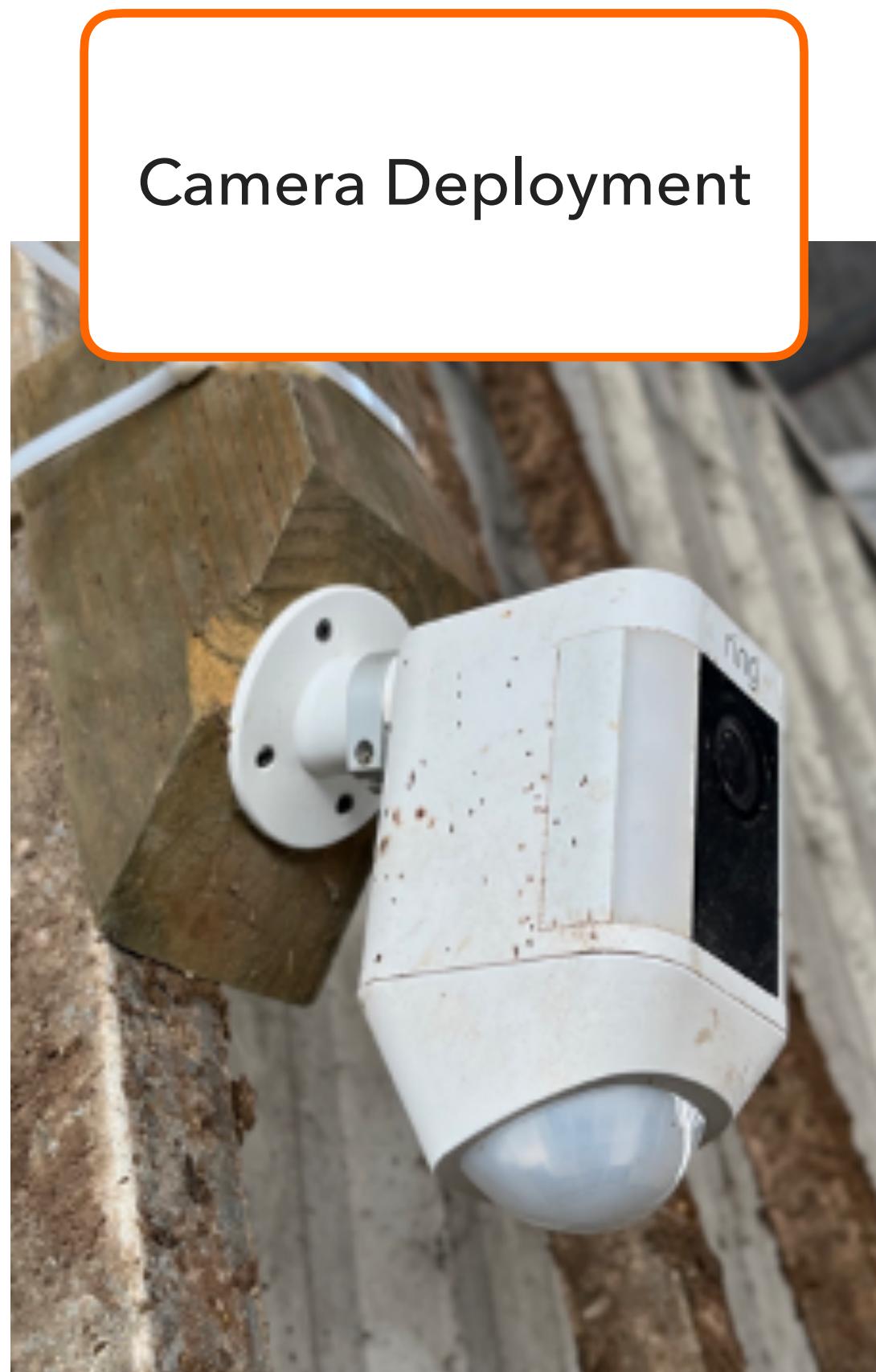
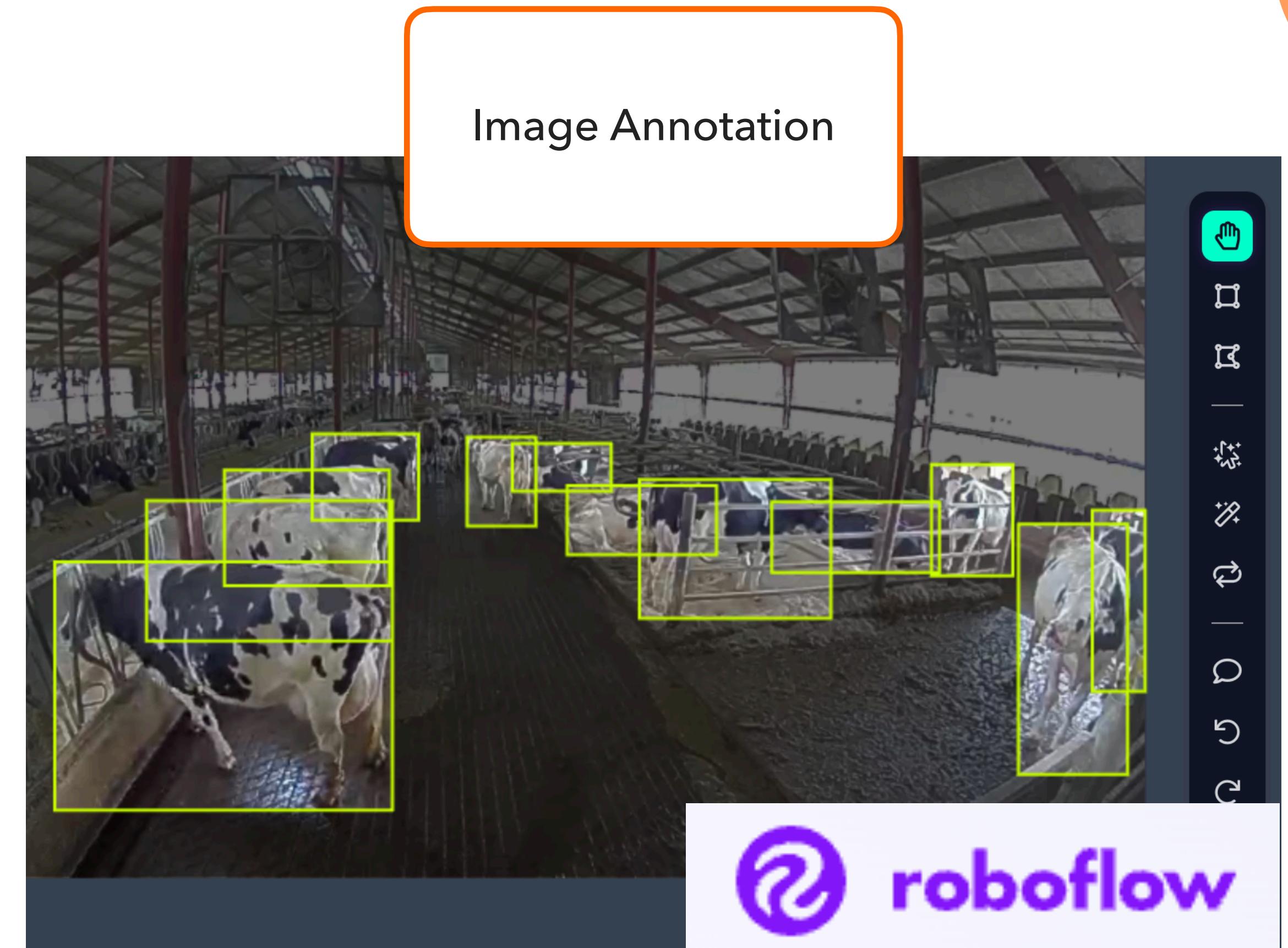
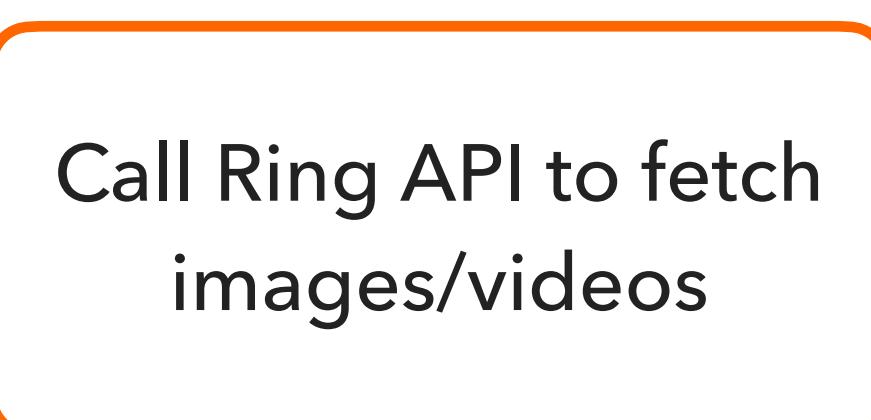


