



Phenotype Tracking Using Computer Vision

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BIF July 2023

BETSY

Bovine Expert Tracking and Surveillance



Bounding Box



Limb Tracking



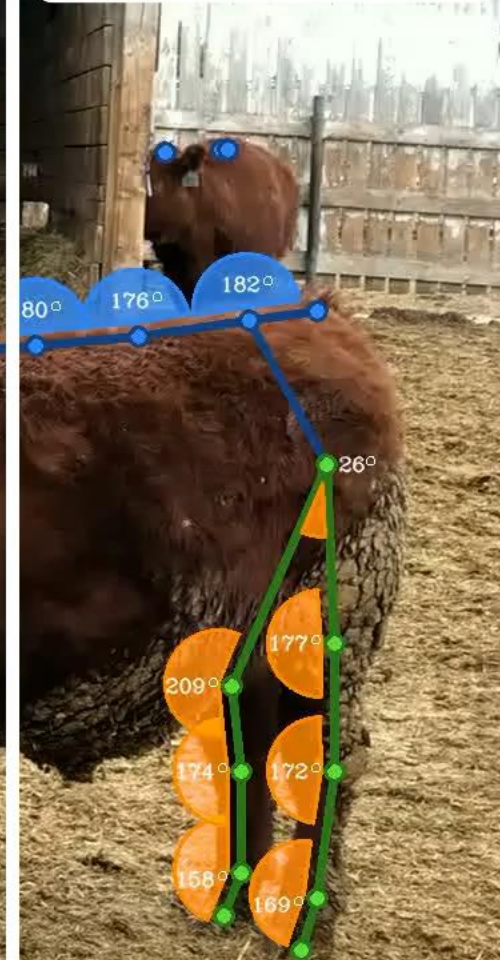
Face - ID



Key Points



Key Angles

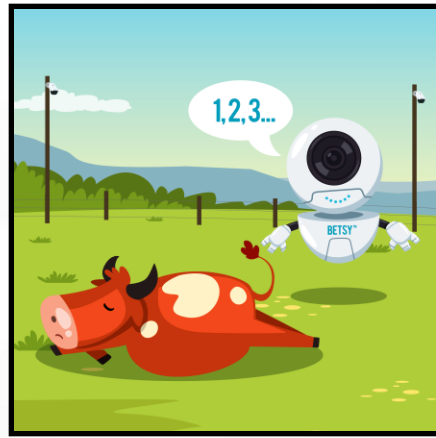


Value Proposition

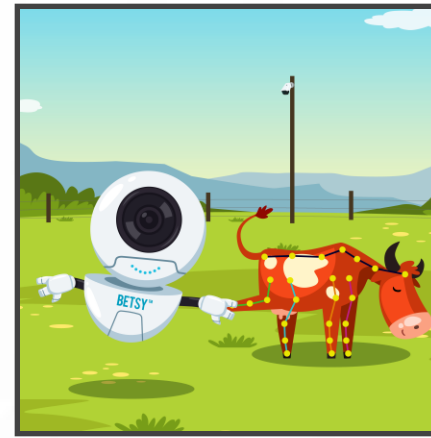
Skills of a Rancher, embedded into a Vision based Artificial Intelligence



Visual ID



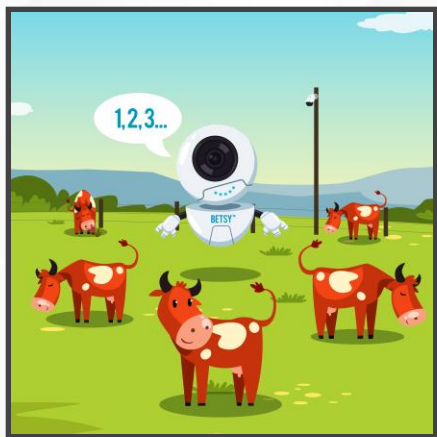
Calving Cam



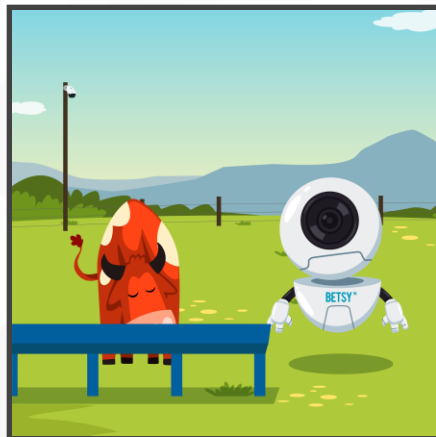
Lameness Detection



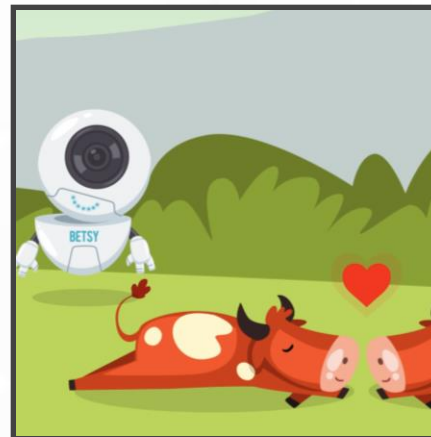
Suckling/Colostrum



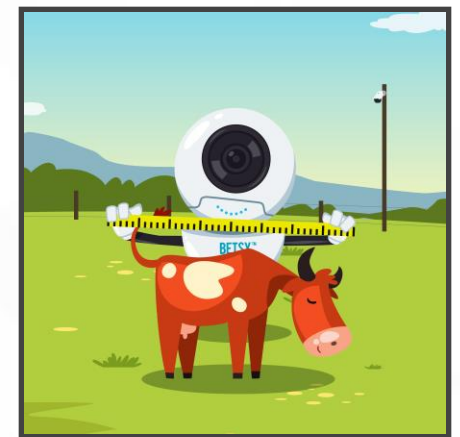
Shipping Manifests



Feed Efficiency



Estrus and Mating



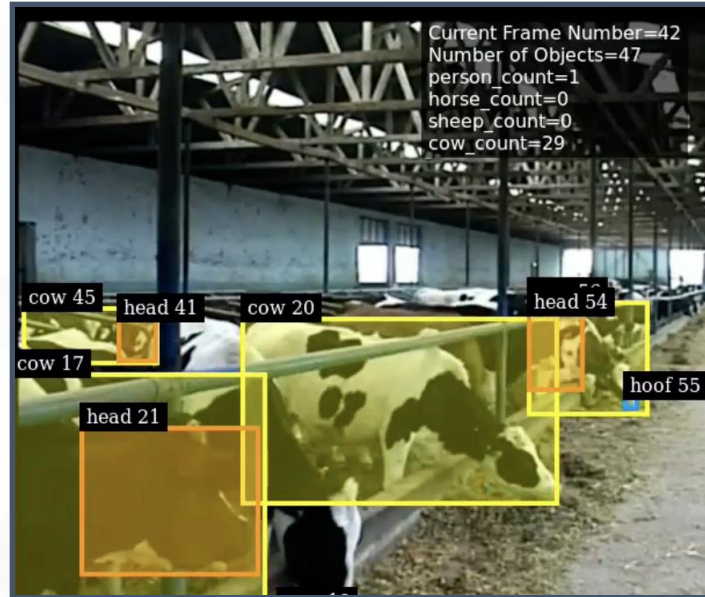
Growth Tracking

Beef & Dairy Cattle

CALVING CAM



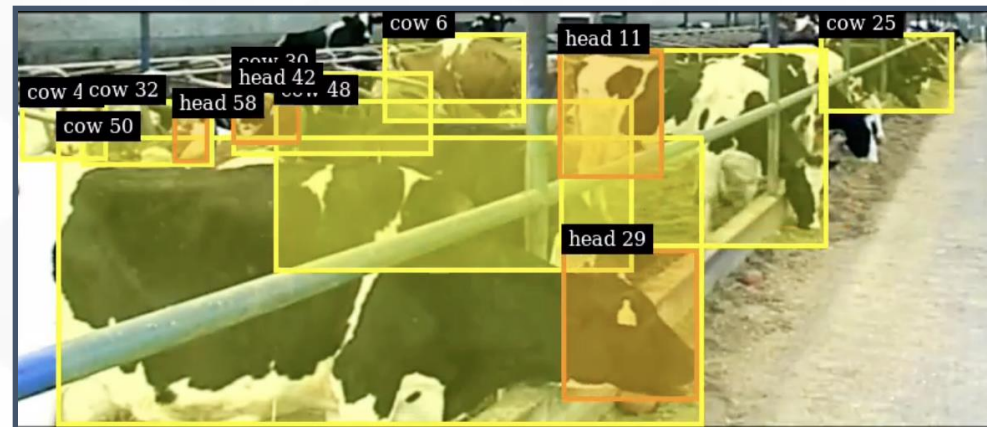
USE CASES



SHIPPING & TRACKING

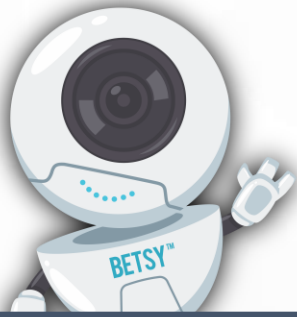


FEED TRACKING



BREEDING CAM





Calving

60-90 DAYS



PRE-CALVING



Determining when an animal will calve.

BETSY tracks contractions over time.



BIRTH



The first six hours are critical with bonding and colostrum.

BETSY measures birth duration and direction.



CALF



Calves can easily suffer from dehydration, starving and freezing.

BETSY is most helpful with heifers.

