When mobility companies create innovative services,○○○ / Hyundai Harmony B 16

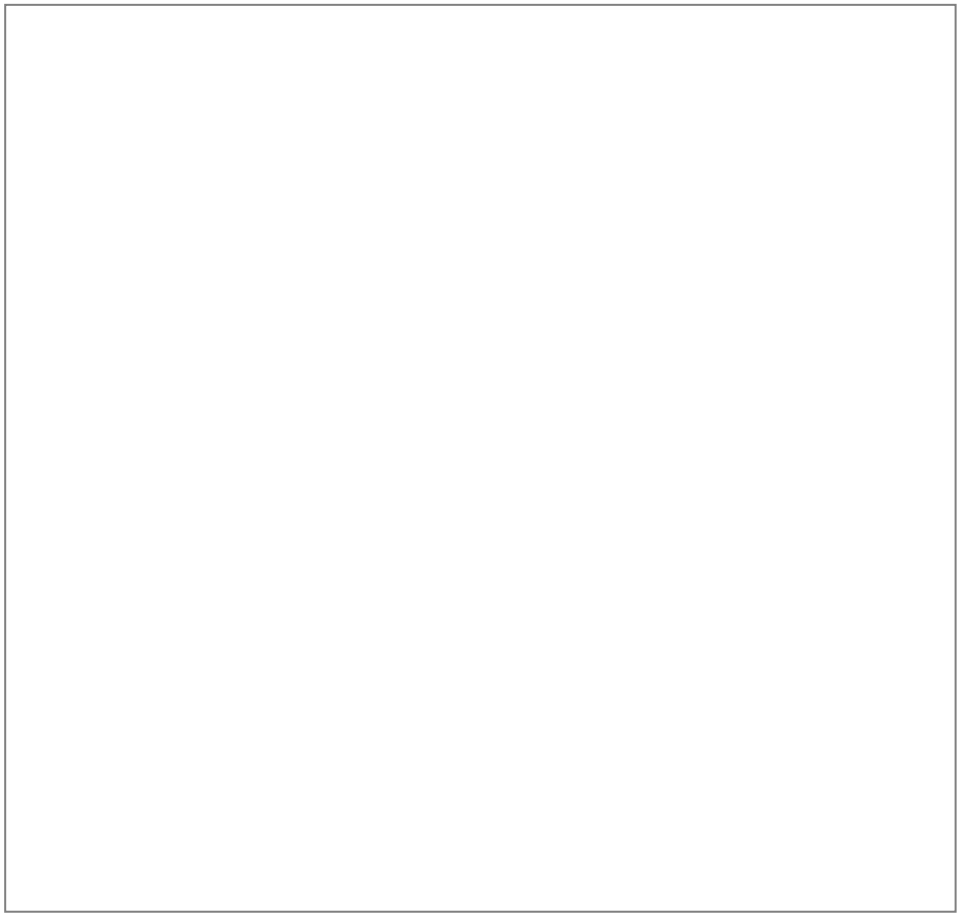
- (Sub description required) / Hyundai Harmony M 16