# Data Collection Pipeline



Camera Deployment



The IoT system allows data access through phones, webpages, and customized APIs, but requires Wi-Fi and has a battery life of less than a month.

# Data Management

2

Lighting Condition

Daylight



Top view

Monitoring angle



60-degree sideview

Lower angle  
All Holstein cows



External 1 (US)

External 2 (TW)

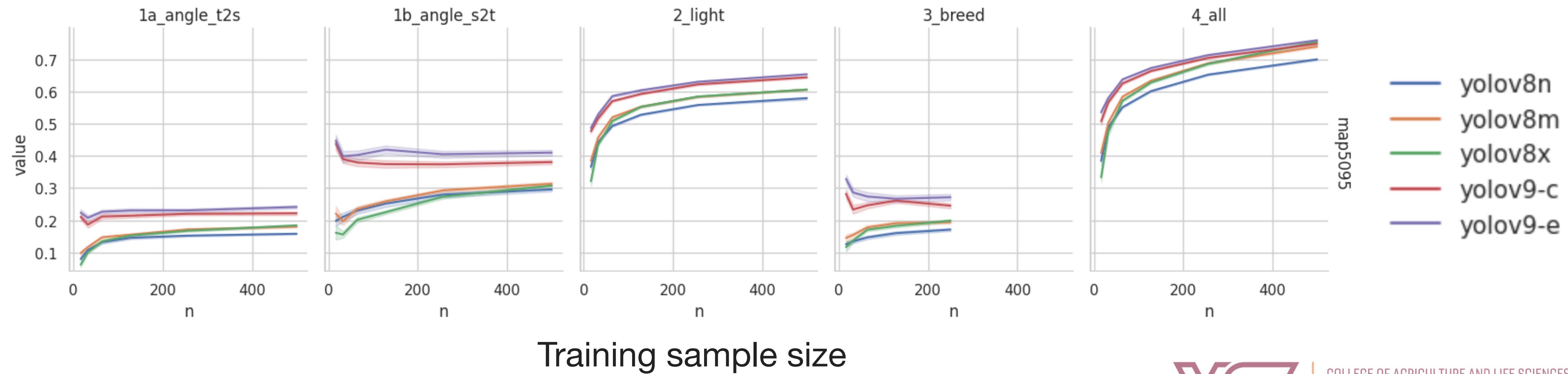
This Collection

# Study From Chen Lab

3

Chen Lab is interested in studying the model's ability to generalize across different fields and farms. The study output includes an open-access dataset in YOLO and COCO formats as well as fine-tuned model weights in PyTorch checkpoint format.

Performance across Different Datasets (column-faceted)