Feed Lots

USE CASES

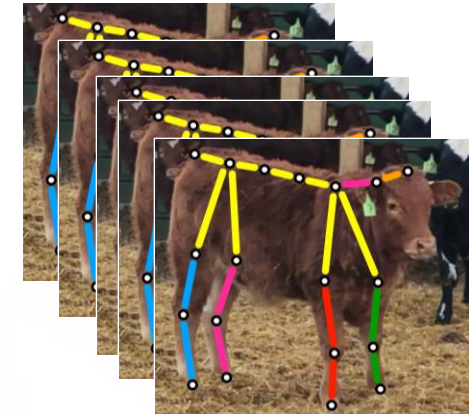
BRD DETECTION



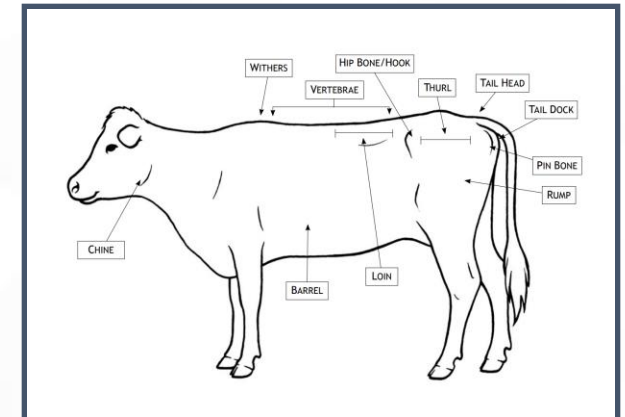
GROWTH TRACKING



LAMENESS

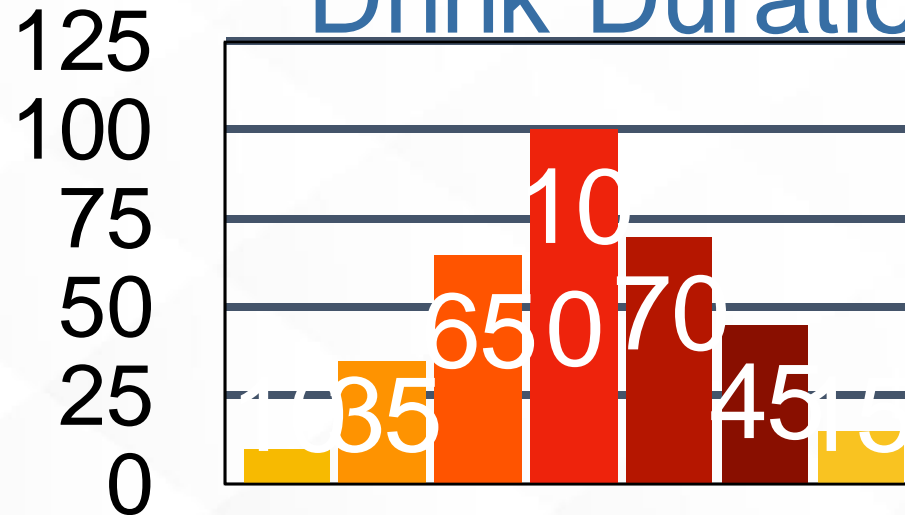


BCS SCORE / GRADING

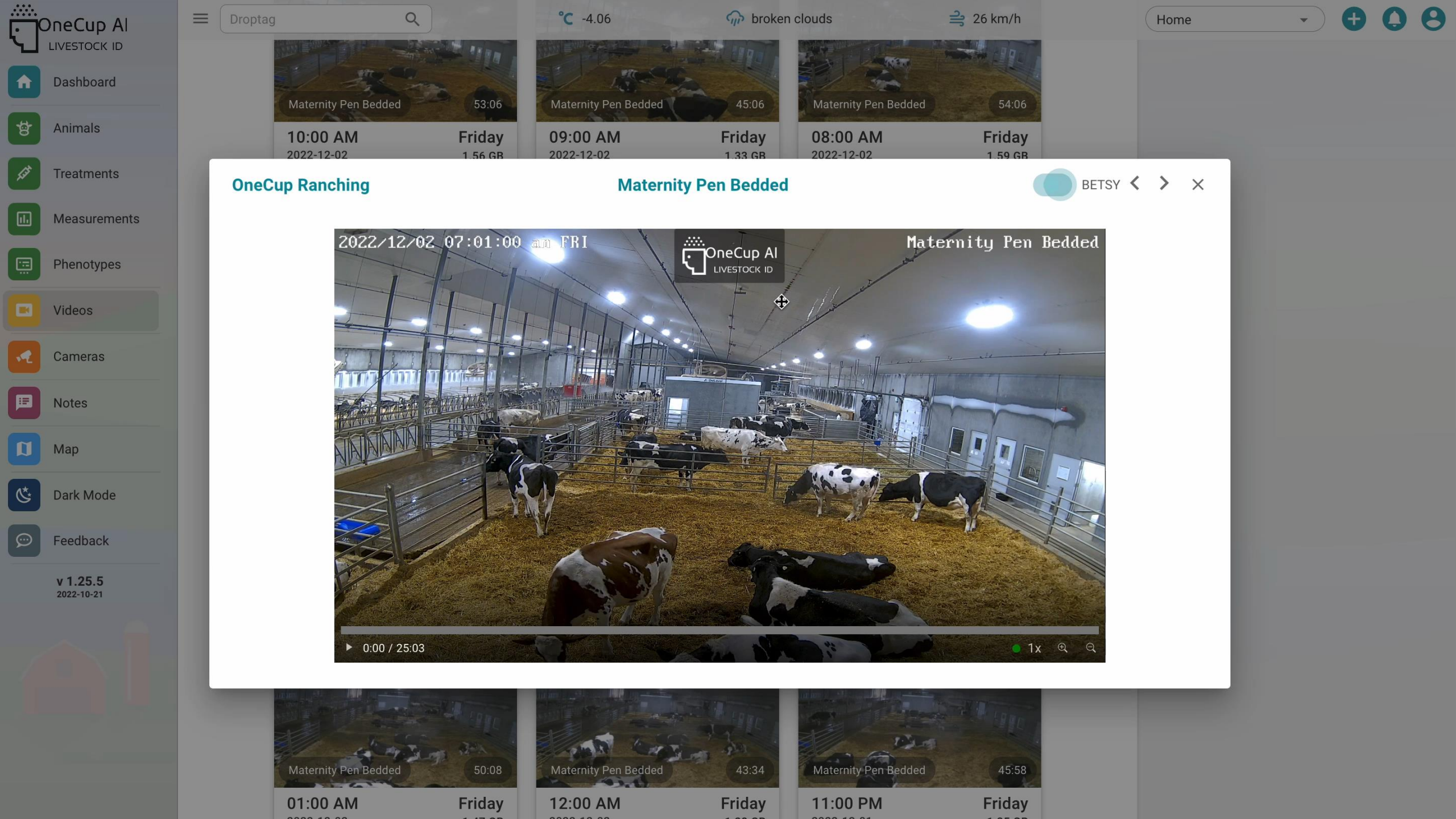


Source: Gov of Alberta, BCS Guide

Drink Duratio



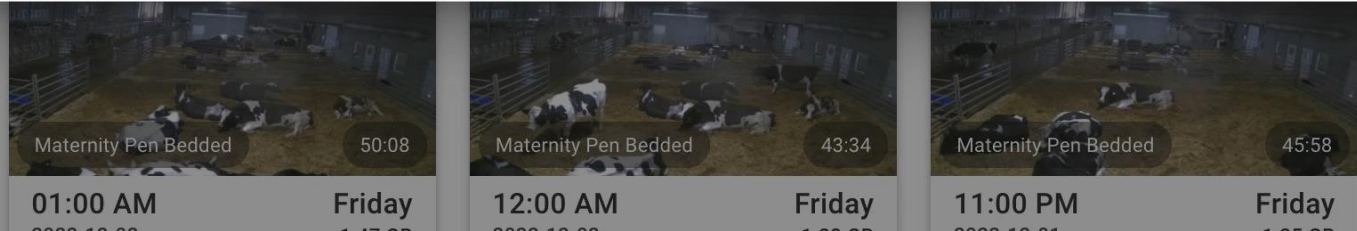
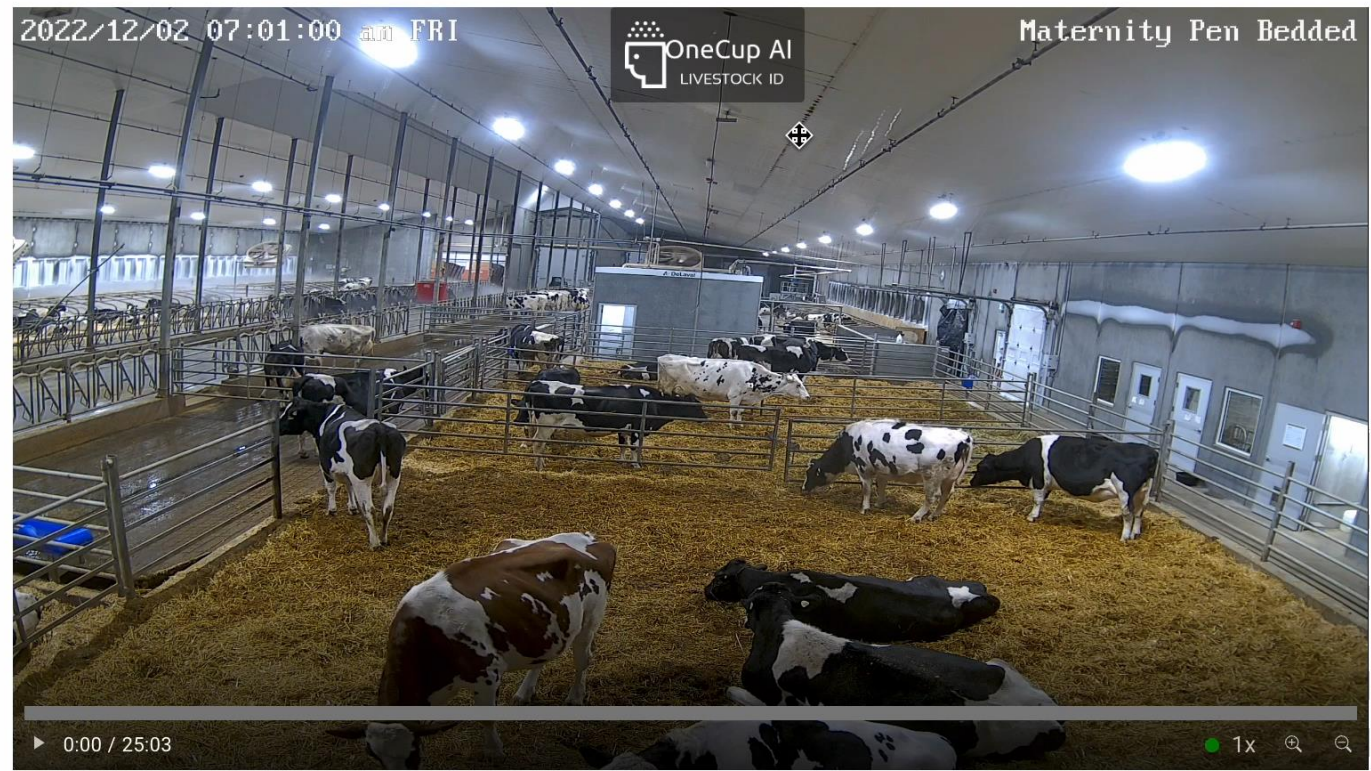
Animal
Distribution for
Pen size of 330



