설명자료

YOLOv5 & DeepSORT Training

1. YOLO training

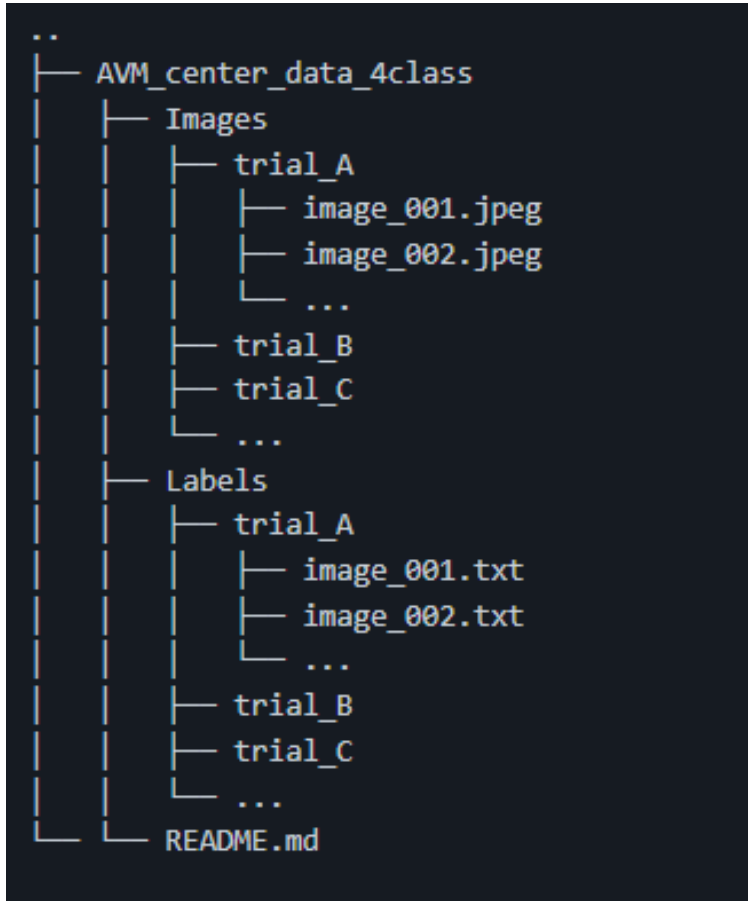
2. DeepSORT training

참고: https://github.com/JunhyeokRui/training

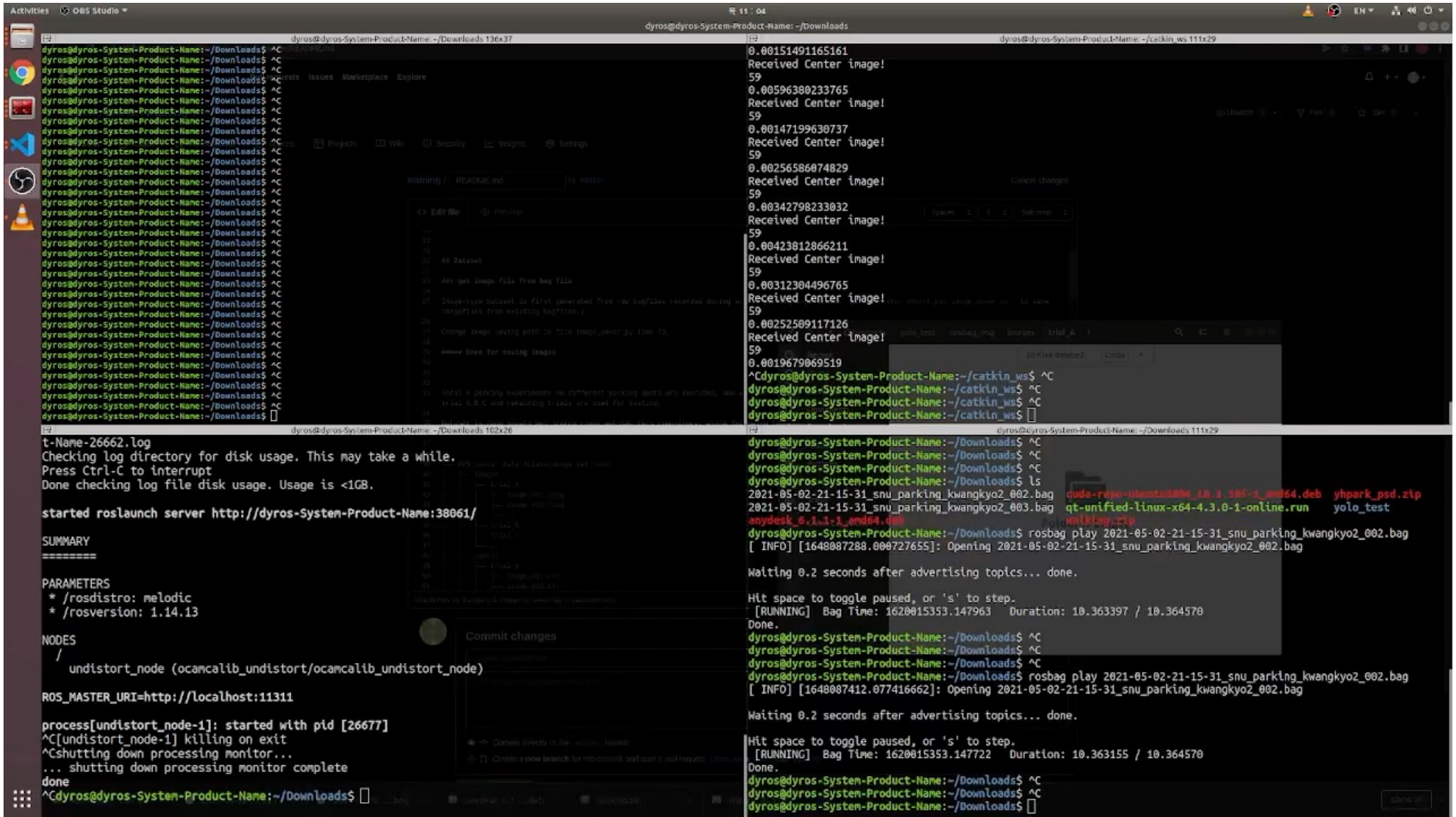
Presentation File: link

1. YOLO training

- **1-1. Dataset 구조**
  - **AVM_center_data_4class** → dataset (이름)
  - **trial_A, B, C…** → 각각 다른 주차 시나리오의 dataset
  - **image_xxx.txt**→ 이미지에서 corner point x y 좌표, corner point 타입
- **1-2. Training**
  a. **Annotation**
  b. **split_generator**로 (train/test/validation) 세 종류 시나리오로 나눈다
  c. **Training**