# Experimental Design (Objective 1)

4



# Experimental Design (Objective 1) - Cont.

Lighting Condition

Daylight

Indoor light / NIR

Monitoring angle

Top view

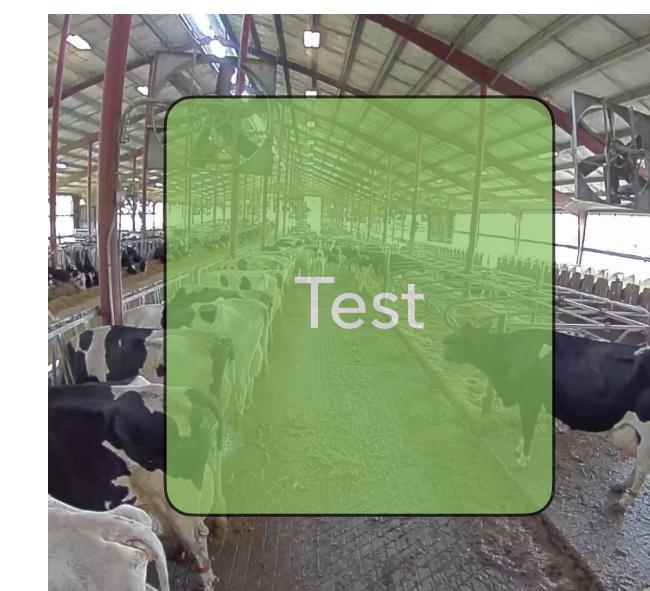
60-degree sideview



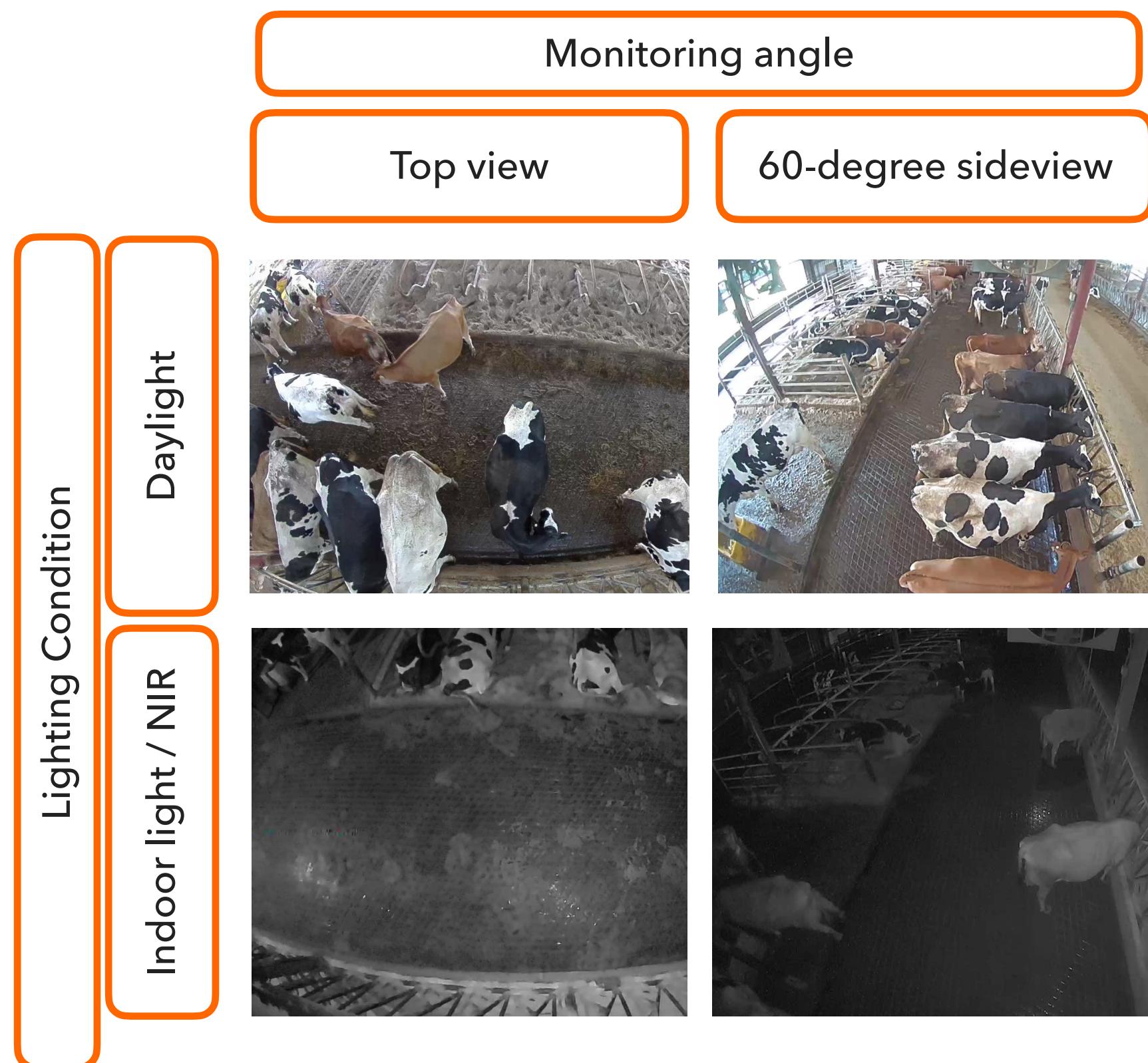
External datasets (250 images)