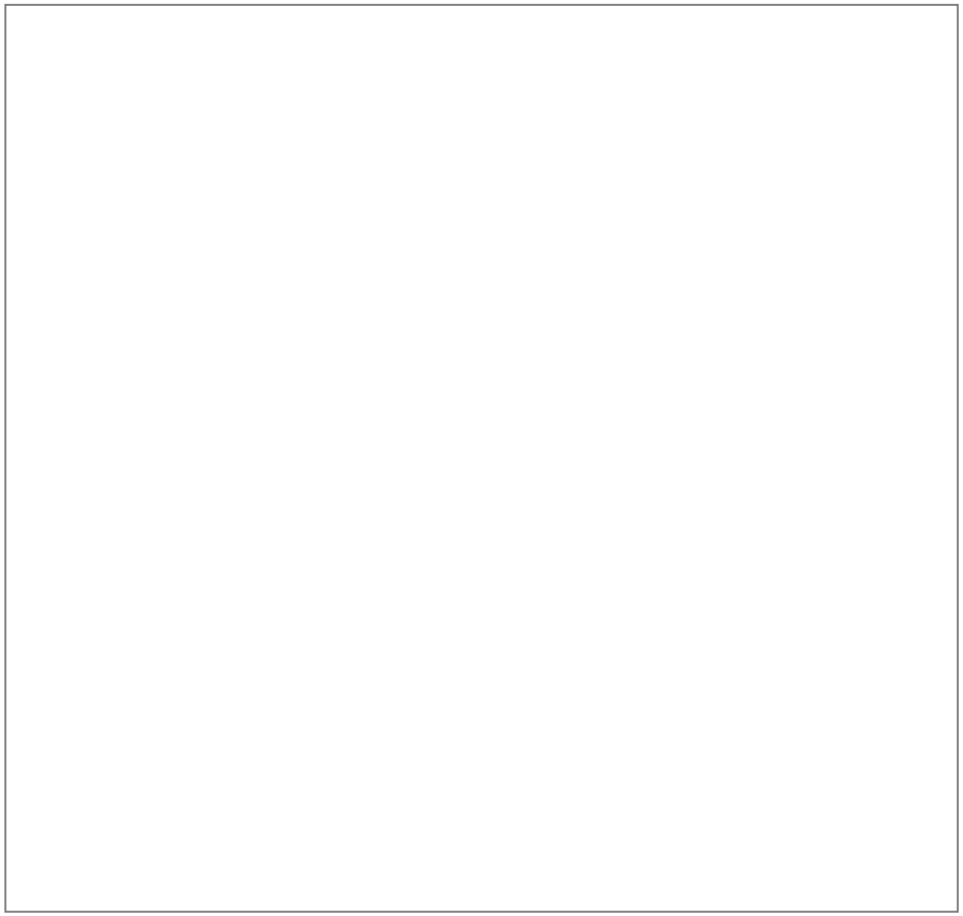
Title / Hyundai Harmony M 14

- A variety of services on one platform / Hyundai Harmony L 13
  - Portal / SNS / Activate Commerce/ Hyundai Harmony L 12

Title / Hyundai Harmony M 14

- A variety of services on one platform / Hyundai Harmony L 13
  - Portal / SNS / Activate Commerce/ Hyundai Harmony 12





# Overview-MCAM

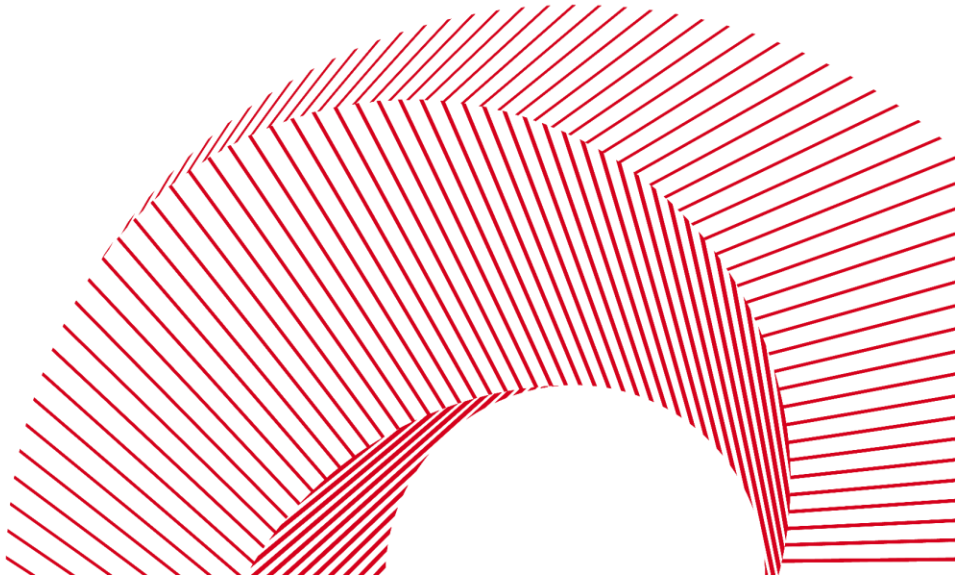
| | |
|---|---|
| Nadeem | Clean up of VG code, evaluation of Ego Motion on keypoints |
| Victor | Integration of VO node in ECO 2 board |
| Yuanyuan | Pipeline of MCAM eval report, AOC for SVM |
| Isheeta | RPE integration in camera repo, RPE validation using NN road segmentation |

