

Weekly Progress Report

Dec 6th - Dec 10th, 2021

Presented by Yannis (Yiming) He 84189287

Noah's Ark | Autonomous Driving Lab
LiDAR Domain Adaptation

Manager: Bingbing Liu 00435285
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Weekly Summary

- Done:

- Reproduced the results from Xingxin's once_kitti-format_z_offset=1.2
- Compare performance for once-z_offset=1.2 vs 1.25 → 1.25 is better
- Verifying the effectiveness of densified pointcloud on ONCE
 - Generate ONCE info files for **densified** pointcloud with z_offset=1.25
 - Experiment on kitti-style-densified(MFD)-z_offset1.25-Naive DA
 - Densified M2 validation set and repeat the Naive DA on M2_MFD

- In Progress:



- Fine-tuning (train on ONCE_MDF → test on M2)
- MFD parameter experiment (optimize the hyper-parameters)

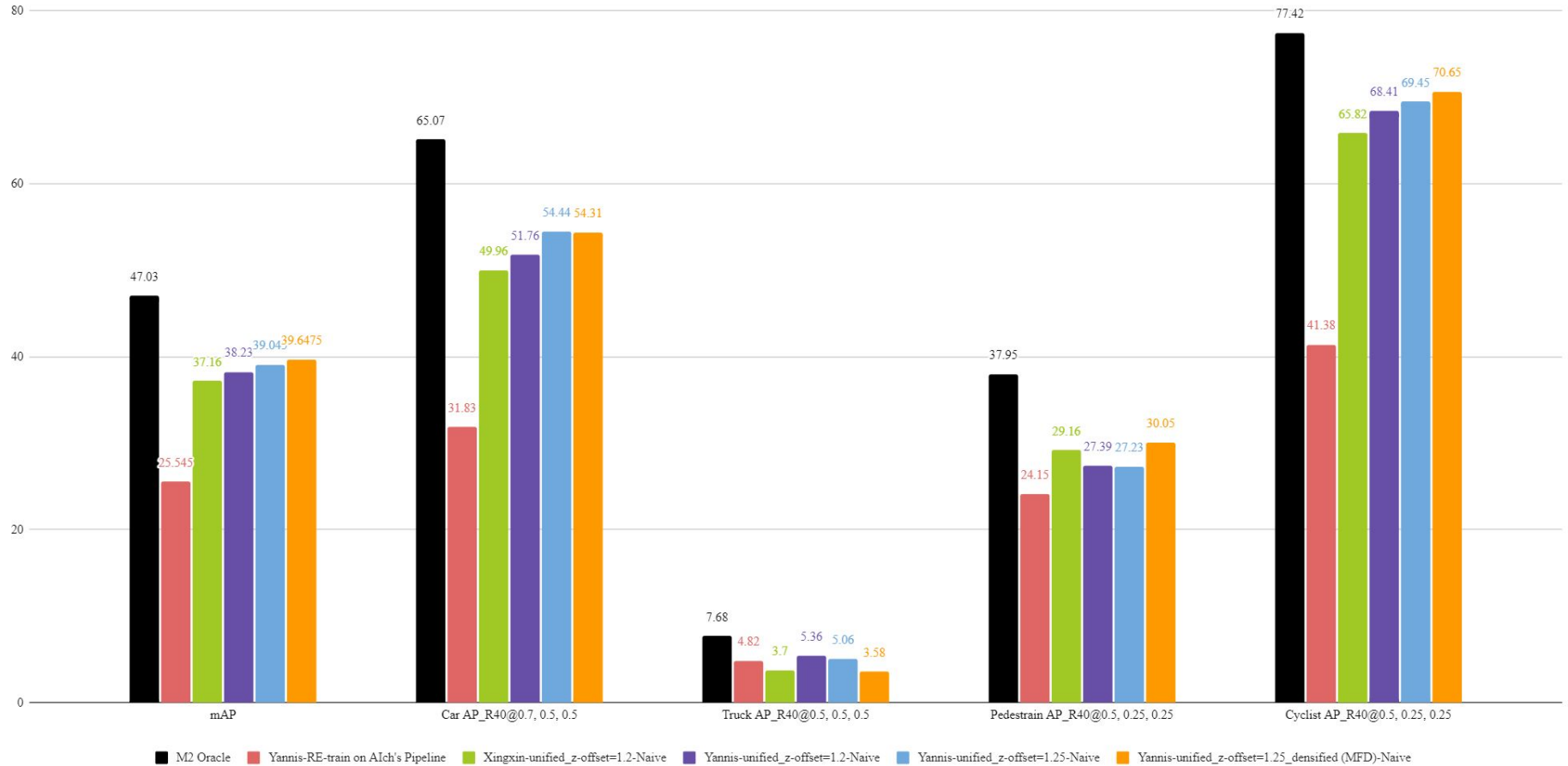
- Recent Goals:

