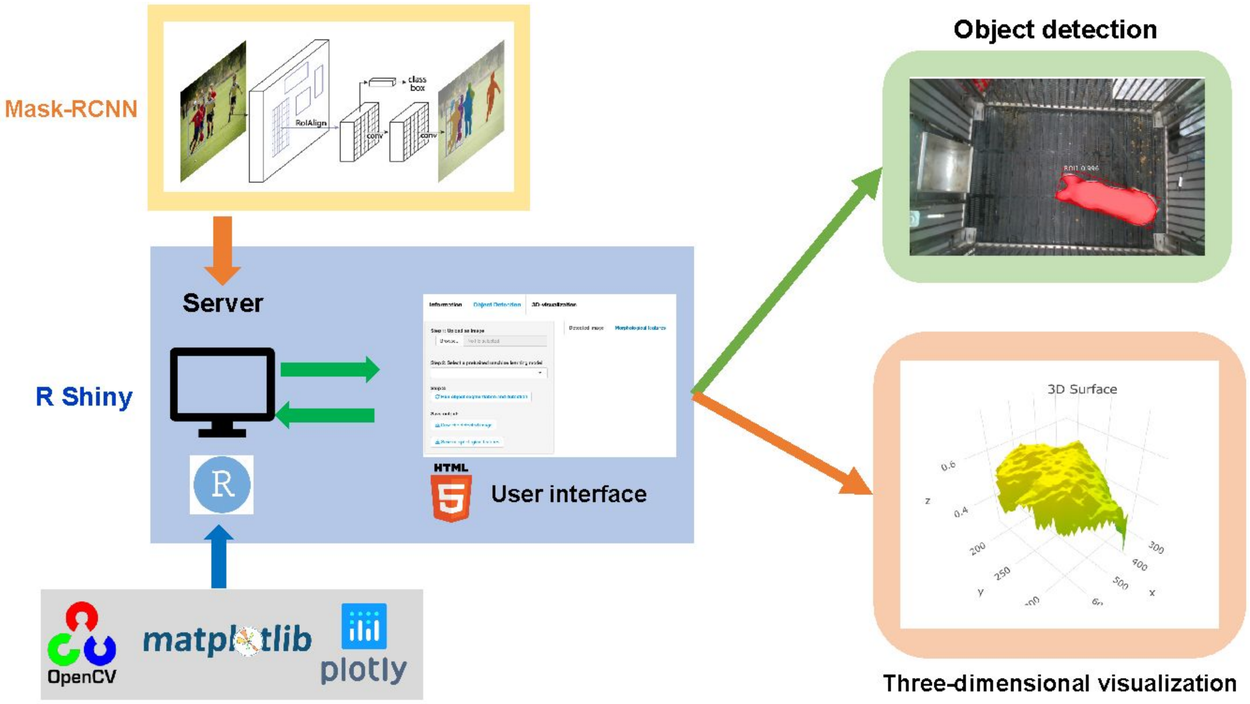
Advance in camera sensors provides a great opportunity for producers to improve animal health and welfare sustainably. However, the limited availability of user-friendly image data processing software tools substantially hinders the implementation of computer vision in livestock production systems.

OBJECTIVE

The objective of this study was to develop ShinyAnimalCV, which is a Shiny-based interactive animal computer vision web application. This software tool offers a user-friendly graphical user interface for object detection and three-dimensional visualization.

