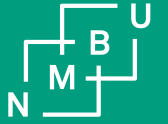


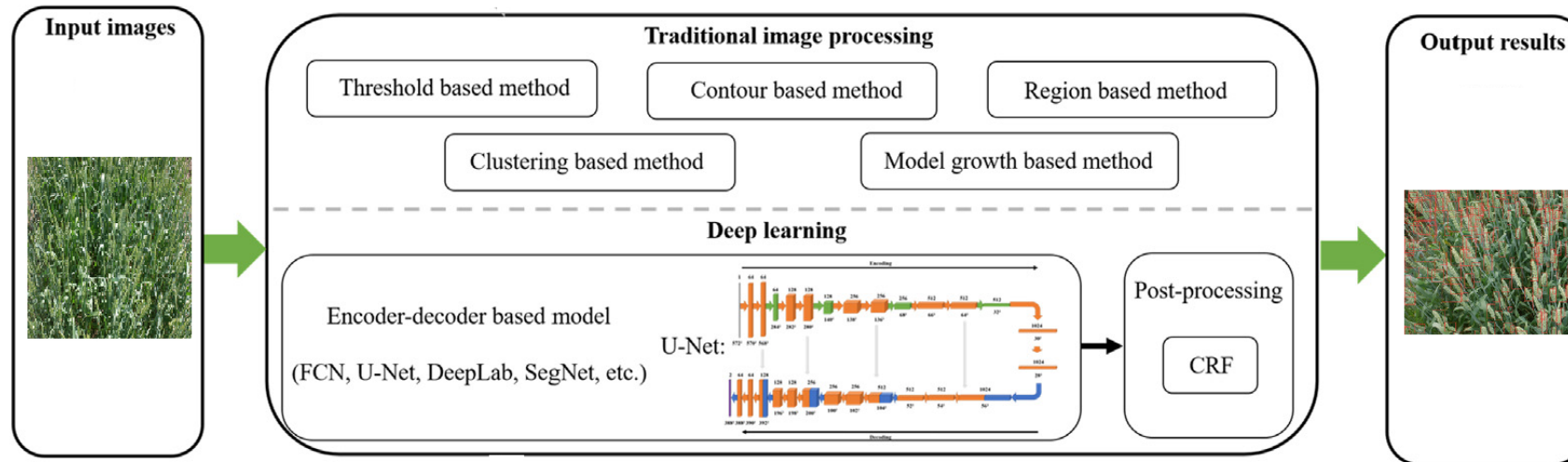
Wheat head counting and FHB detection



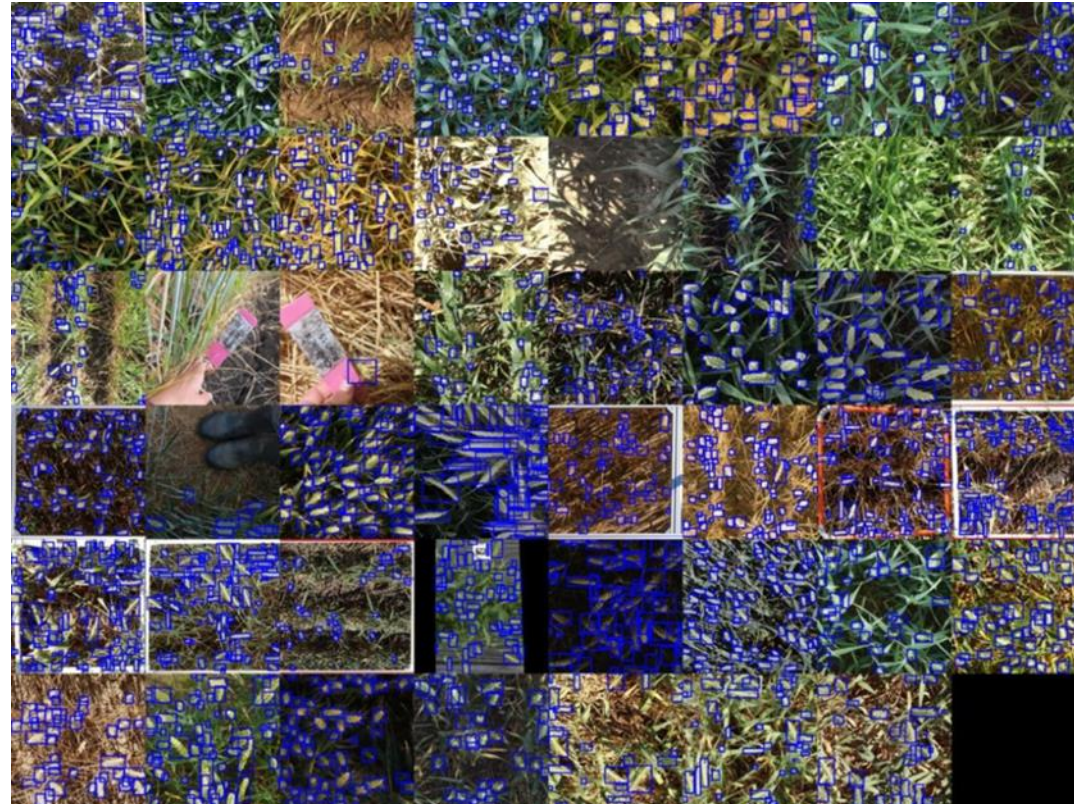
Sahameh Shafiee
Department of plant science
Norwegian University of Life Sciences (NMBU)