- Incorporate Mrigank's DSBN
- MFD range experiment
 - No need to densified nearby object. Only densify far-away objects

- TODO:

- Implement densification on P40 (if densification is working)
- P40 oracle training on undensified data (to make sure it's working)
- Train p40 with augmentation (only insertion of GT object)
 - to understand the false positive/negative
- Experiment on p40 densified pointcloud (baseline, ROI, z_offset, etc)

ONCE -> M2 DA



Work Logs

- Dec 6 (Monday)
 - Reproduced Xingxin's result on "once_kitti-format_offset1.2"
 - TODO:
 - Generate info files for "once_not-densified_kitti-format_offset1.25"
 - Train on "once_not-densified_kitti-format_offset1.25" and compare performance with offset 1.2
 - Test on m2 to compare
 - $X = \max(\text{performance of offset}=1.2, \text{performance of offset}=1.25)$
 - Prepare dataset from
 - "once_densified_once-format_offset0_wo_info" \rightarrow "once_densified_kitti-format_offset X _w_info"
 - Train on the "once_densified_kitti-format_offset X "
 - Test on m2

Work Logs

- Dec 7 (Tuesday)
 - Generated info files for “once_not-densified_kitti-format_offset1.25”
 - Experiment: “once_not-densified_kitti-format_offset1.25”
 - compared performance with offset 1.2 → **z_offset 1.25 is better**
 - 1.25 = max (performance of offset=1.2, performance of offset=1.25)
 - Prepared dataset (Thanks to Xingxin’s help):
 - From: “once_densified_once-format_offset0_wo_info”
 - generated: “once_densified_kitti-format_offset1.25_w_info”
 - Experiment: “once_densified(MFD)_kitti-format_offset1.25” → **current best** Naive DA



Model Free Densification

Work Logs

- Dec 8 (Wednesday)
 - Add bar for once without rotation (from Aich's slides)
 - Densified M2 validation set and repeat the Naive DA on M2_MFD
 - MFD range experiment
 - No need to densified nearby object. Only densify far-away objects
 - MFD parameter experiment (optimize the hyper-parameters)
 - Fine-tuning (train on ONCE_MDF → test on M2)
 - Incorporate Mrigank's DSBN

Work Logs



Dec 9-10 (Thursday & Friday)

- To compare with results from Mrigank, we repeat Experiments using Best Checkpoint:
 1. Train on ONCE_MFD | evaluate on M2
 2. Train on ONCE_MFD , finetune on M2 | evaluate on M2
 3. Train on ONCE_MFD , finetune on M2_MFD | evaluate on M2_MFD
 4. Train on ONCE_MFD , finetune on M2_MFD | evaluate on M2_MFD