HYUNDAI MOBIS

# Nadeem Gul

## MCAM 1.0

2024.10.21



## Sprint Tasks

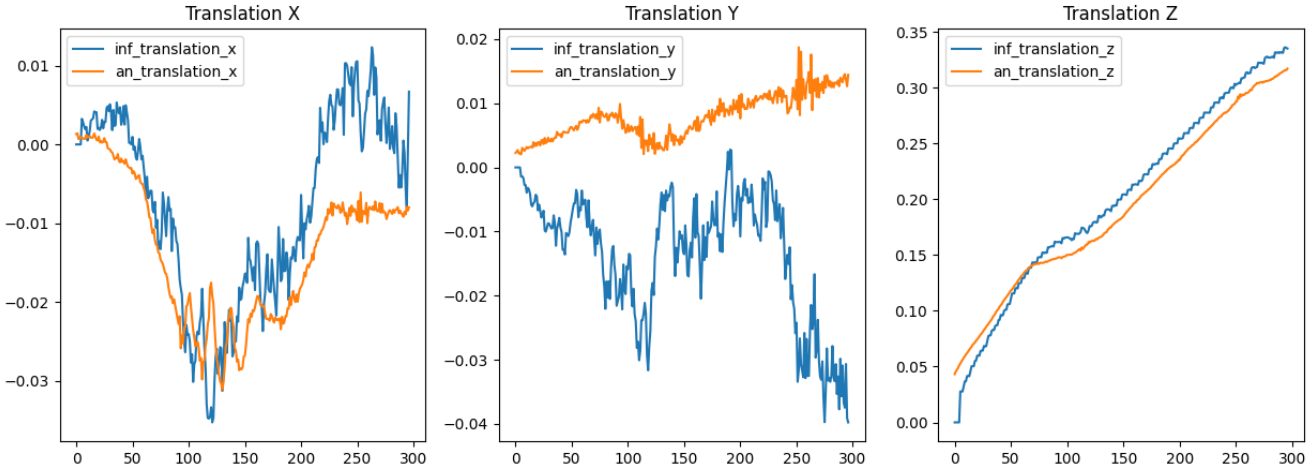
- Clean up Vision Geometry code
  - Remove unused Ego Speed Estimation, Ego Motion Outlier Rejection and Road Plane Kalman filter components
  - Restructure code for better readability
- Evaluation Ego Motion with keypoints
  - Setup MAF SIL environment. (Many thanks to Prabhash)
  - Run and evaluate ego motion with the keypoint matches