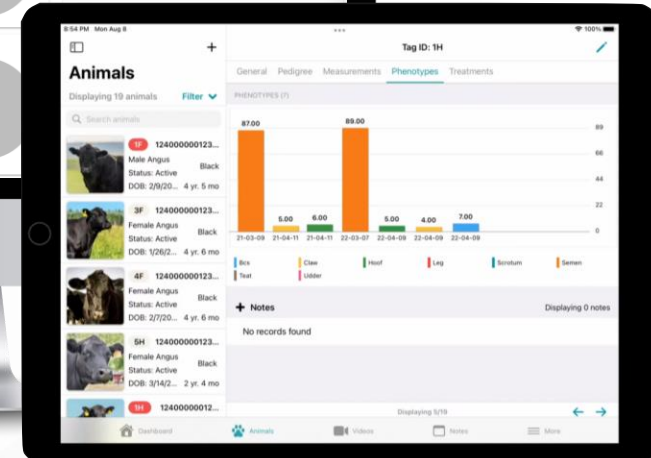
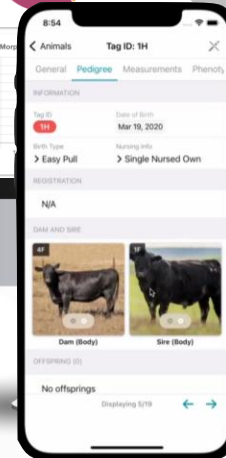
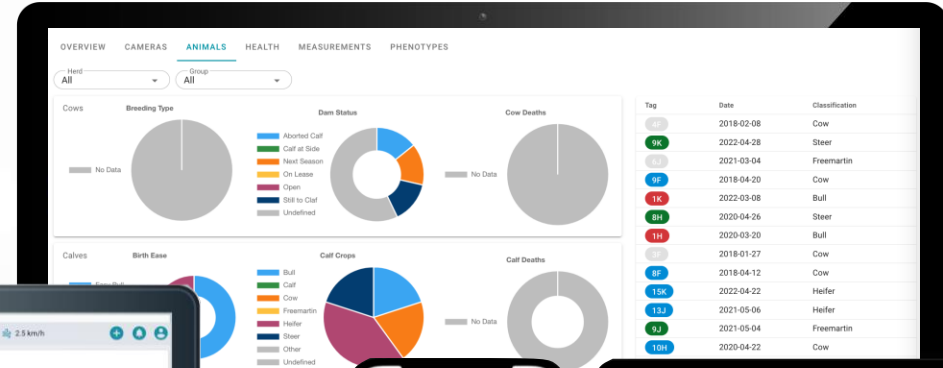
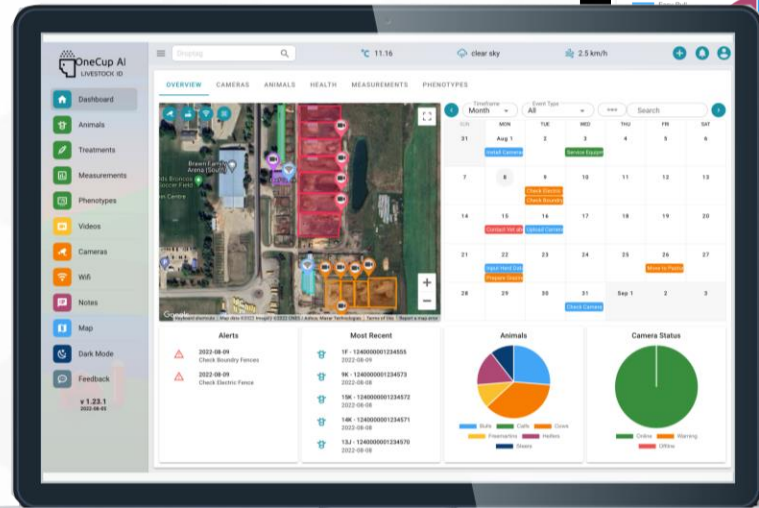
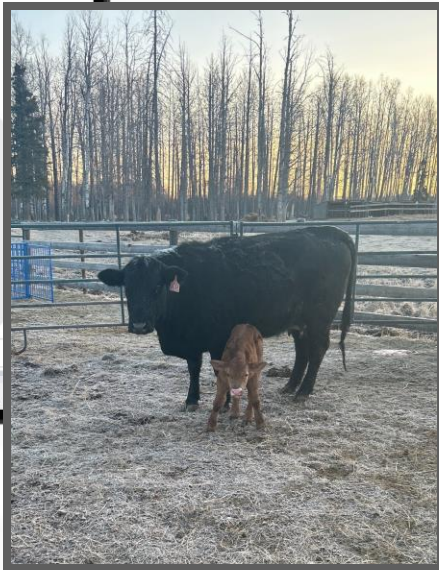
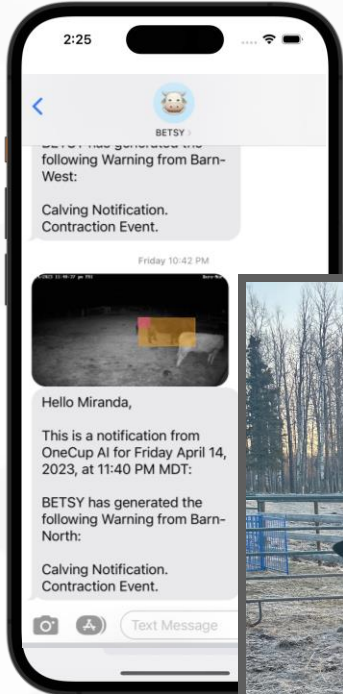
OneCup Ranching