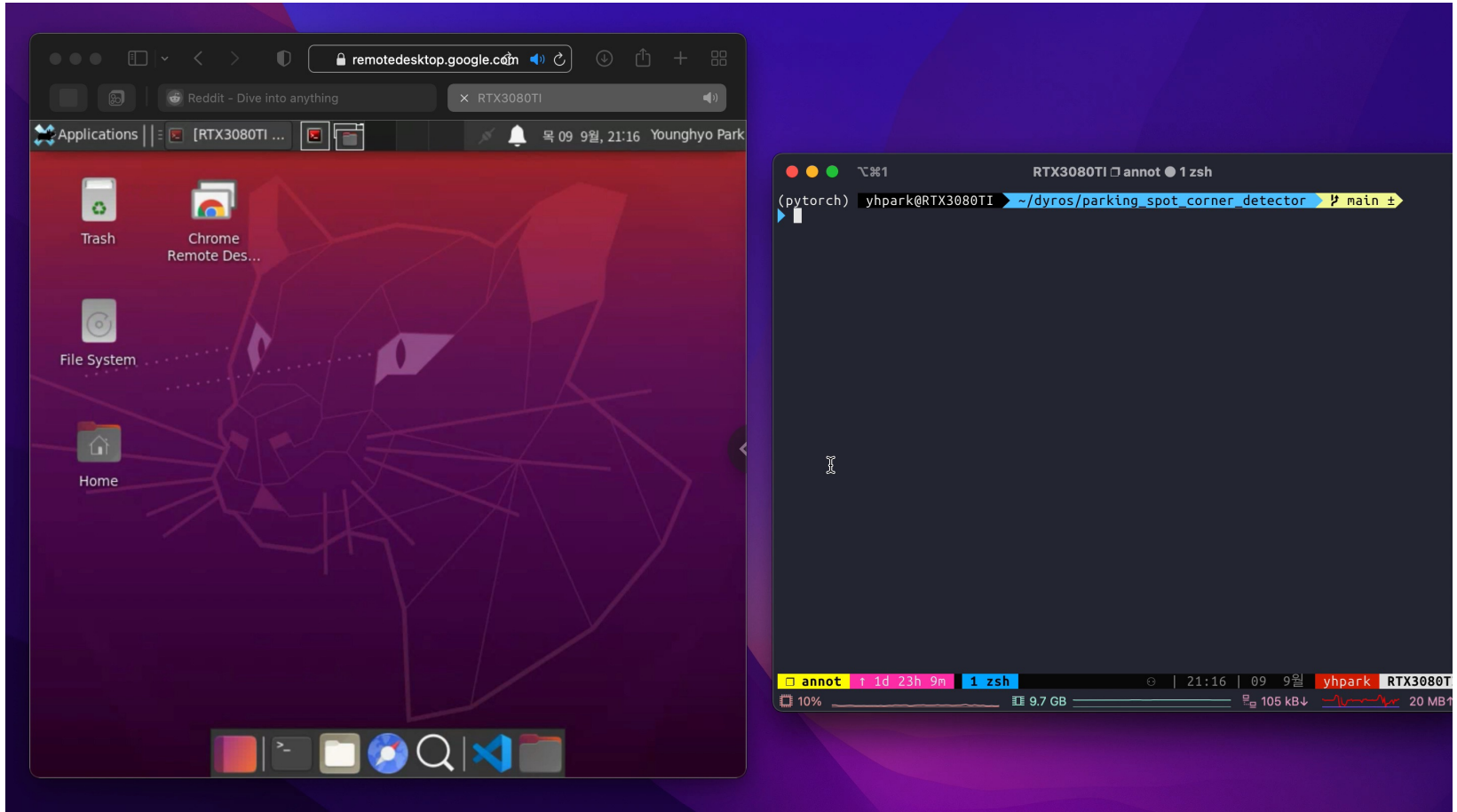


1-1. Dataset 만드는 workflow



1-2-a. Annotation - YOLO training

- AVM 이미지에 marking point 클릭 전, 키보드로 marking point 종류 선택 option(A = outer ,S = inner ,D = outer aux, F = inner aux)