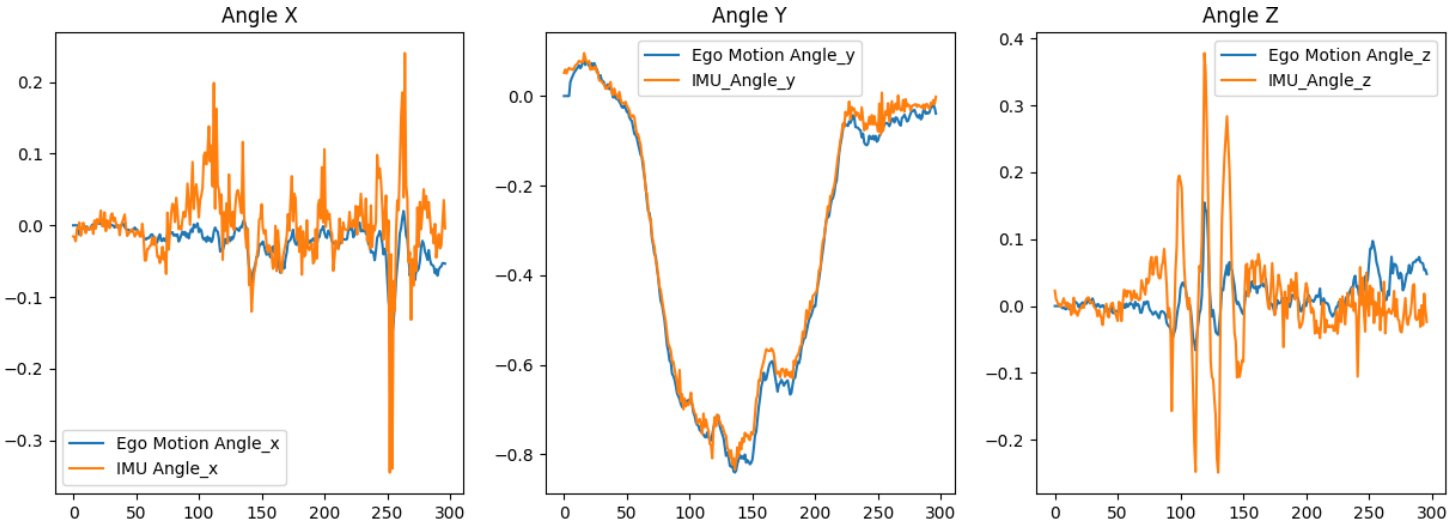
# Sprint Tasks

# Sprint Tasks

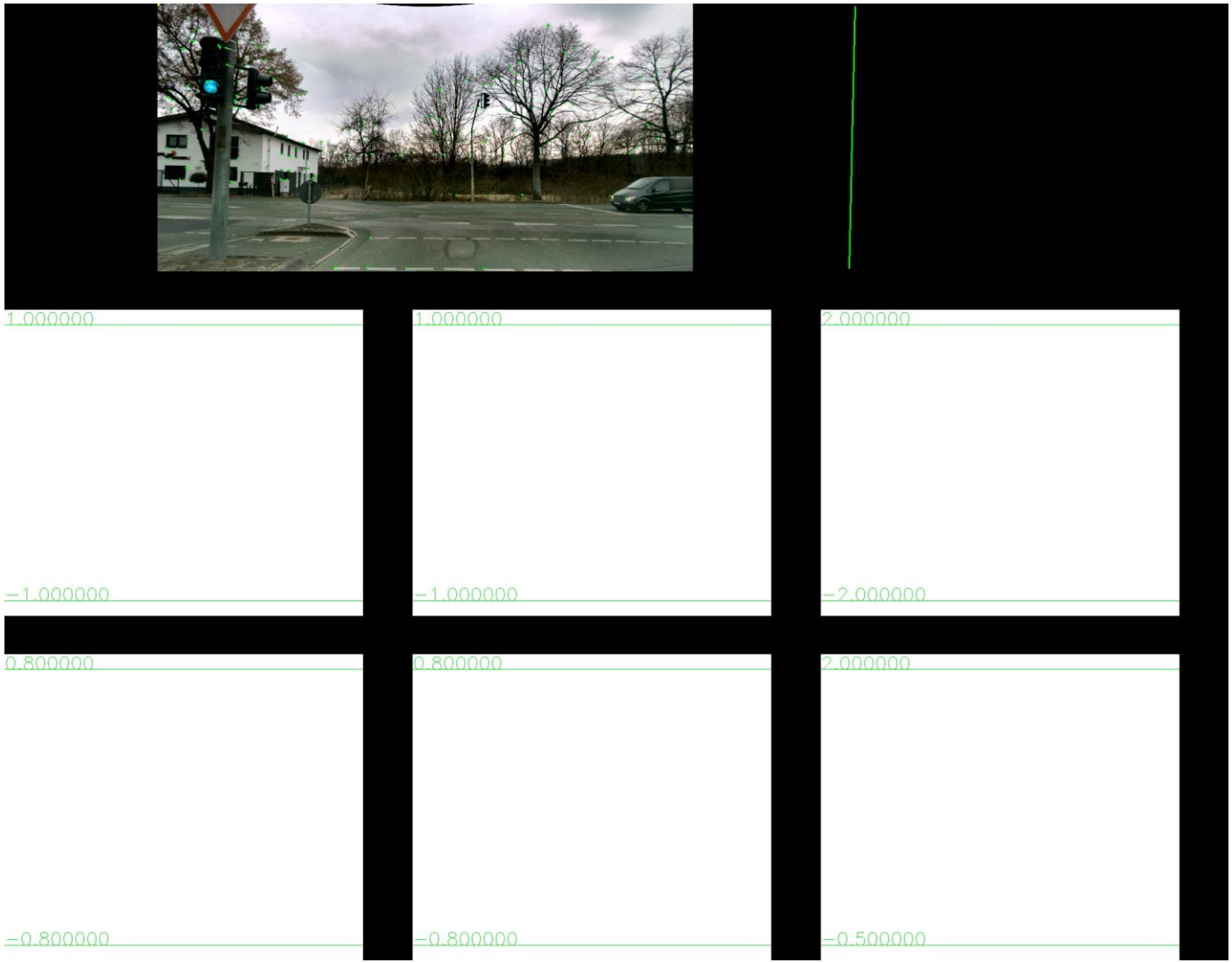
- **Ego Motion evaluation with keypoints**
  - Average Rotation Error: 0.737°

| Component | MAE |
|---|---|
| Translation X | 0.695 cm |
| Translation Y | 2.14 cm |
| Translation Z | 1.54 cm |
| Angle X | 0.034° |
| Angle Y | 0.0218° |
| Angle Z | 0.0439° |