Maternity Pen Bedded

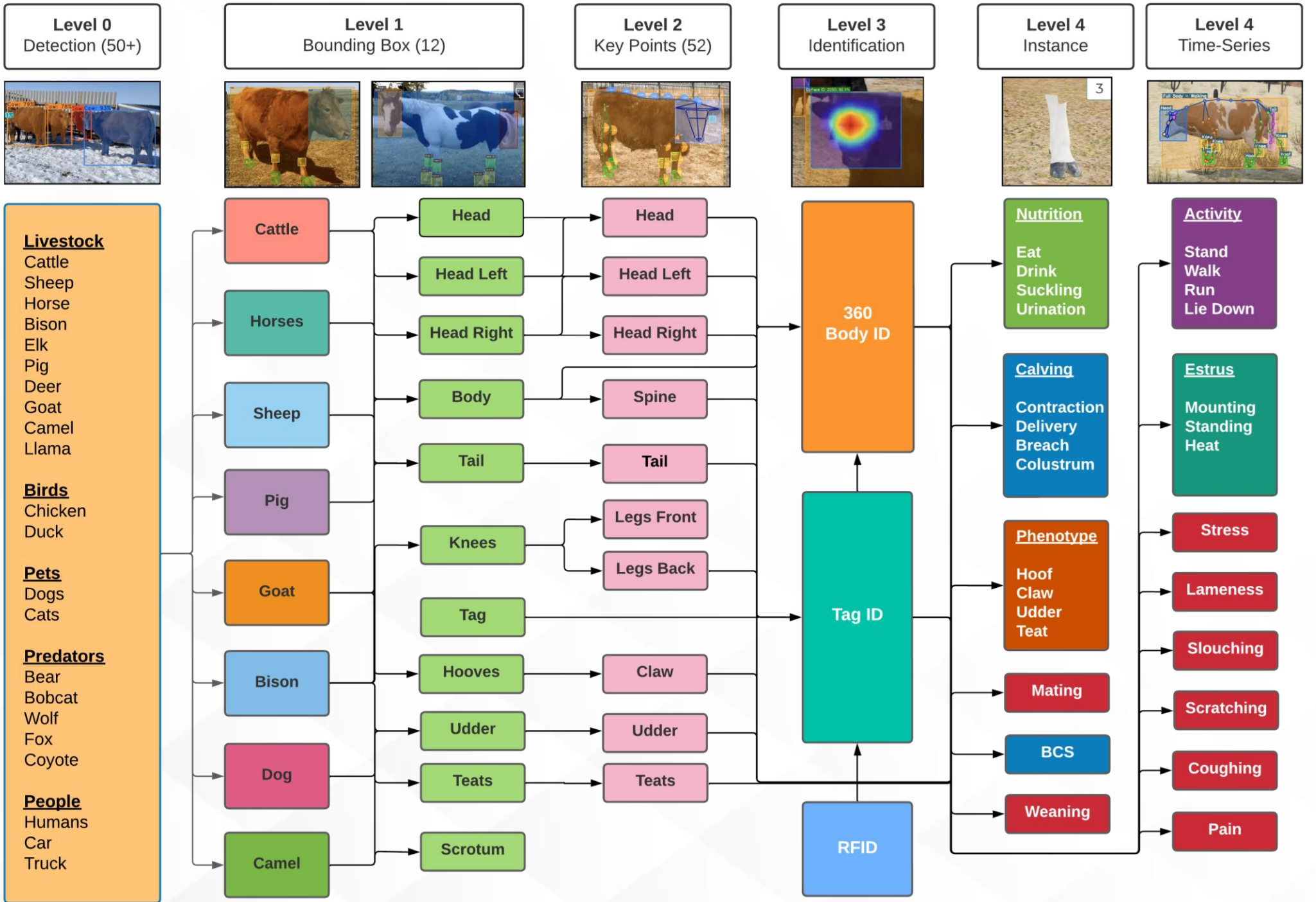
BETSY < > X



User Interface



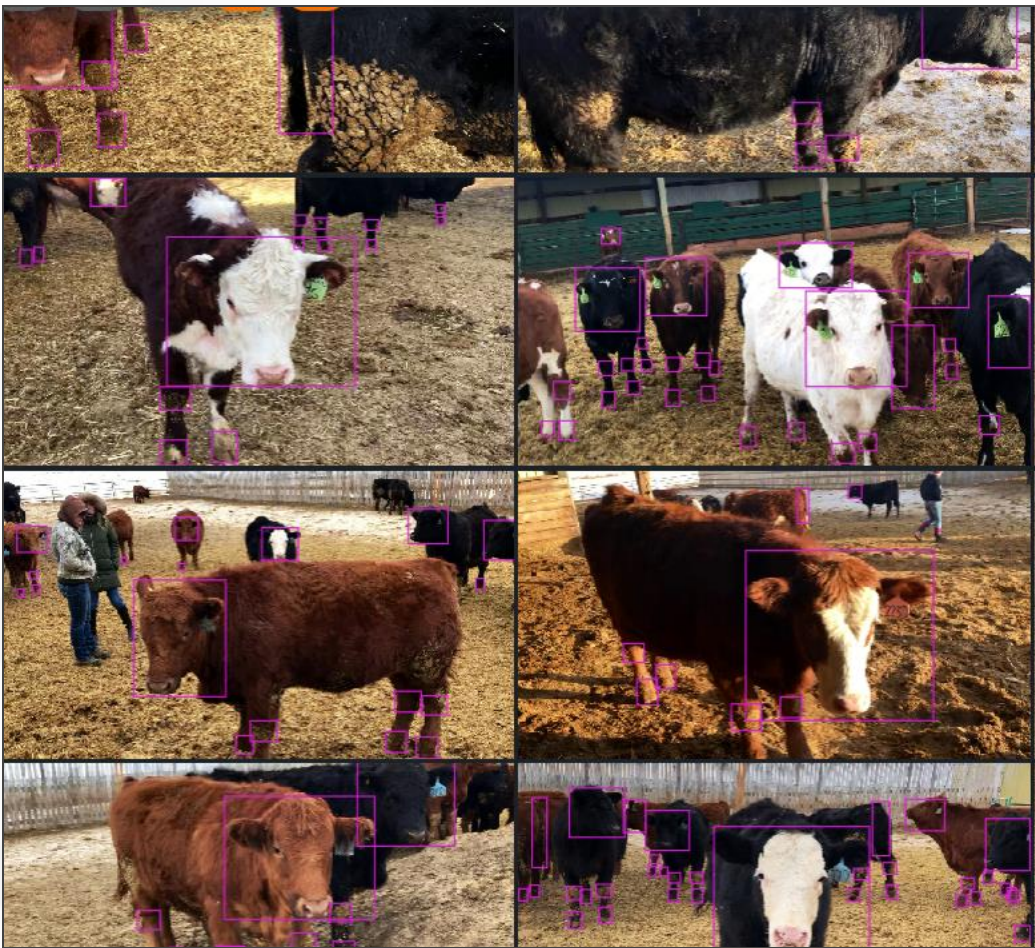
Patent Pending



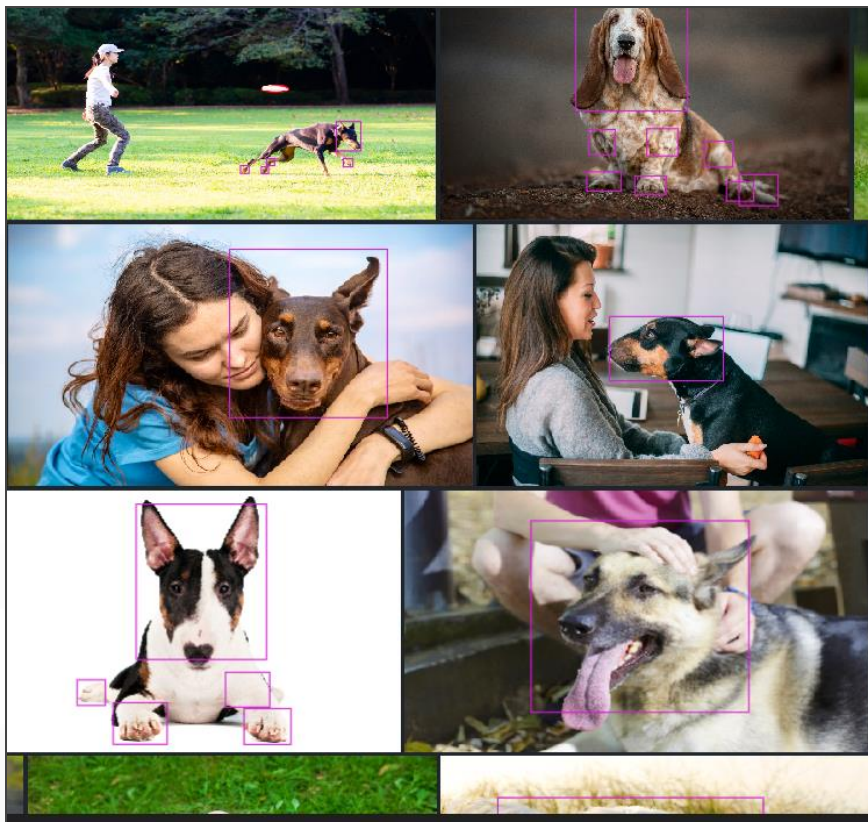
OneCup AI

Level 1

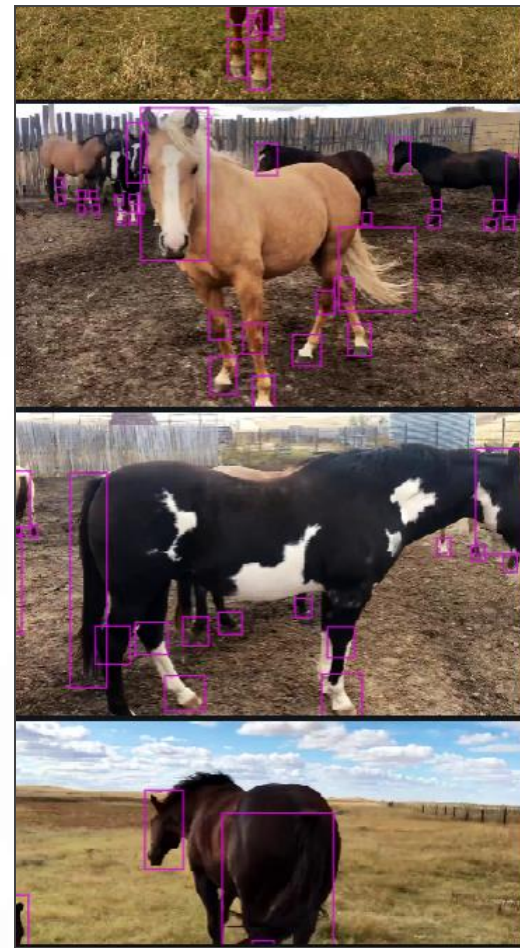
Bounding Box Detector



Cattle