What's the challenge ?



Global Wheat Head Dataset (GWHD)



Wheat head detection using close-up images



Image size:1024x1024
Cropped from the main image

- YOLO5 deep learning model

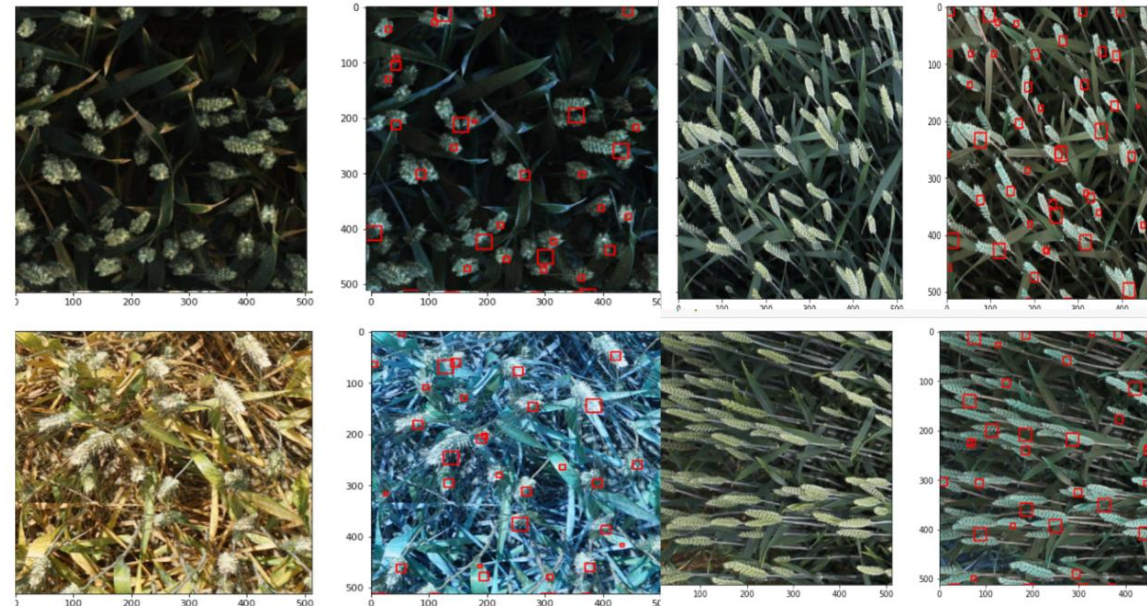


Detected heads using YOLO5
Accuracy: up to 95%

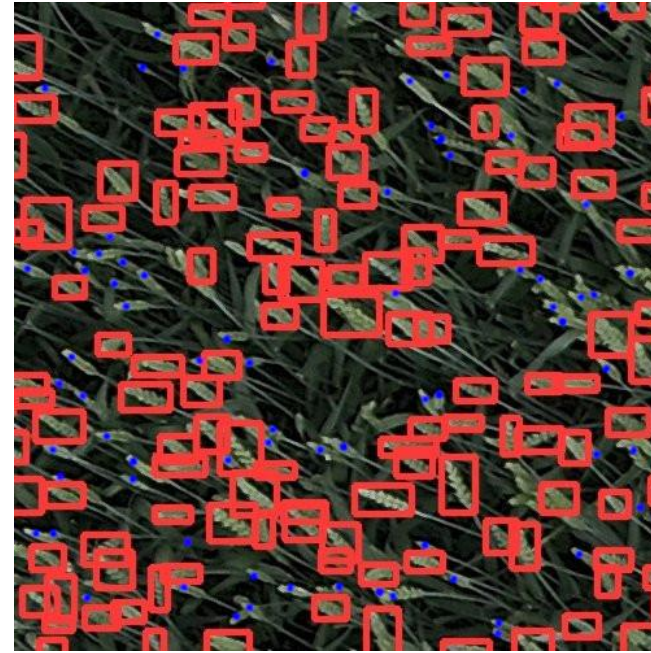
Can we make it on-the-og?