- **Ego Motion evaluation with keypoints**

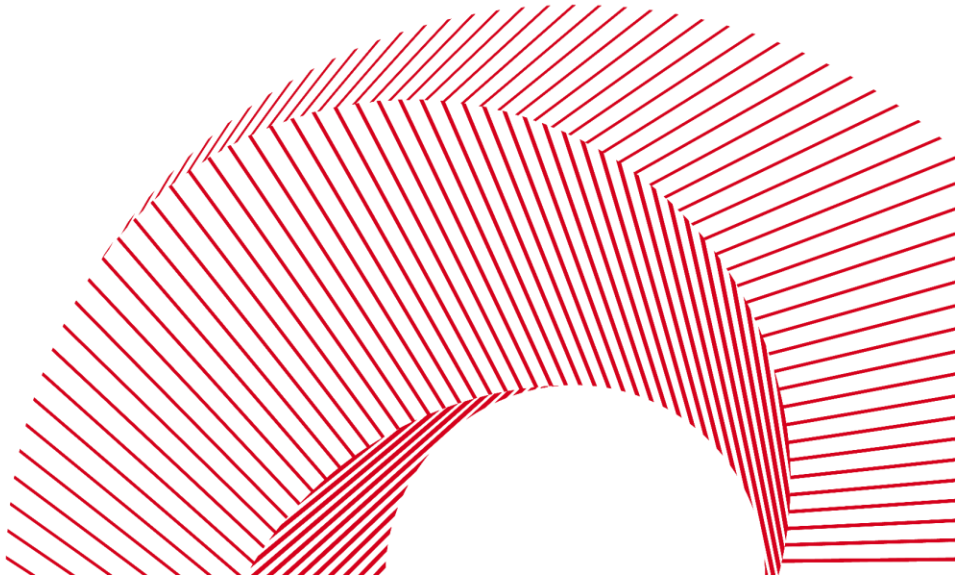


HYUNDAI MOBIS

# Victor Jimenez

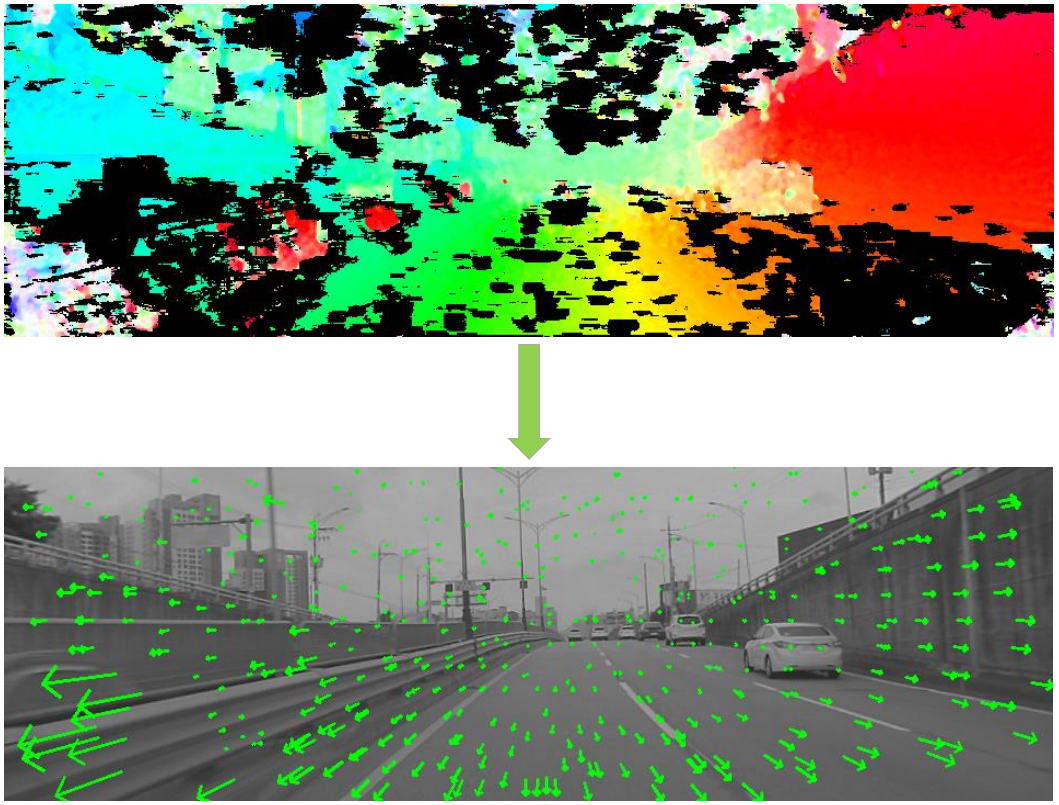
## MCAM 1.0

2024.10.21



# Integration Status

- Direction of optical flow fixed
- Runtime w/ static road mask is ~ 3ms on avg.
- Bugfix in .bin file of the config related to undistortion
- Visualization of DOF resulting on ECO camera
- Failed to mount nfs filesystem (/m & /i) on board ☹ , nevertheless, thanks @Dominik