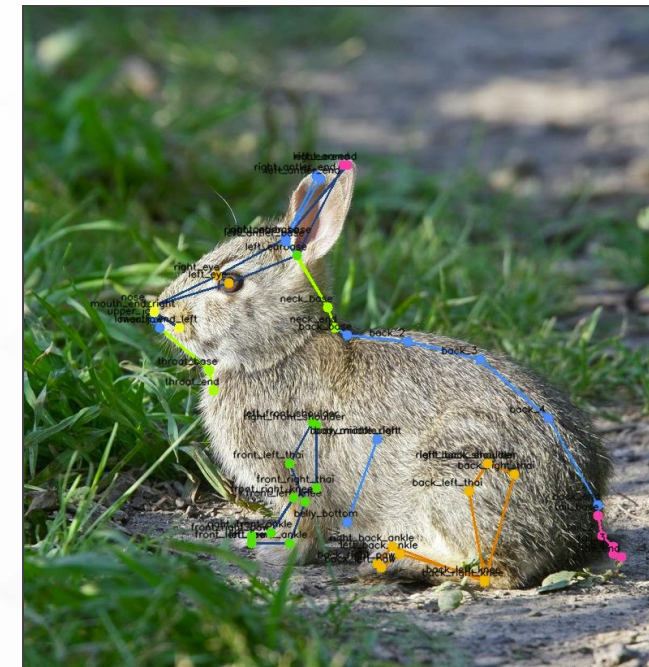
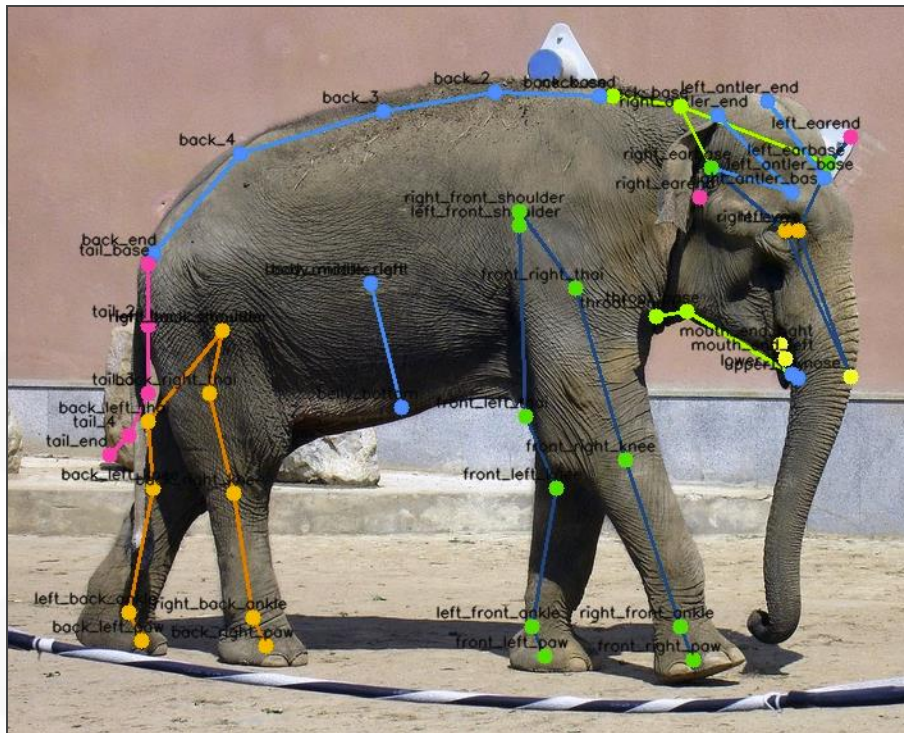
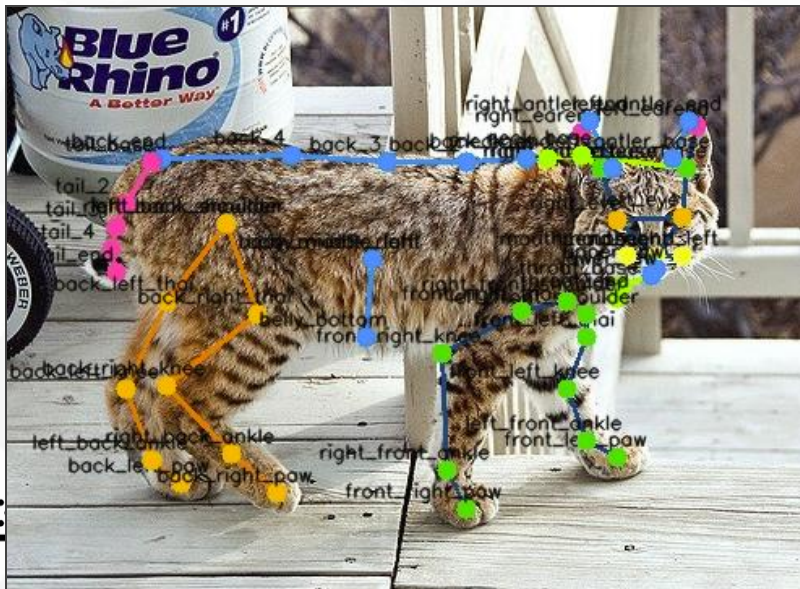
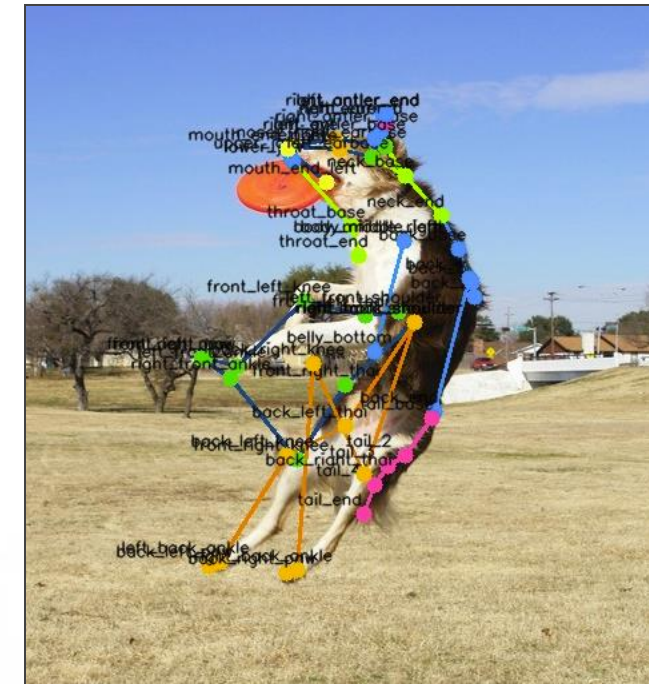
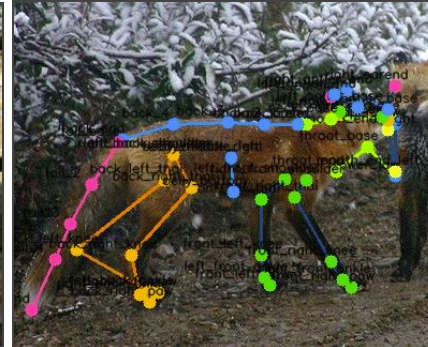
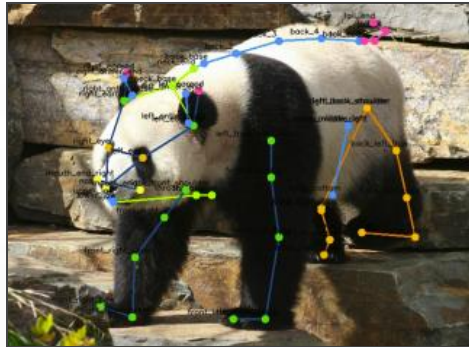
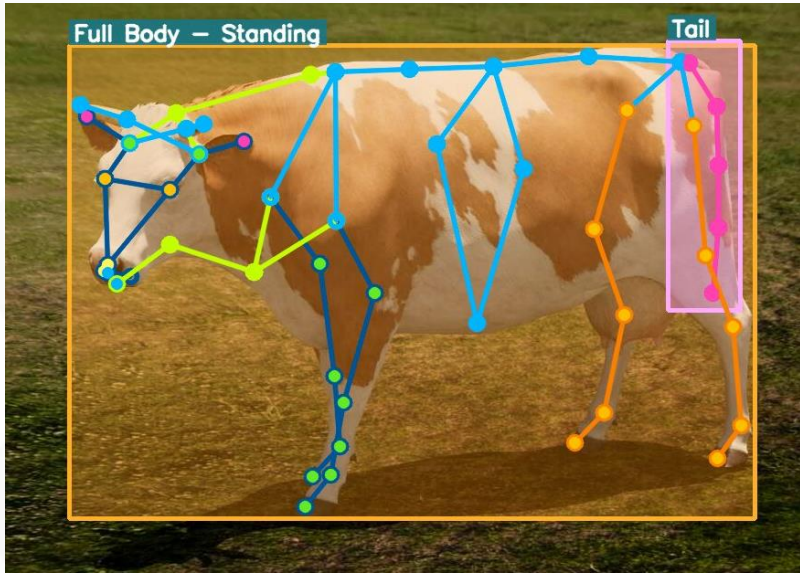
Dogs