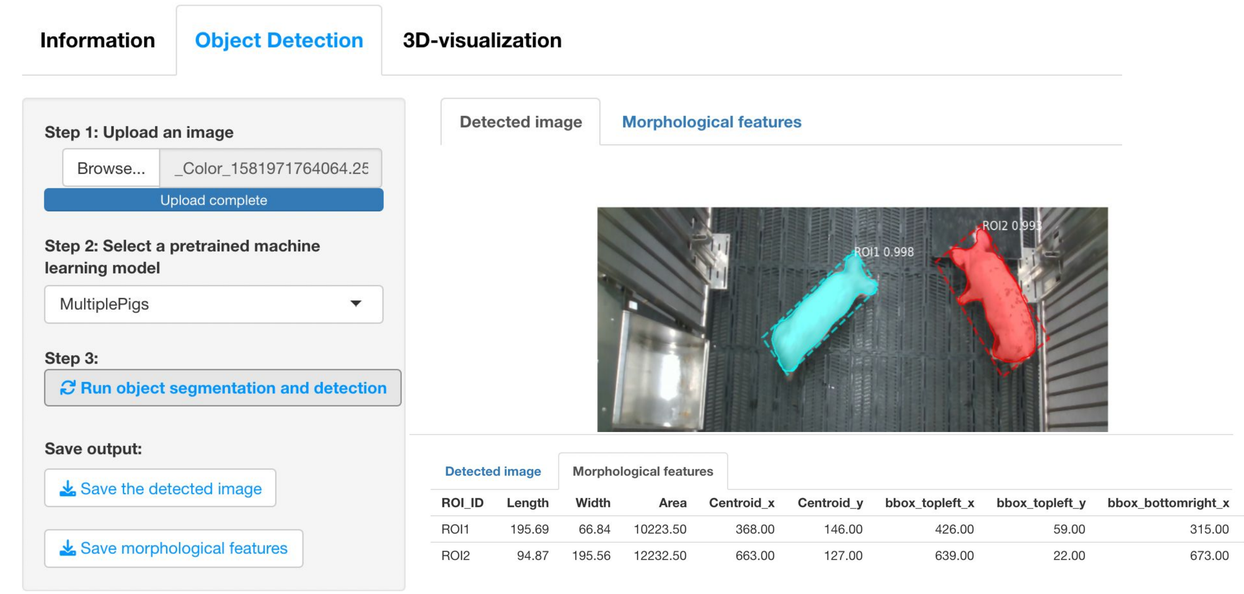
MATERIALS AND METHODS

Overview of Software Architecture



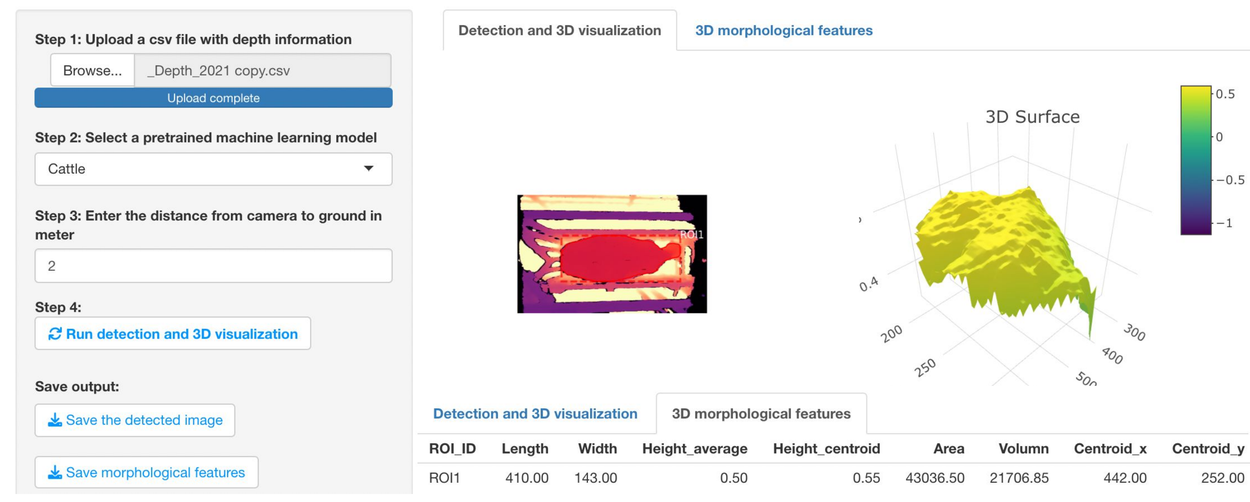
RESULTS

Object Detection



ROI_ID	Length	Width	Area	Centroid_x	Centroid_y	bbox_topleft_x	bbox_topleft_y	bbox_bottomright_x
ROI1	195.69	66.84	10223.50	368.00	146.00	426.00	59.00	315.00
ROI2	94.87	195.56	12232.50	663.00	127.00	639.00	22.00	673.00

Three-dimensional Visualization



ROI_ID	Length	Width	Height_average	Height_centroid	Area	Volumn	Centroid_x	Centroid_y
ROI1	410.00	143.00	0.50	0.55	43036.50	21706.85	442.00	252.00

CONCLUSIONS

Our newly developed ShinyAnimalCV could facilitate the application of computer vision in the animal science community.