c\_external



# Experimental Design (Objective 2)



**1\_top (and 2\_side)**

**yolov8\_side\_view.ckpt**

**16, 32, ..., 200**

Unused

Train

Unused

Train

Train

Unused

Train

Unused

Test

Unused

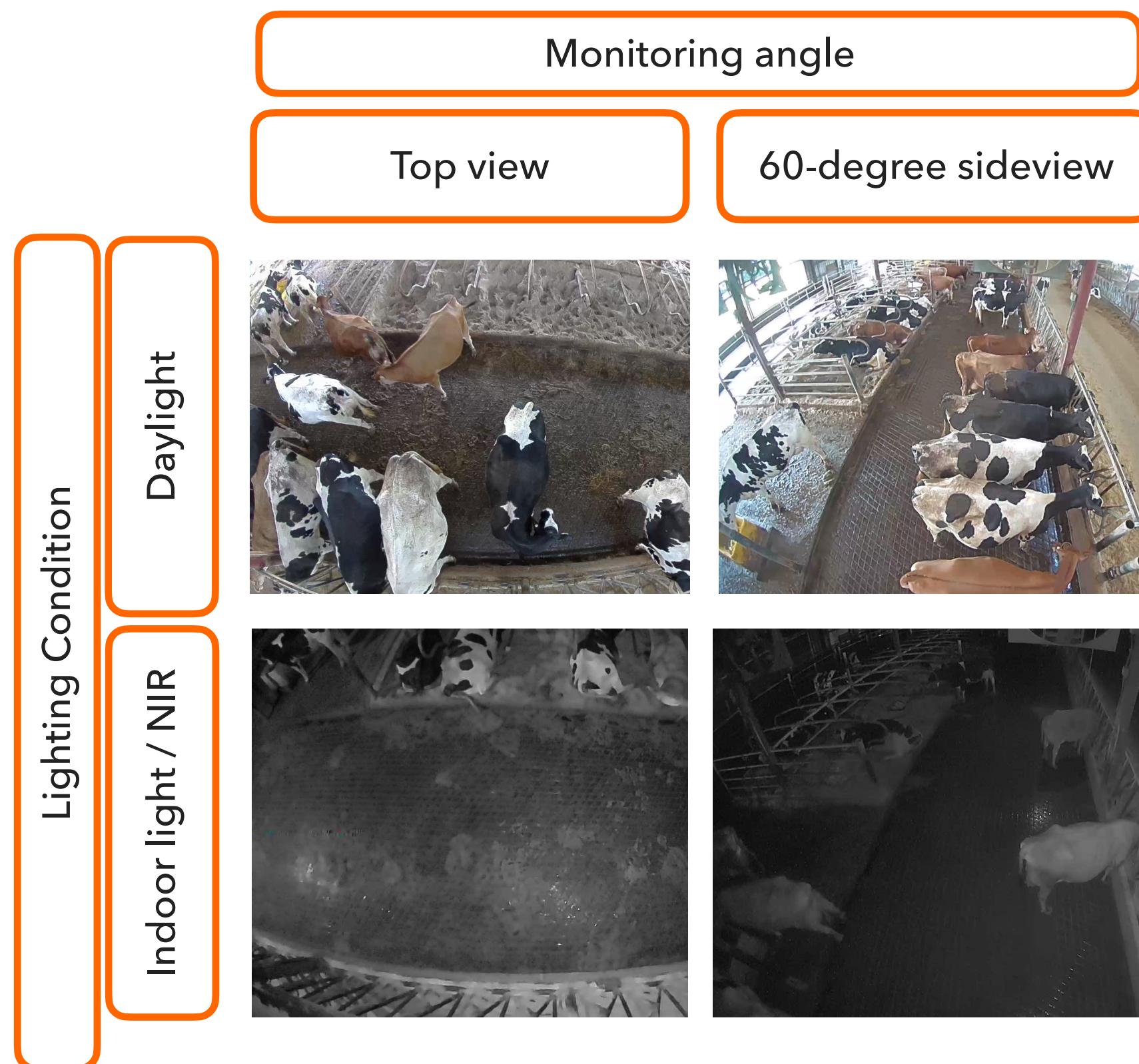
Test

Unused