End of December 6th, Weekly Report

Weekly Progress Report

Dec 13th - Dec 17th, 2021

Presented by Yannis (Yiming) He 84189287

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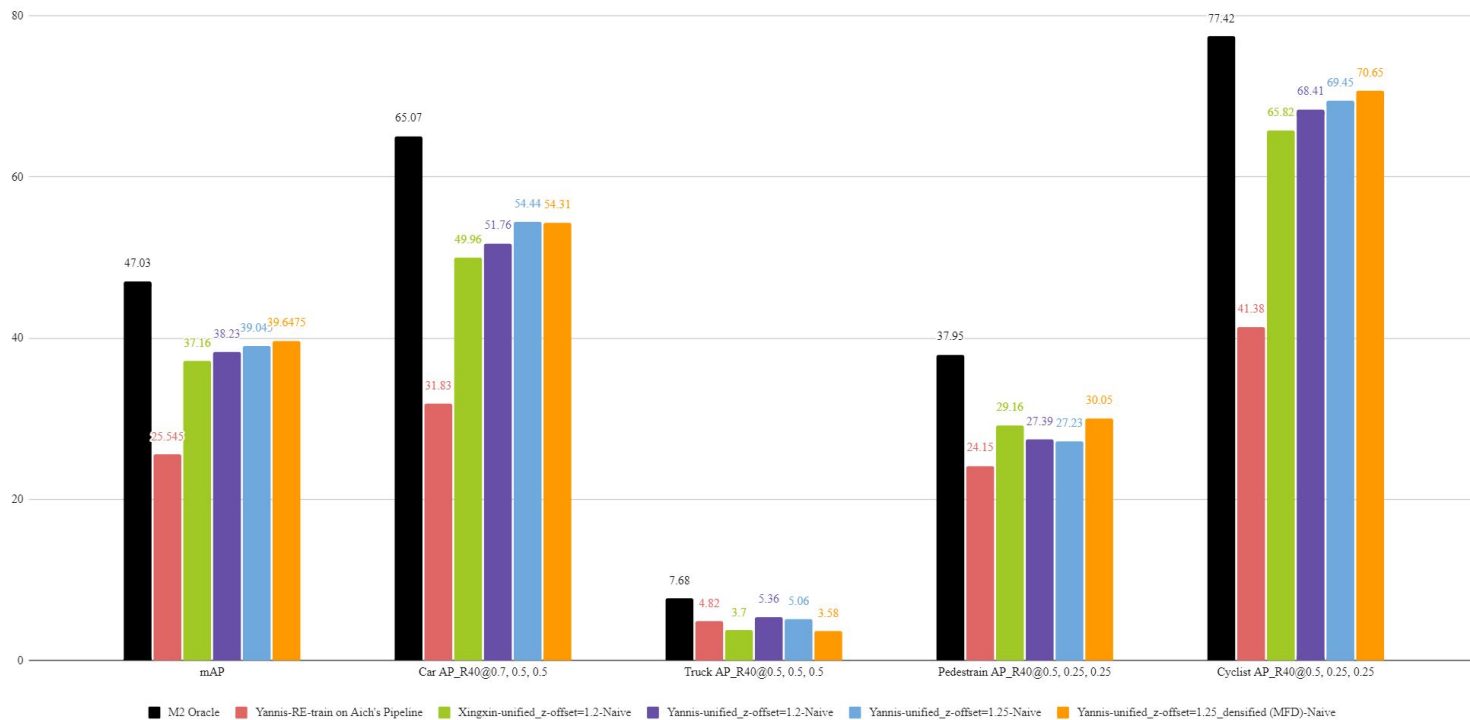
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Weekly Summary

- **Done:**
 - Experiment on ONCE_offset & Naive DA on M2
 - Fine-tuning (train on ONCE_MDF → test on M2)
- **In Progress:**
 - ➡ - MFD parameter experiment (optimize the hyper-parameters)
 - Max_Point_Per_Voxel (MPPV) = 5, 10
 - Finetune_Learning Rate (FTLR) = $3e-4$, $3e-5$
 - Experiments on new ONCE-dataset (currently generating by Eduardo, to be copied to gx9)
- **Recent Goals:**
 - Incorporate Mrigank's DSBN
 - MFD range experiment
 - No need to densified nearby object. Only densify far-away objects
- **TODO:**
 - Implement densification on P40 (if densification is working)
 - P40 oracle training on undensified data (to make sure it's working)
 - Train p40 with augmentation (only insertion of GT object)
 - to understand the false positive/negative
 - Experiment on p40 densified pointcloud (baseline, ROI, z_offset, etc)