Horses

Level 2

52 Key Point Model

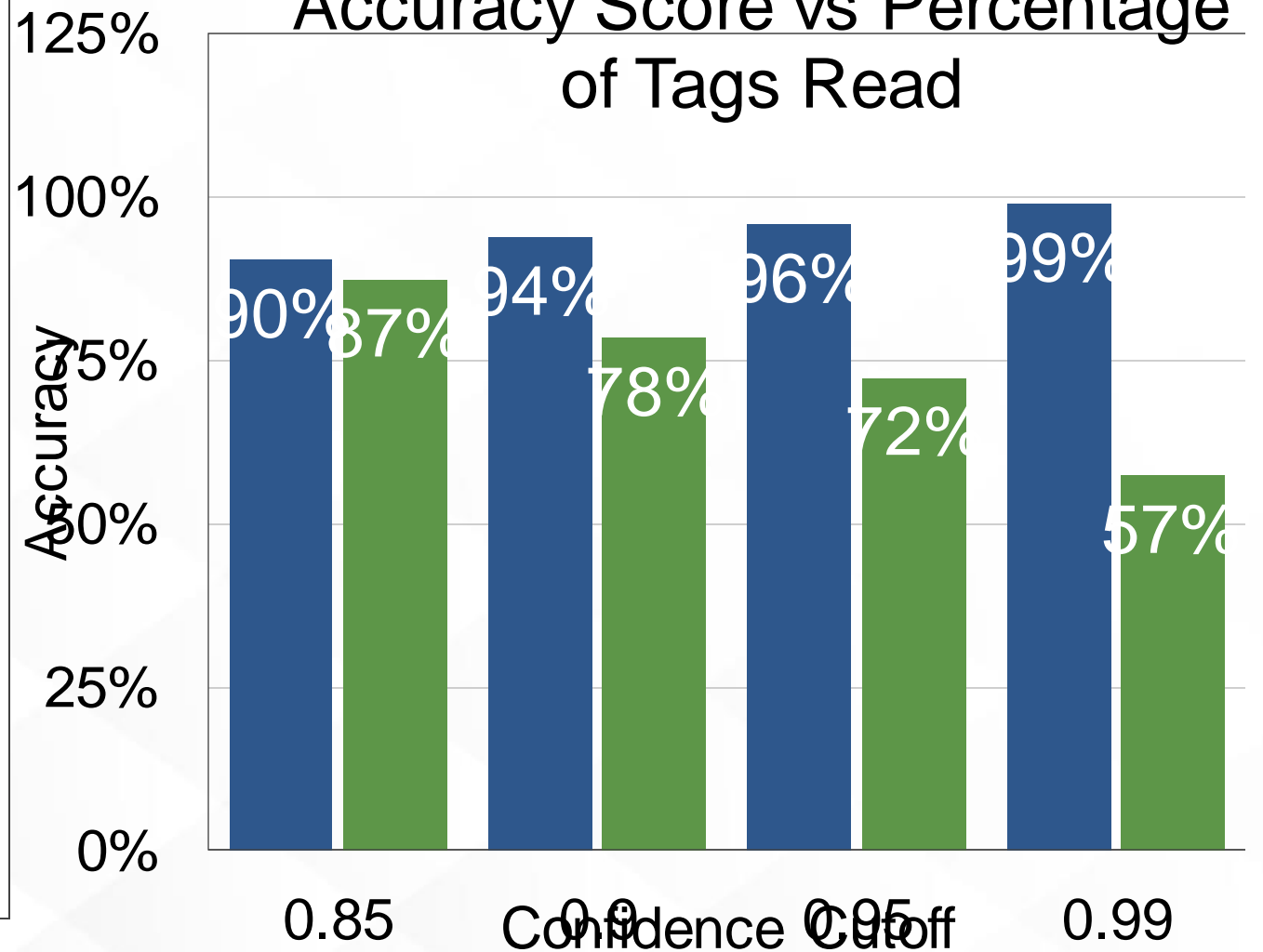


Level 3

OCR ID



Accuracy Score vs Percentage of Tags Read



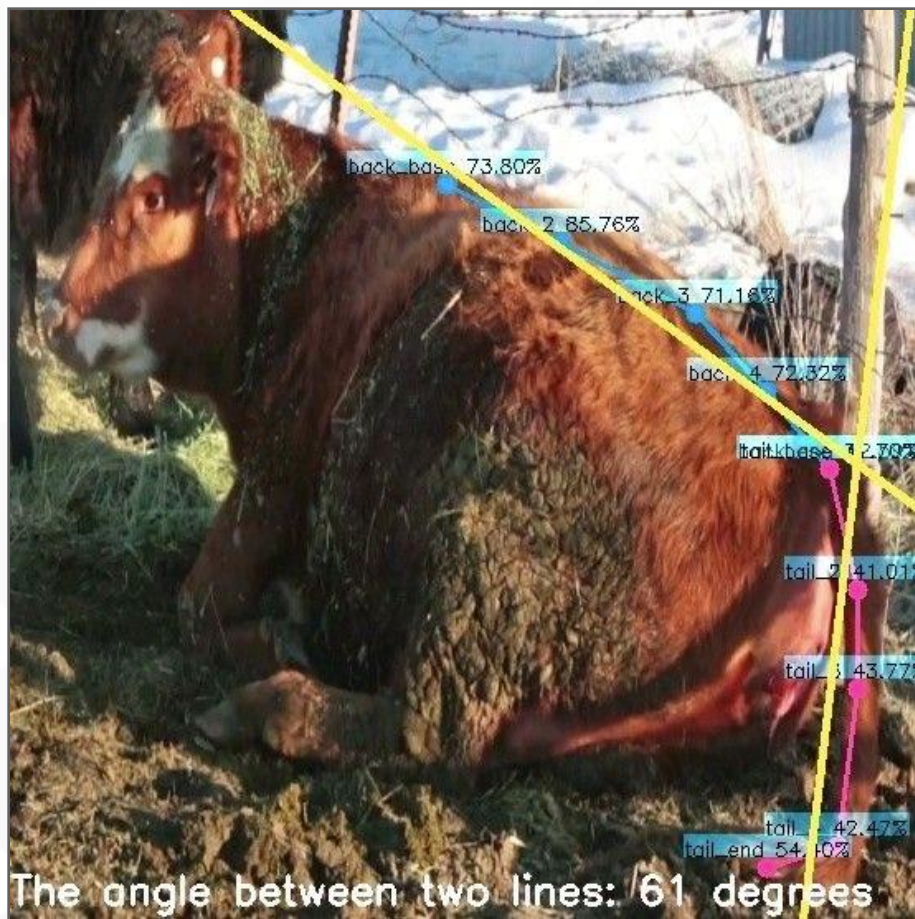
Level 3

360 Body ID

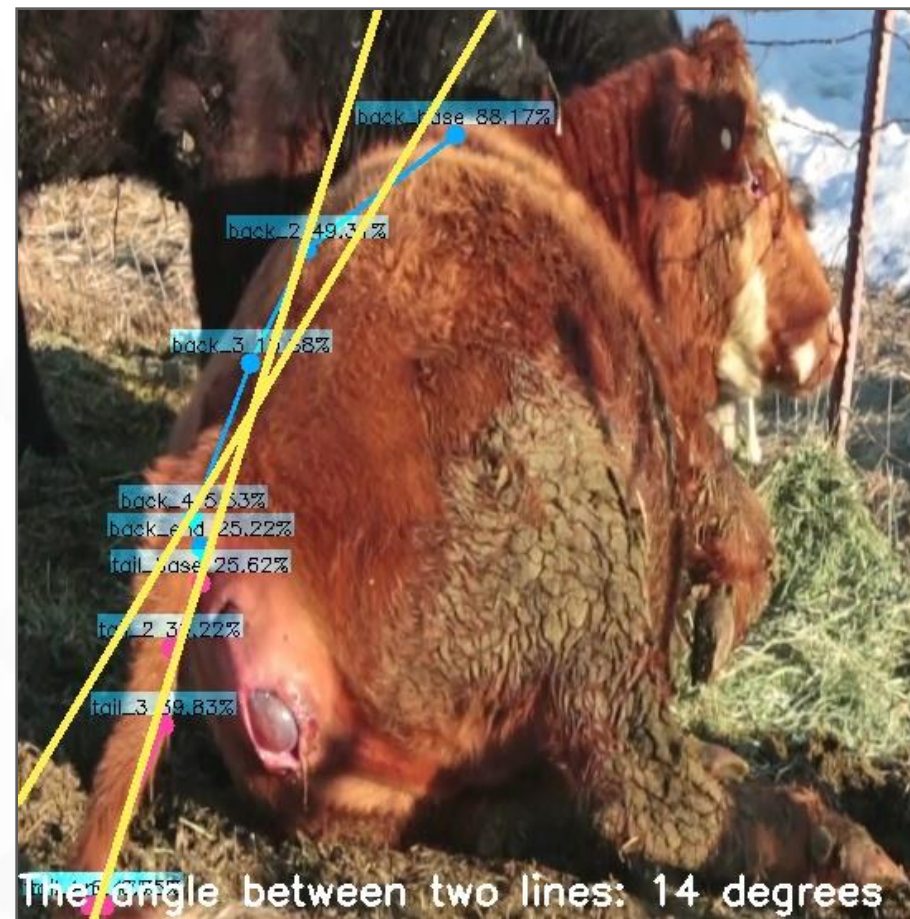


Level 4

Contraction Detection



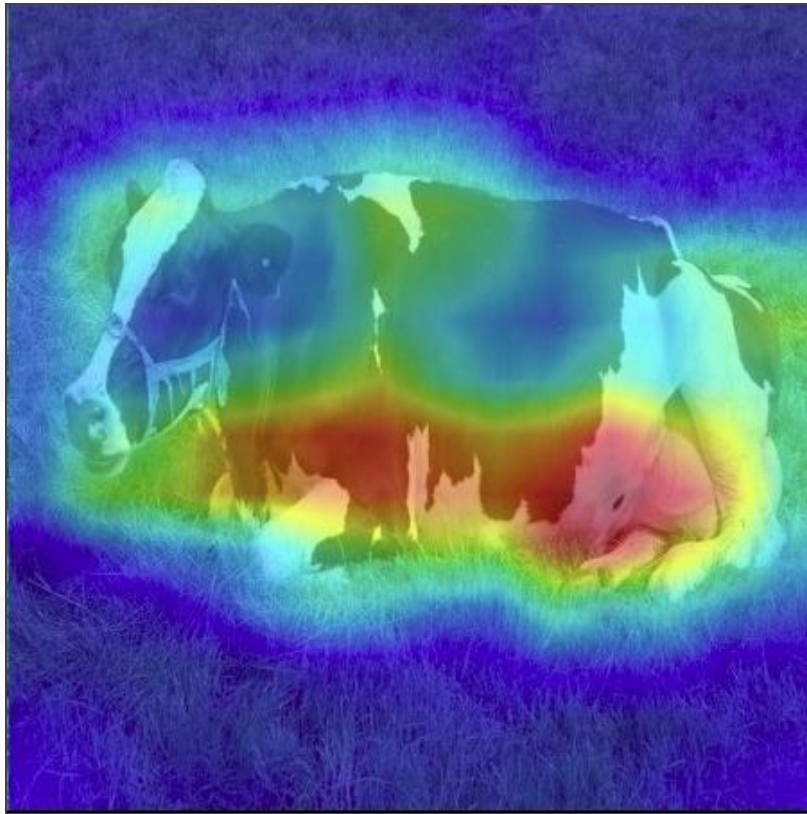
No Contraction



Contraction

Level 4

Activity Classifier



Lying Down

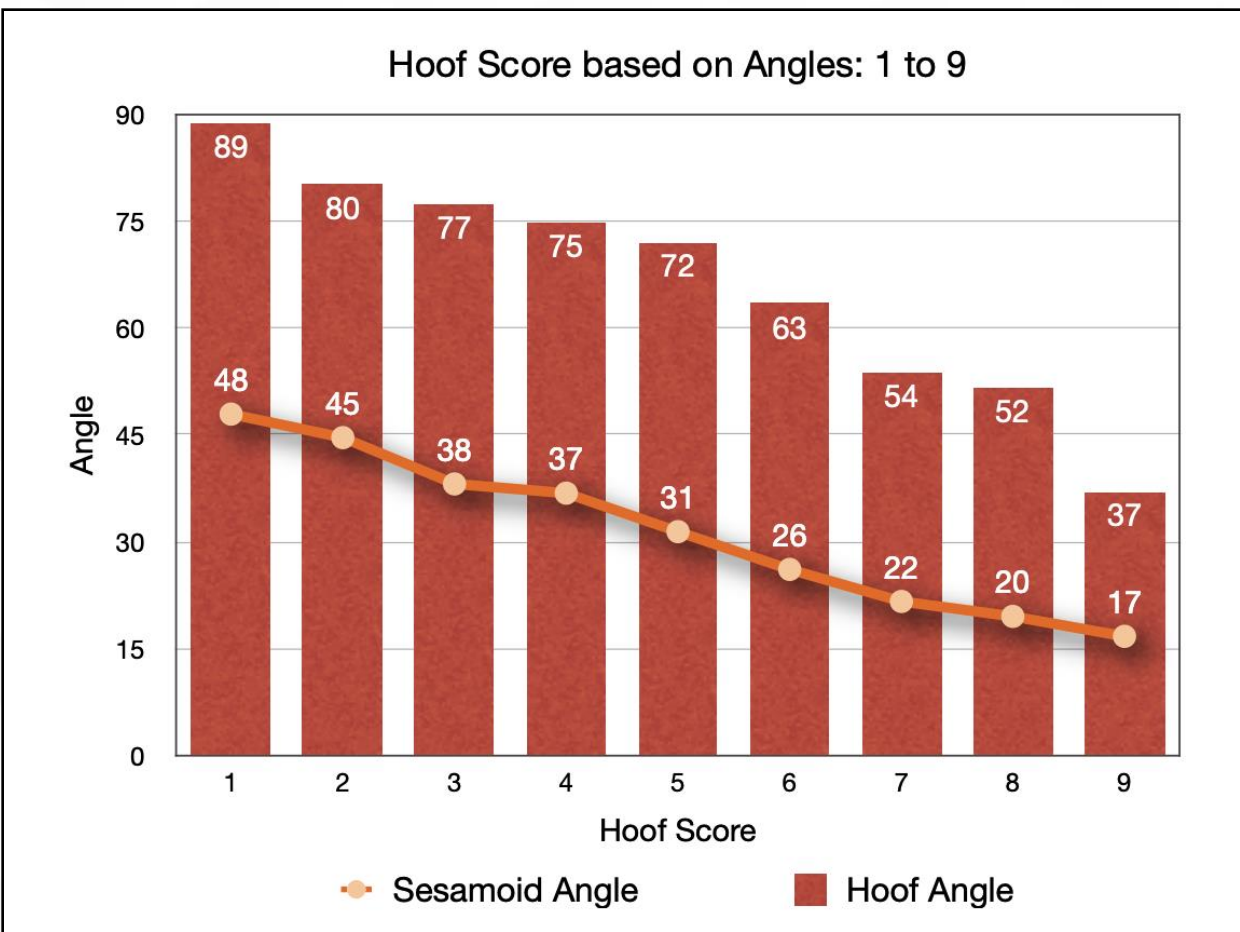


Walking



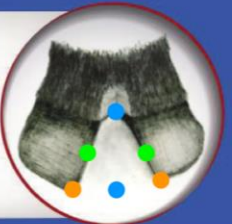
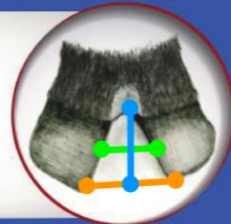
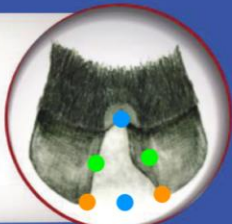
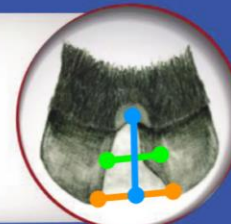