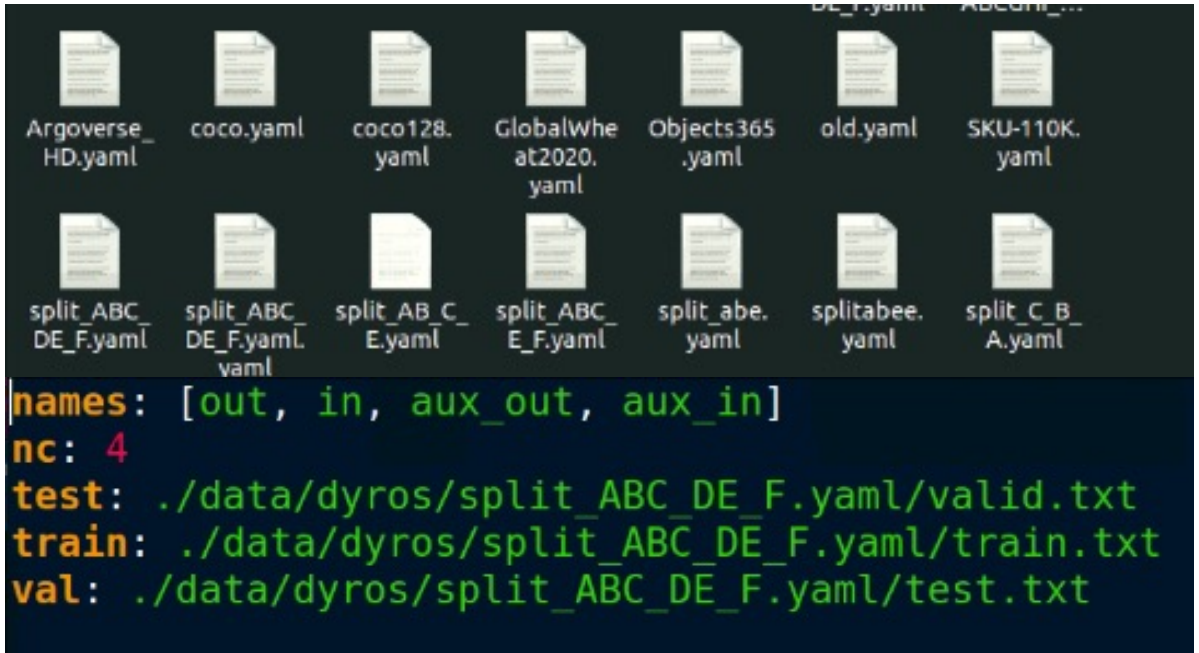


1-2-b. Split - YOLO training

- 주차 실험 episode 별로 train / test / validation 분할

- parser(option) --train A,B,C --valid D,E --test F 입력 시 data 폴더에 split_ABC_DE_F.yaml 생성