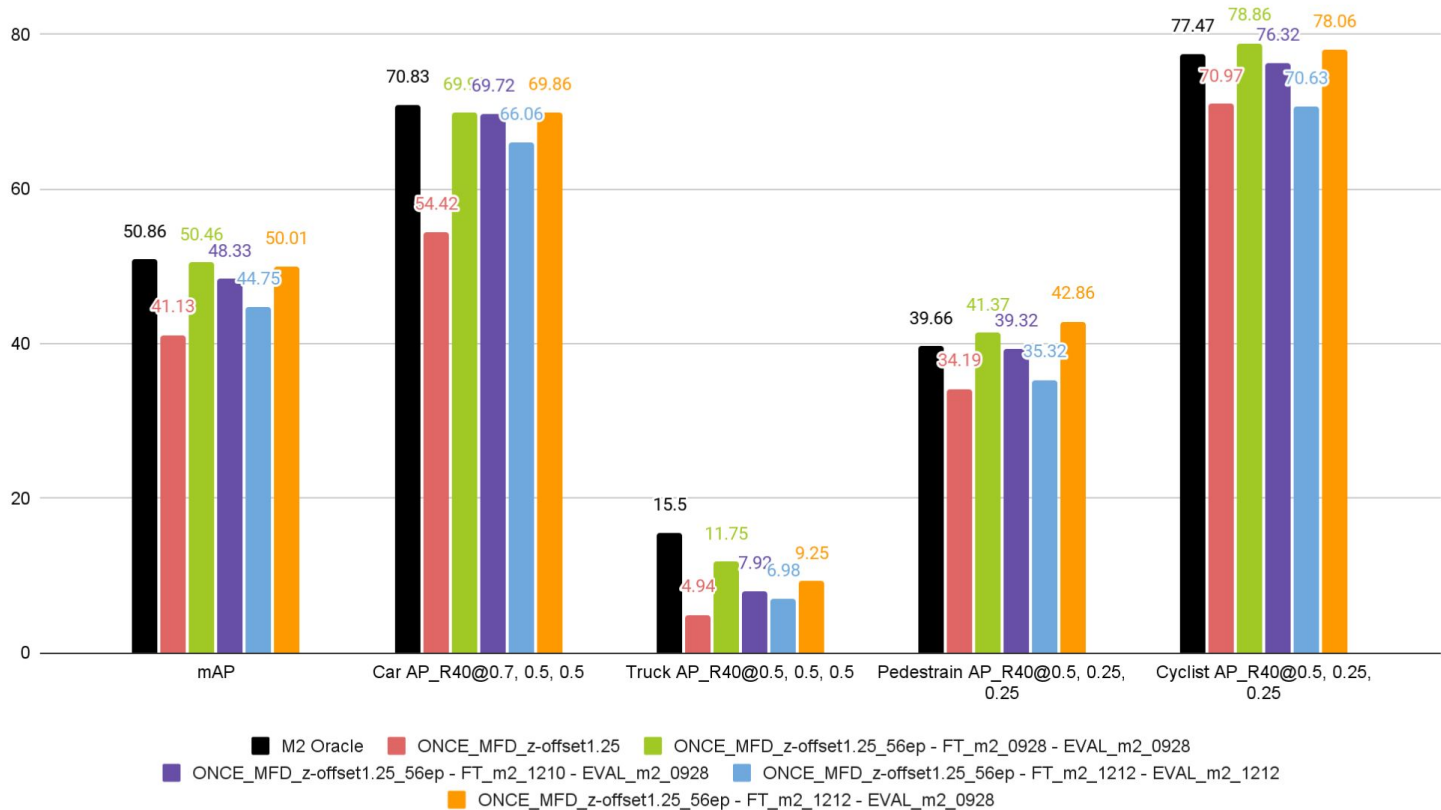
ONCE -> M2 Naive DA (all using 80th epoch)



Conclusion:

1. For ONCE → M2: add z_offset=1.25 is the best
2. Densification on source dataset increase performance (specially for small objects, i.e. pedestrian & cyclist)

ONCE -> M2 Finetune



Note: M2_0928: sparse m2_1212: dense

Work Logs

Max_Point_Per_Voxel	LR = 3e-4	LR = 3e-5
5	in-progress	TBD
10	TBD	TBD

End of December 6th, Weekly Report