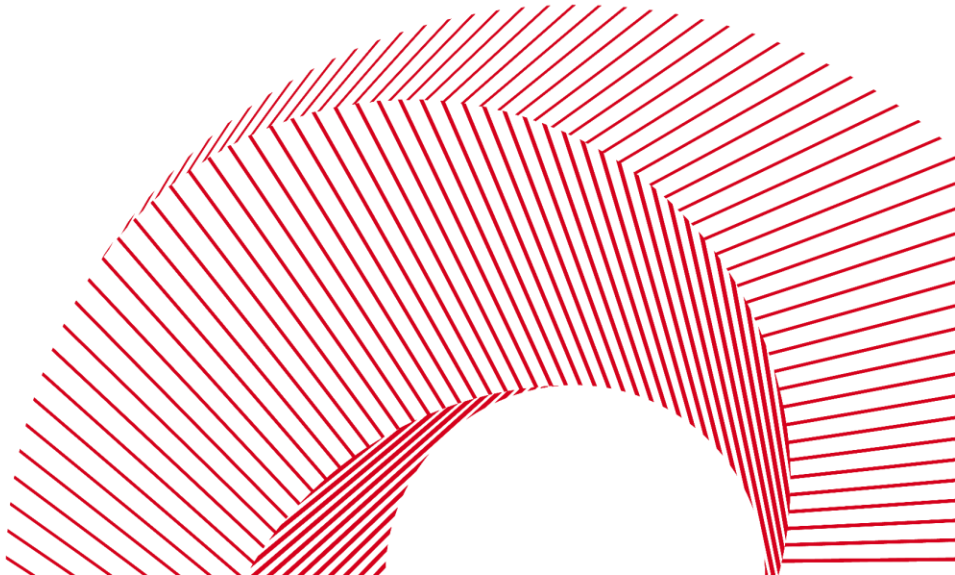


HYUNDAI MOBIS

# Yuanyuan Mao

## MCAM 1.0

2024.10.21



# Sprint Tasks

- MCAM Eval Report
  - ✓ Write TeX template for the report
  - ✓ Automated AOC results inserting
  - ✓ Log ego motion and road plane evaluation results

- AOC on SVM camera
  - ✓ Data selection and conversion
  - ✓ Log inference for 4 SVM cameras
  - ✓ Test the AOC results (WIP)

- Test AOC Params for MTCK (WIP)