Spring wheat head counting (YT)

Counting barley heads



How about using drone images?



Best Accuracy = 69%

Can we add another layer? FHB detection?



Initial approach (Drone images)



FHB Data collection

Alternate approach (Robot images)

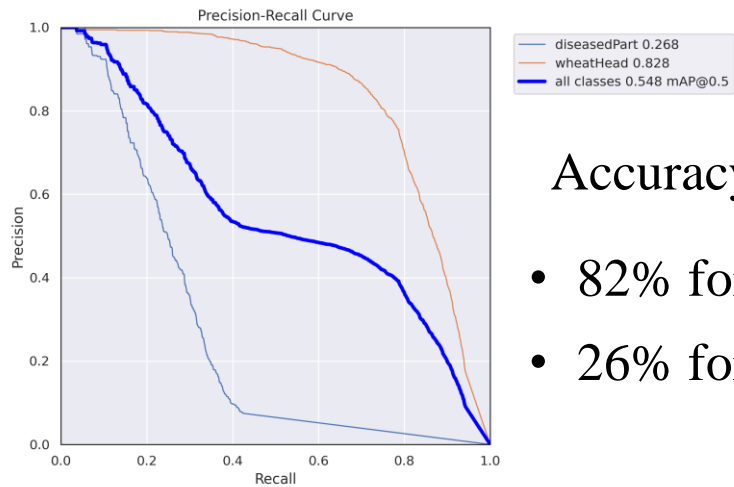
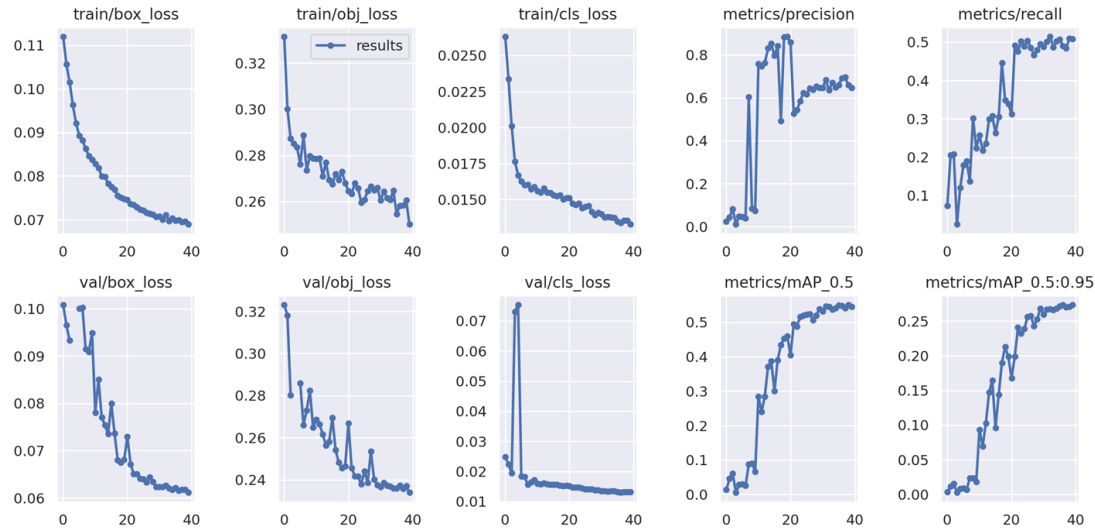
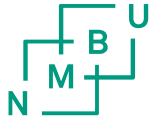


Data annotation & preparation

- Coco annotator to annotate the images
- Total of 700 images in the dataset
(25706 instance of wheat heads,
10866 instance of diseased parts)
- Splitting the dataset to train, validate and test (70%, 20%, 10%)