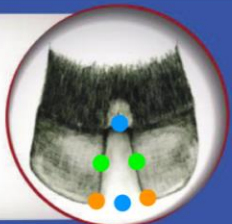
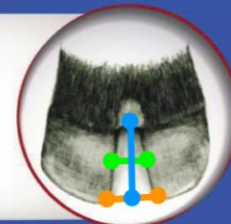
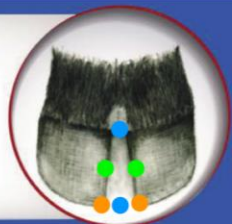
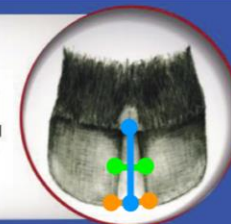
Drinking

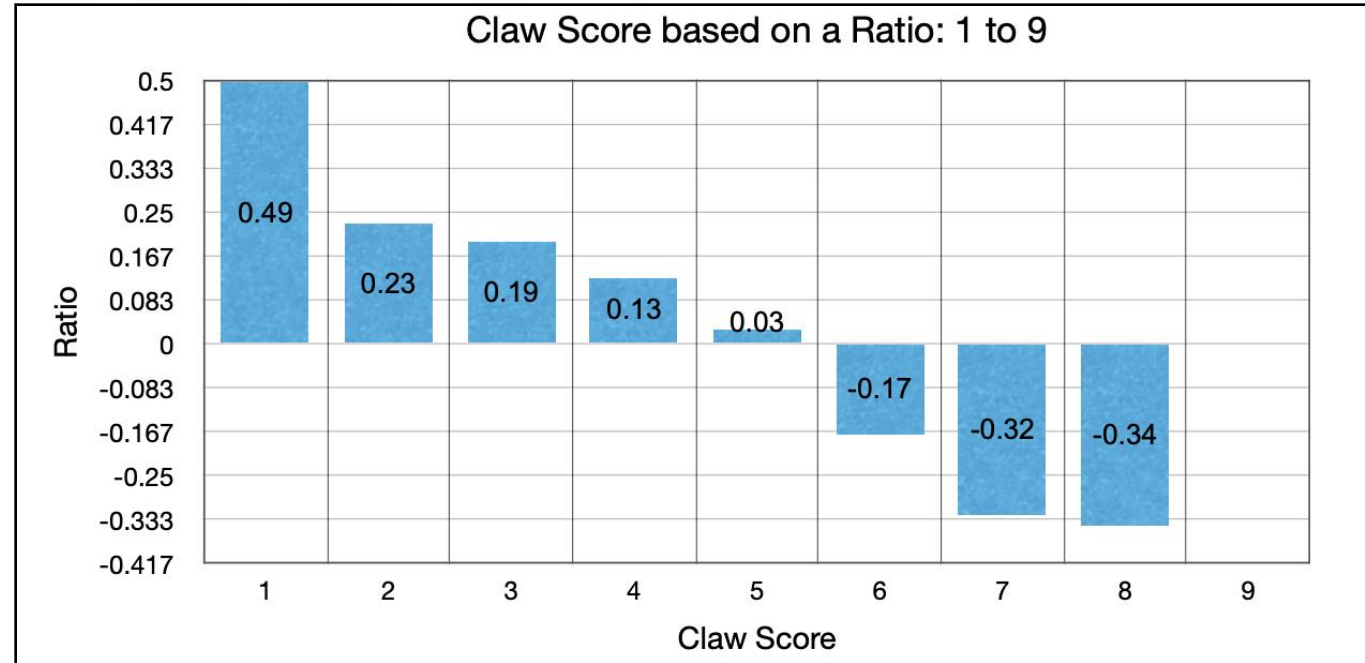
Level 4 - Phenotypes - Hooves

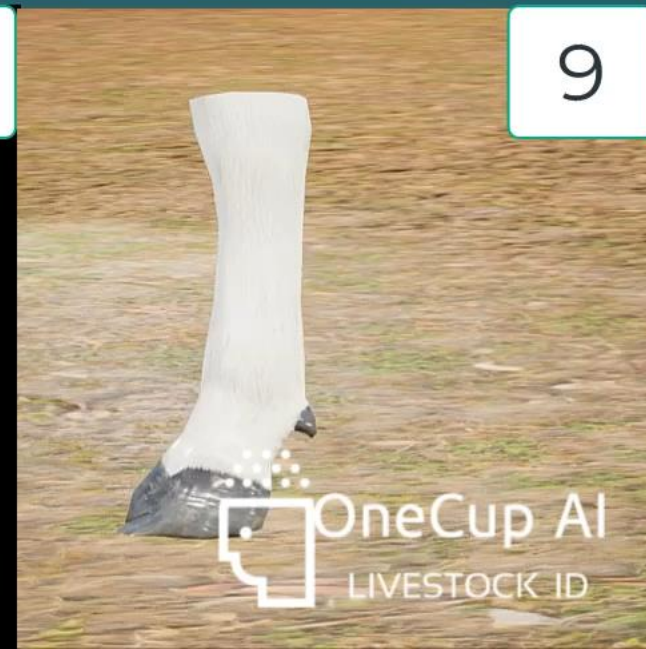
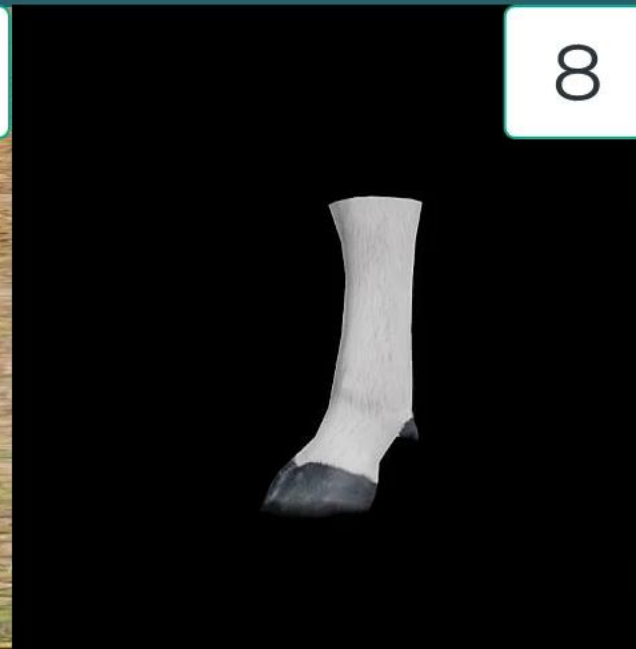
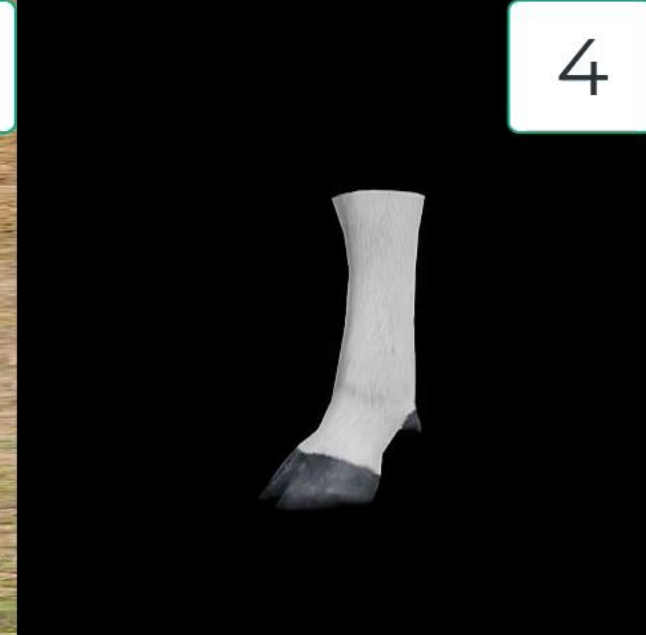


Score	BETSY's Vision	Computed Foot Angles
Score: 1		
Score: 2		
Score: 3		
Score: 4		

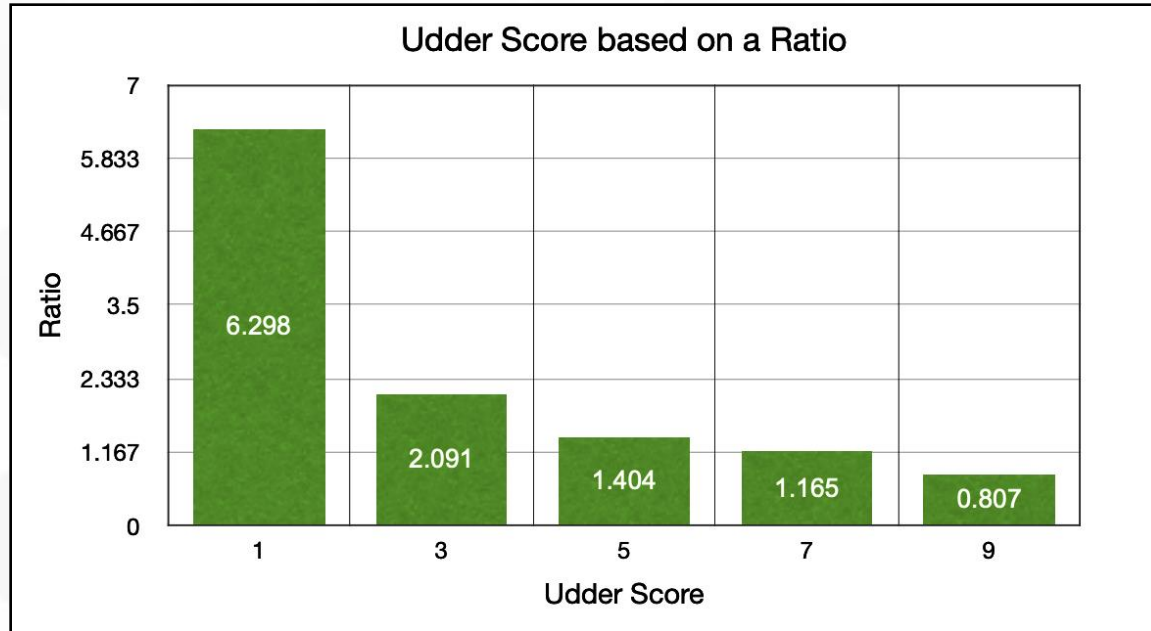
Level 4 - Phenotypes - Claws

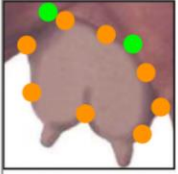
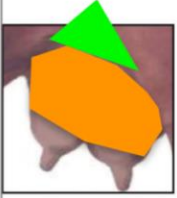
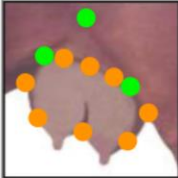