[yolov8.pt \(COCO\)](#)

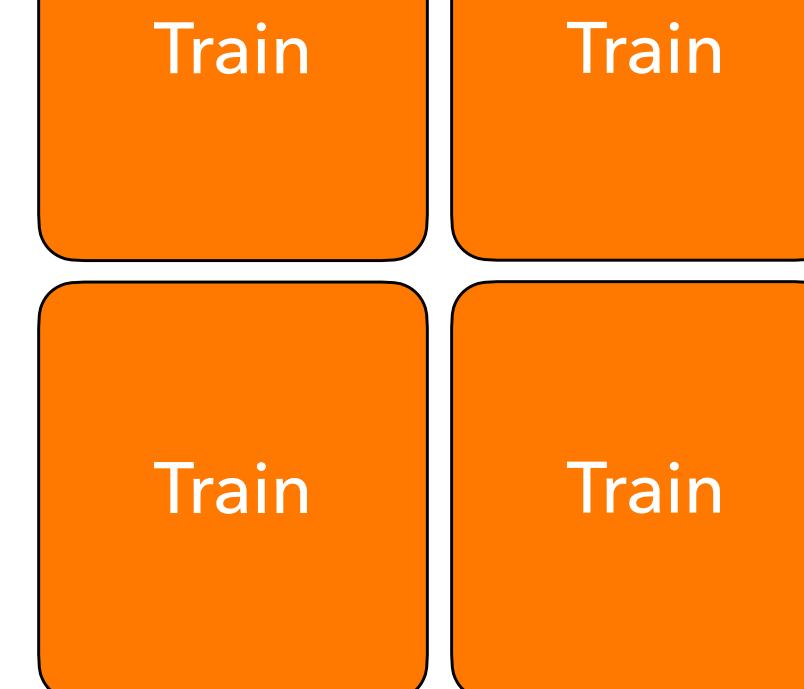
# Experimental Design (Objective 2)



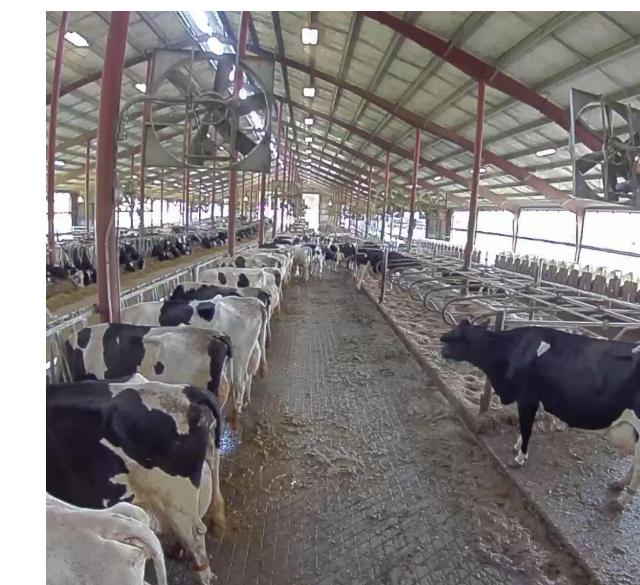
**3\_external**

**yolov8\_all.ckpt**

**16, 32, ..., 200**



External datasets (250 images)



[yolov8.pt \(COCO\)](#)