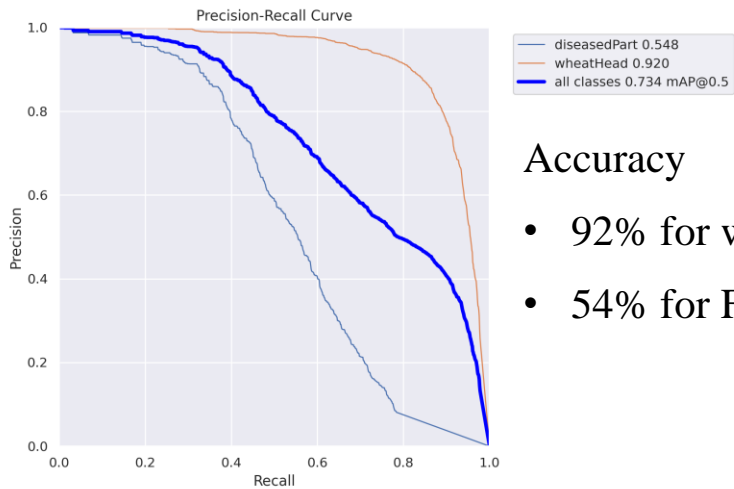
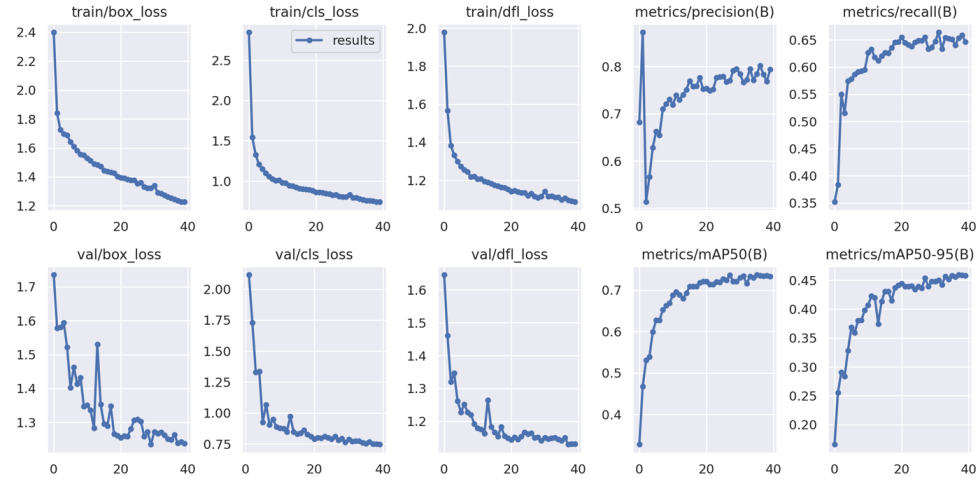
Yolov5 performance in training & validation



Accuracy

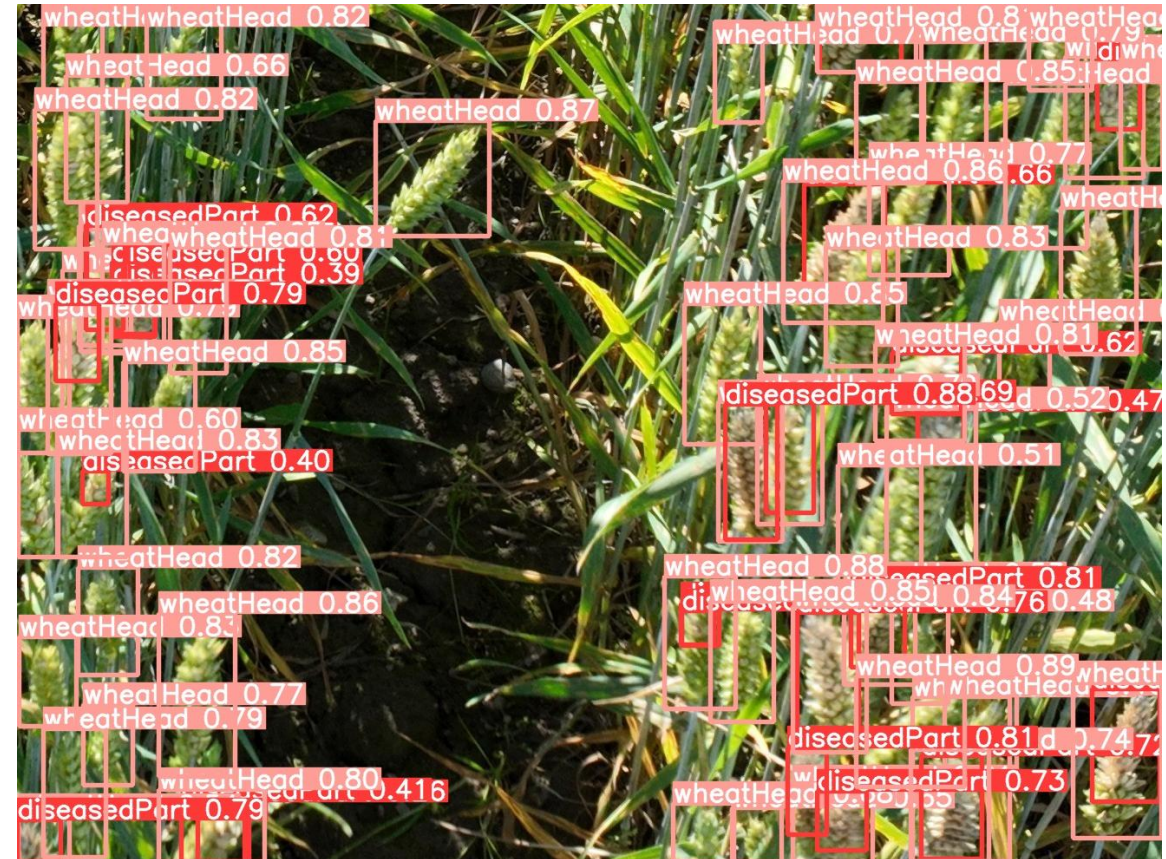
- 82% for wheat heads detection
- 26% for FHB detection