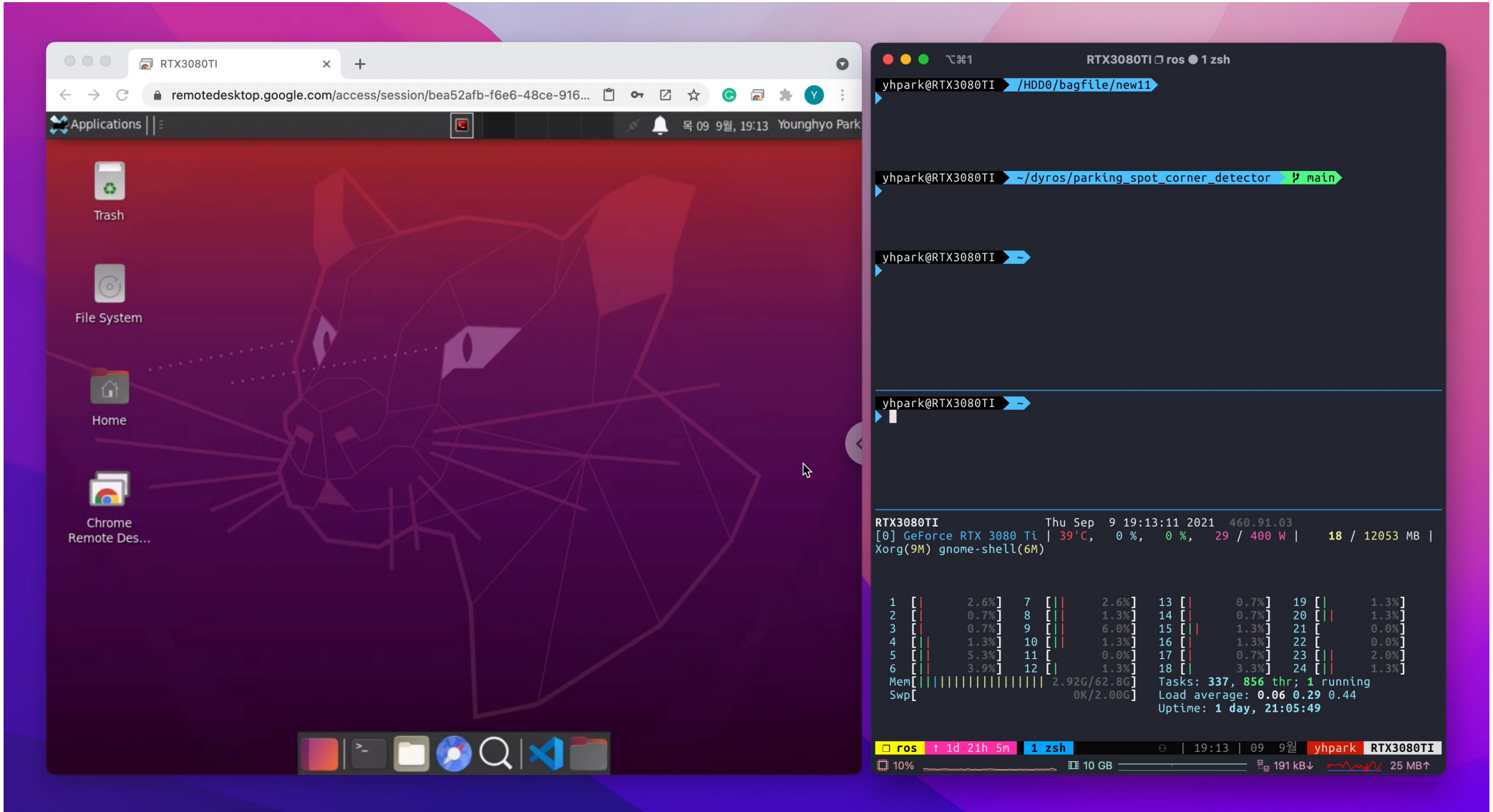
- 예시



1-2-c. Training - YOLO training

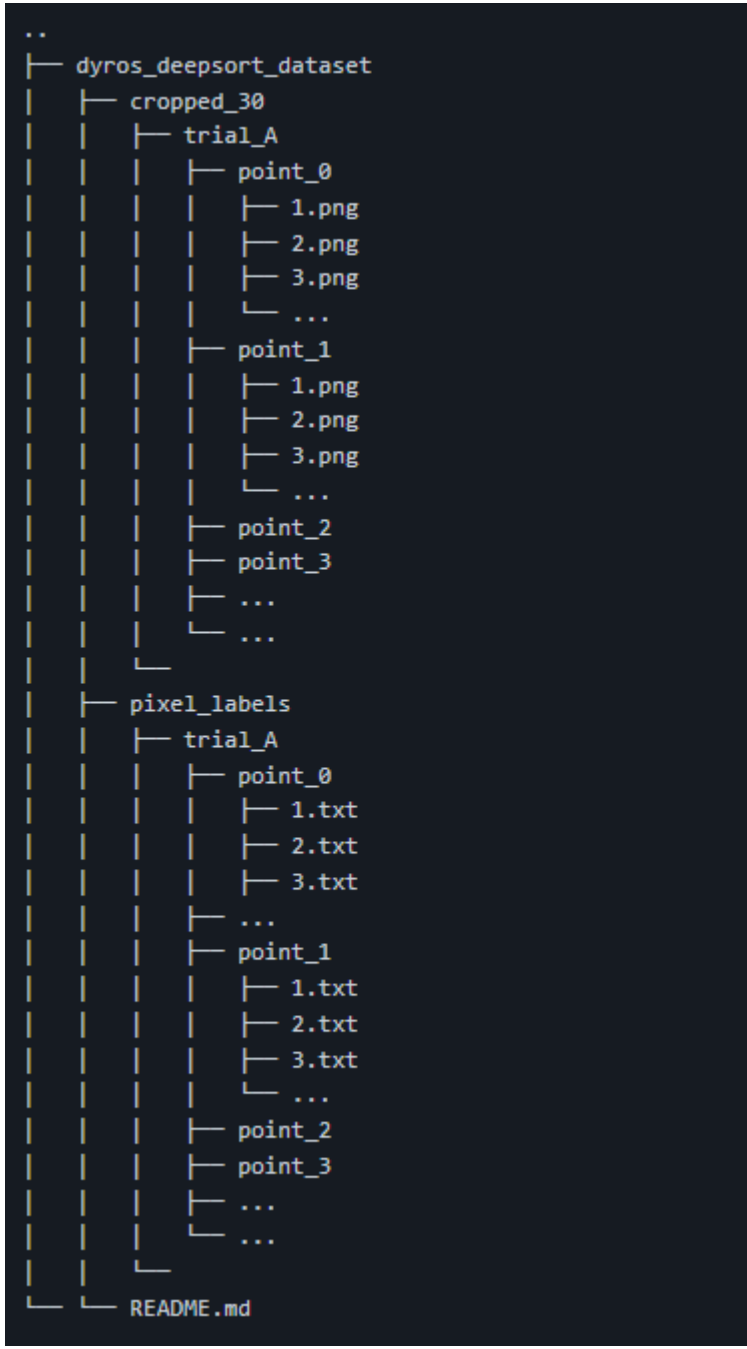
- trained weight 이 ./runs/train/yourexperiment/last.pt, best.pt 로 저장됨
- best.pt 트레이닝 동안의 best weights.
- last.pt last epoch의 weights.
- --view-img parser(option) 로 opencv window 통해 live result 볼 수 있음