- Sprint Review

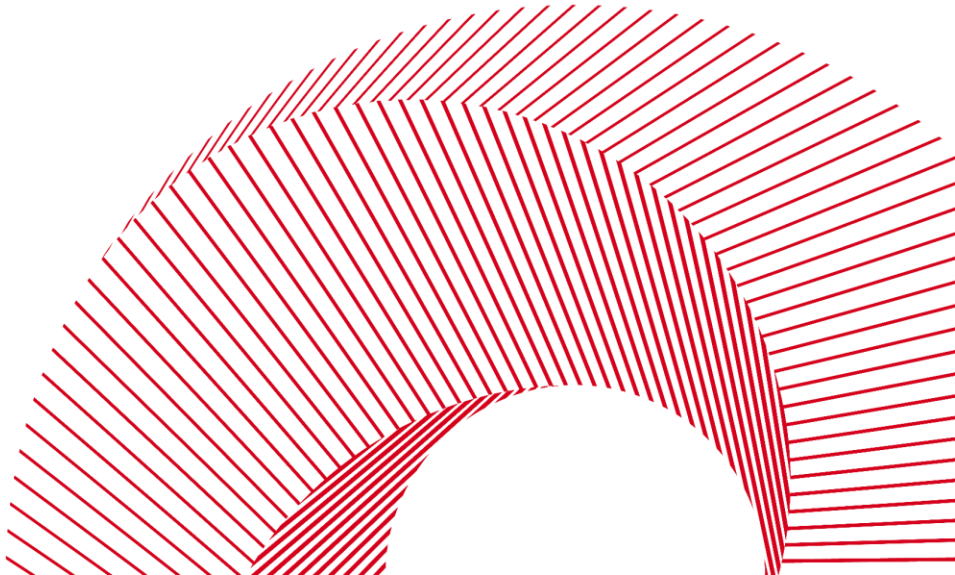
- 1 Day Sick Leave

HYUNDAI MOBIS

# Isheeta Jha

## MCAM 1.0

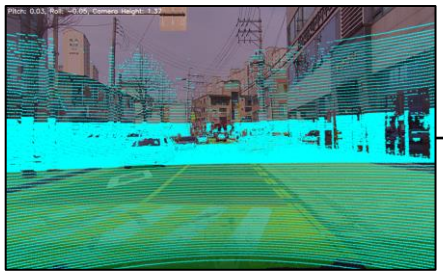
2024.10.21



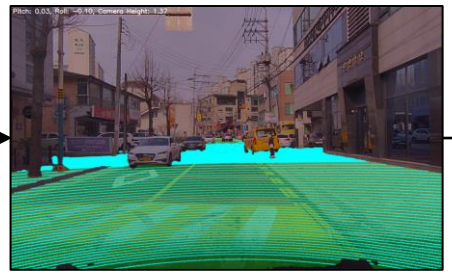
# RPE evaluation pipeline update

NN freespace segm
entation using MPA
Joint SD-OD

Highlighted region is th
e expected road for RP
E



Lidar point cloud



Lidar point cloud filtere
d using segmentation m
ask

Lidar point cloud further f
iltered based on range

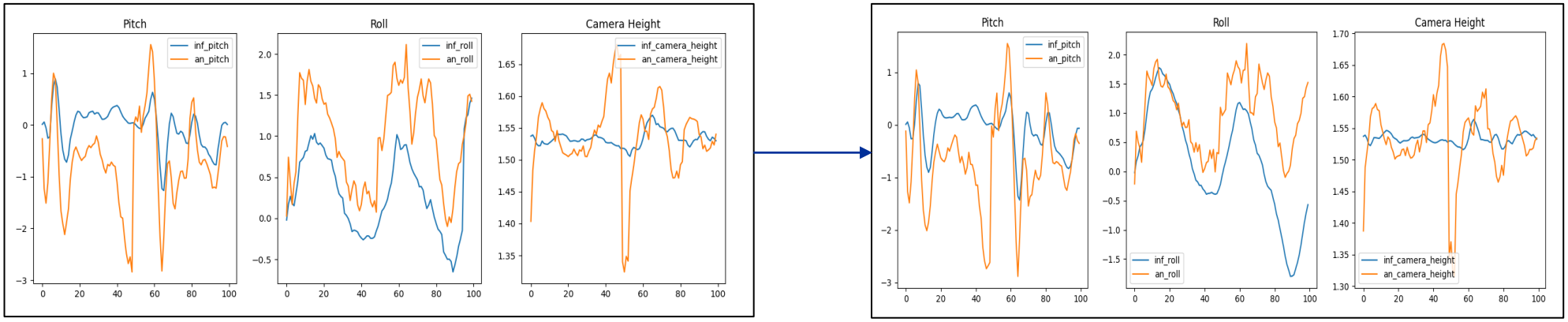
Inliers/Outliers

TODO: Add speed bump class to get more accurate road plane estimate

# RPE integration into camera repo

- Integrated RANSAC as a new VRA (Earlier it was inside OCC)
- No history maintained for OCC and no median filtering
- Performance on day scenes worse ->numbers look worse, could be due t o median filtering(TODO: debug)

| | RANSAC(+median filter )+VDC | New VRA RANSAC+VD C |
|---|---|---|
| RMSE camera height error (cm) | 2.95 | 2.96 |
| RMSE normal error(°) | 1.19 | 1.75 |
| RMSE pitch error(°) | 0.75 | 0.68 |
| RMSE roll error(°) | 0.913 | 1.61 |




Plot of ground truth and prediction on the speed bump sequence(Left->RANSAC in OCC(median filtering)+VDC, Right->R ANSAC+VDC)