Yolov8 performance in training & validation



Accuracy

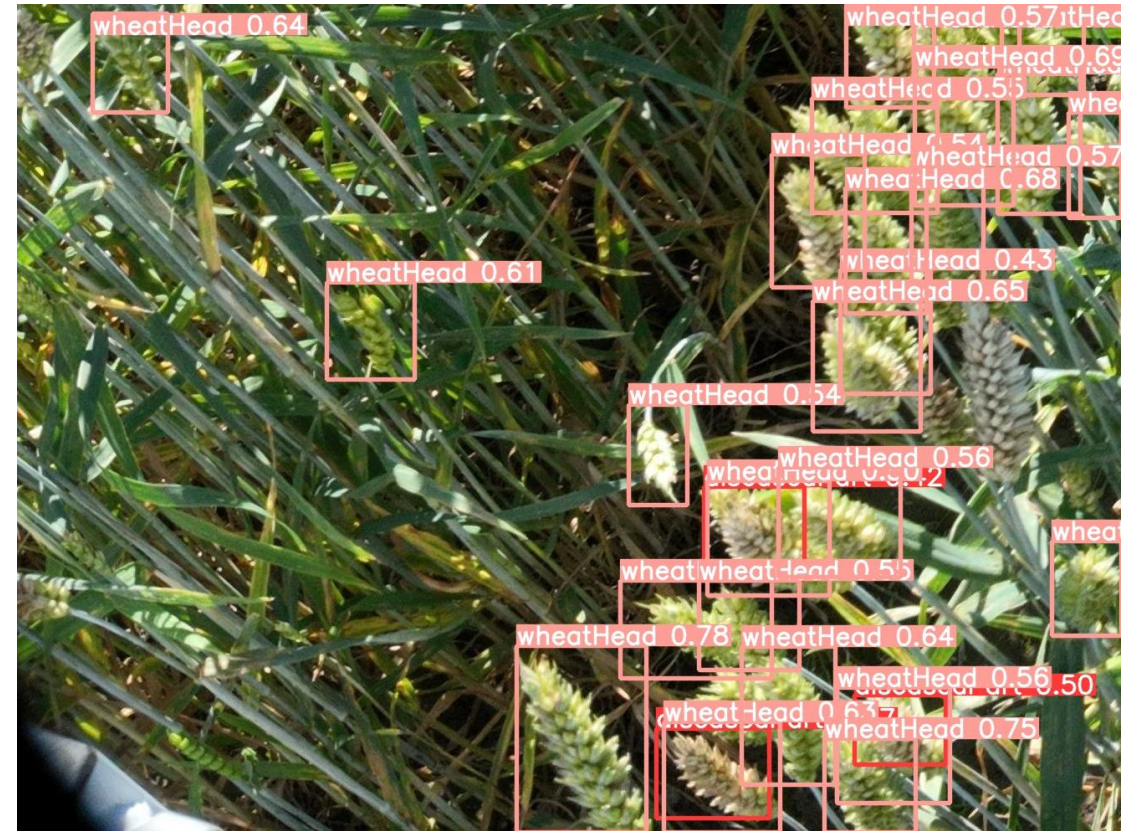
- 92% for wheat heads detection
- 54% for FHB detection



Testing both models' performance on the same image



Yolov8



Yolov5