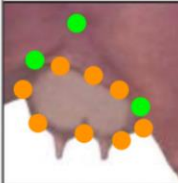

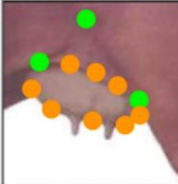
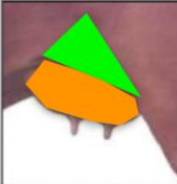
Score	BETSY's Vision	Computed Claw Ratios
Score: 1	1 	1 
Score: 2	2 	2 
Score: 3	3 	3 
Score: 4	4 	4 





Level 4 - Phenotypes - Udders



Score	BETSY's Vision	Computed Udder Ratios
Score: 1	 <p>Very Pendulous/ Broken Floor</p>	 <p>Very Pendulous/ Broken Floor</p>
Score: 3	 <p>Pendulous</p>	 <p>Pendulous</p>
Score: 5	 <p>Intermediate/ Moderate</p>	 <p>Intermediate/ Moderate</p>
Score: 7	 <p>Tight</p>	 <p>Tight</p>





Claw Score: 5



Udder Score: 5



Hoof Score: 5

495

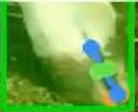


Ratio: 0.056
Claw Score: 5



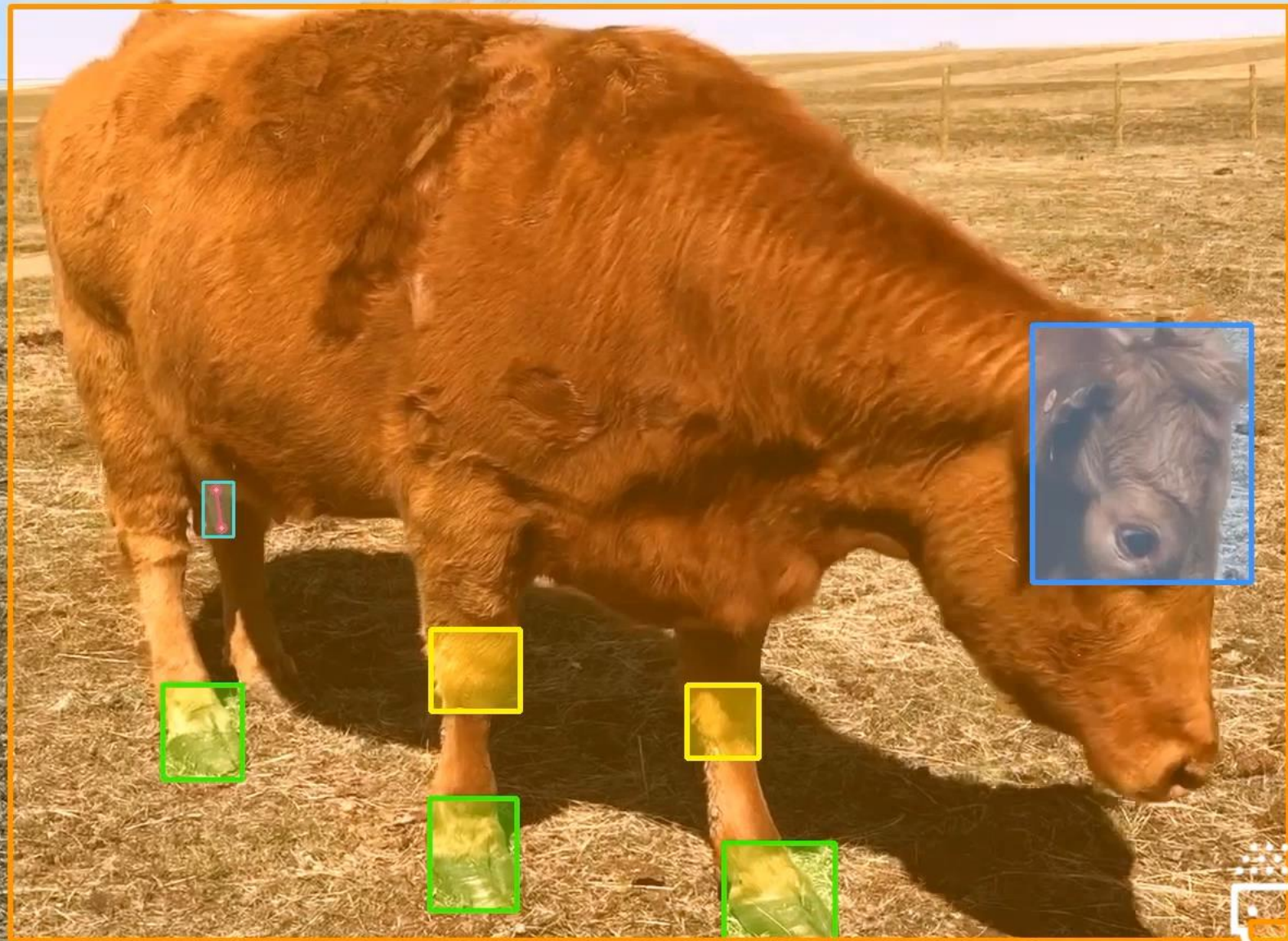
H: 41.07
W1: 7.87
W2: 10.27

Ratio: 0.000
Claw Score: 6

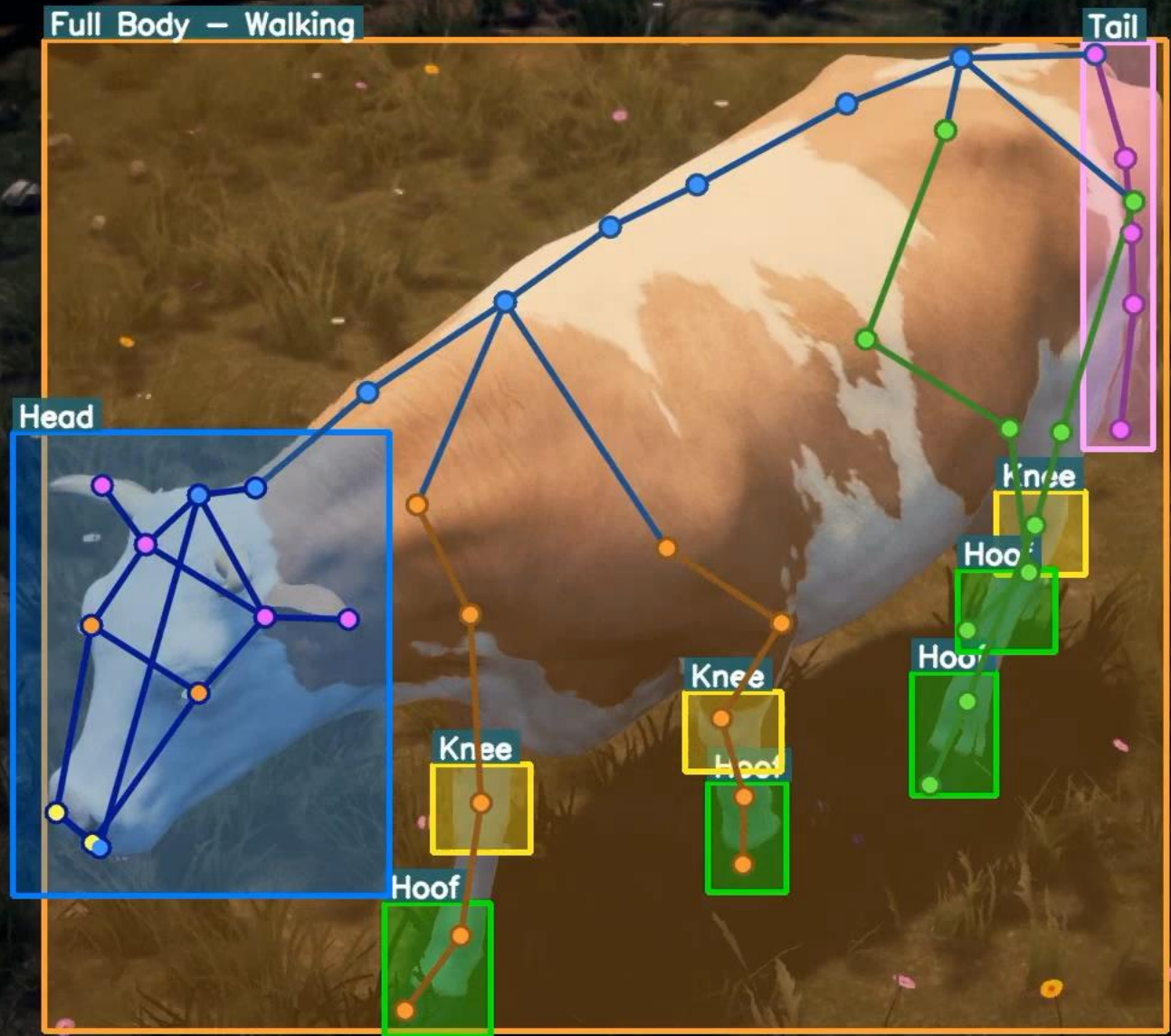


H: 40.15
W1: 7.87
W2: 7.87





Map : Cornfield
Tag : FocusPoint_1





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