

# Step 1: Flying the drone

## The Project

Utilizing AI to identify and locate trash in diverse environments to help better the environment.

## Project Goals

- Improving current Trash Detection model.
- Successfully implementing this model in MRR.
- Finding new ideas that combine AI and drone technology.



# Step 2: Trash detection

## Approach

- Gathering insights on data
- Annotating new images
- Improving current model
- Experimenting new models
- Connecting model with API

## Datasets

- UAVVaste 772 x
- MRR drones 169 x

## Methods

- Annotations and labelling in CVAT
- Different Object Detection models

- Average Precision:
- Detectron2 88%
- DETR 87%
- YOLO 76%
- Previous group: 72%



Annotations and labelling in CVAT



# Step 3: Analysing results

## Results

- Best model: Detectron2
- Improved detection AP with +16%!
- Heatmap generation is working!

## Conclusion

- Models like Detectron2 and RT-DETR have overall higher performance scores than the previous YOLO-model.
- Detecting small or hidden trash remains challenging.
- Model is very accurate with AP-score of 88%, but selects non-trash objects sometimes.
- Our progress has been strong, with improved confidence compared to the previous model, showing AI's effectiveness in trash detection.

## Next Steps

- Finetuning model
- Model deployment
- API-setup
- New MRR idea
- Reporting results