Marking Point Detection Workflow



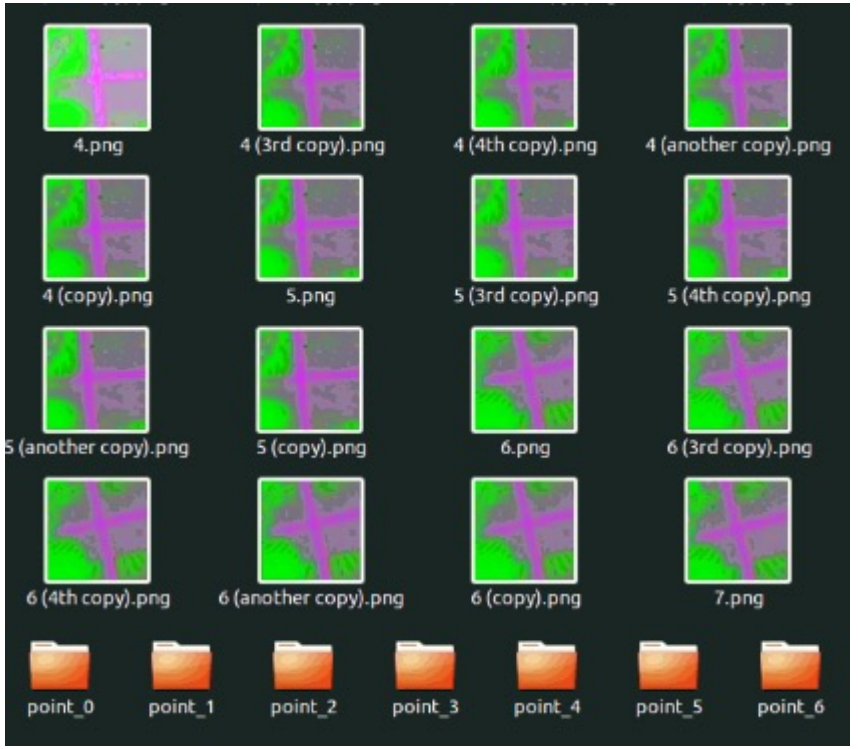
2. DeepSORT training

- 목적: corner point ID switching을 줄이기 위해서
- **Dataset structure**
  - **dyros_deepsort_dataset** → dataset (이름)
  - **cropped_30** → cropped 사이즈
  - **trial_A, B, C…** → 각각 다른 주차 시나리오의 dataset
  - **point_1, 2, 3…** → 각 corner point 분류
- **Training**
  a. **Annotation** (cropped image of points)
  b. **Training** (Siamese training)



2-a. Annotation(cropped image of points) - DeepSORT training (refinement)

- Cropped image 예시 → corner points



- Annotation point by point 로 진행됨.
- AVM 이미지에서 corner point 선택 시 cropped corner point → dataset/cropped_(bb_size)/trial_A 폴더에 저장
- Corner point x y 좌표 → dataset/pixel_labels/trial_A 폴더에 저장
- --crop-only parser for cropping corner points only(corner point x y 좌표 생기지 않음)

2-b. Training(Siamese training) - DeepSORT training(refinement)

- 트레이닝 시작 전 siamese_training.py 65번째 줄 dataset 경로 확인
- 요구하는 성능, 환경에 따라 hyperparameter 튜닝 필요
- ./deep_sort_pytorch/deep_sort/deep/experiment_name.pth’ 경로에 .pth 파일 저장됨
- detect or ROS_track_marking_points.py 의 –refinements_weight parser 로 사용함.