Supplymentary Materials to: Continuous Error Map Aided Adaptive Multi-Sensor Integration for Connected Autonomous Vehicles in Urban Scenarios

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A. Experiment in Simulated Urban Areas

Fig.1 and Fig.2 present the trajectories of the listed method in *sim-sunset 1* and *sim-night 1*, respectively. Compared with the results of *sim-sunset 1* in Fig.1, the VINS is more challenging in the illumination conditions such as night. As shown in Fig 3 and Fig.4, the error map of the listed method in *sim-sunset 1* and *sim-night 1* shows a similar phenomenon that VINS positioning error increased if the lighting conditions decreased. Fig. 5 and Fig.6 show the trajectories using the proposed method in sim-*sunset 2* and *sim-night 2*. The more accurate trajectory is estimated using the proposed method with the help of error map-aided weighting.

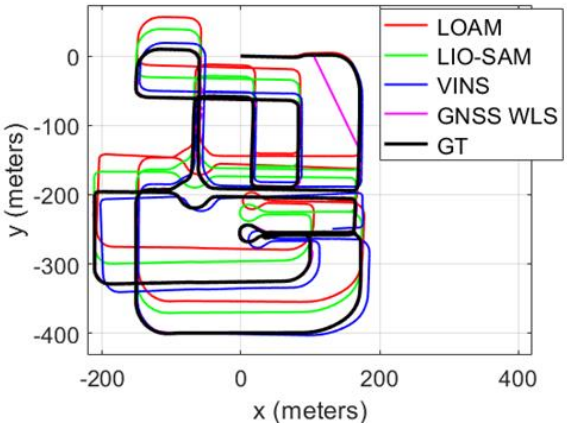

Fig. 1. Illustration of trajectories of the four methods under *sim-sunset 1*. The x-axis and y-axis denote the x and y directions, respectively.

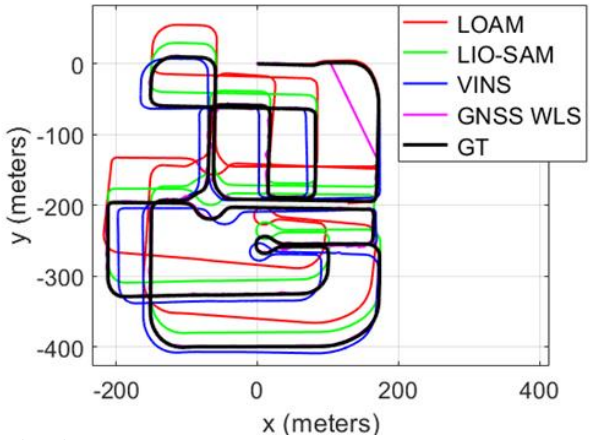

Fig. 2. Illustration of trajectories of the four methods under *sim-night 1*. The x-axis and y-axis denote the x and y directions, respectively.

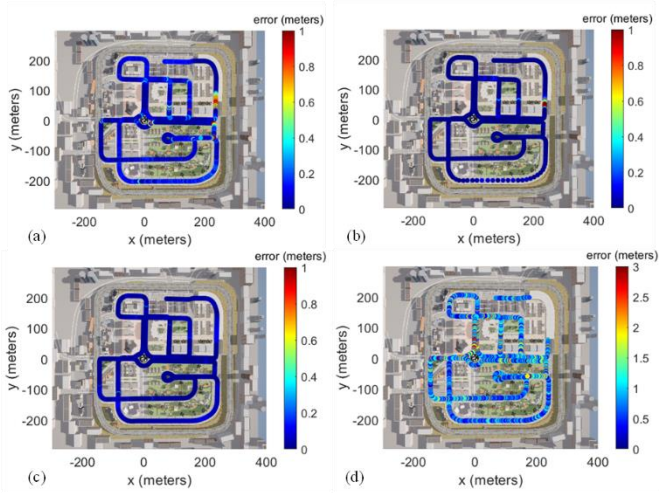

Fig. 3 Illustration of error map of the listed methods in data *sim-sunset 1*. (a) LOAM; (b)LIO-SAM; (c)VINS;(d) GNSS WLS.

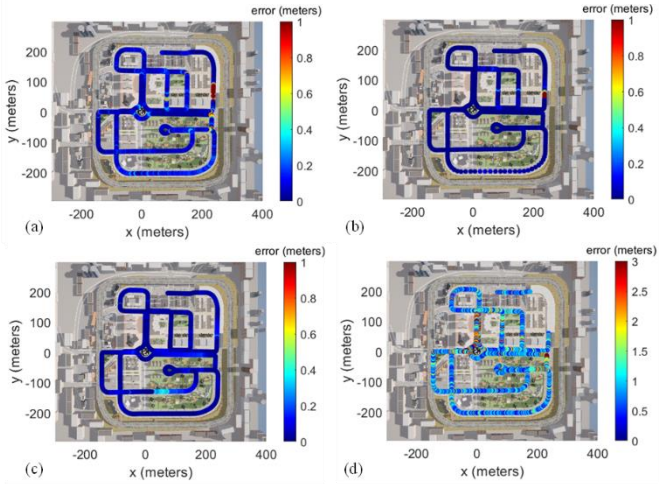

Fig. 4 Illustration of error map of the listed methods in data *sim-night 1*. (a) LOAM; (b)LIO-SAM; (c)VINS;(d) GNSS WLS.

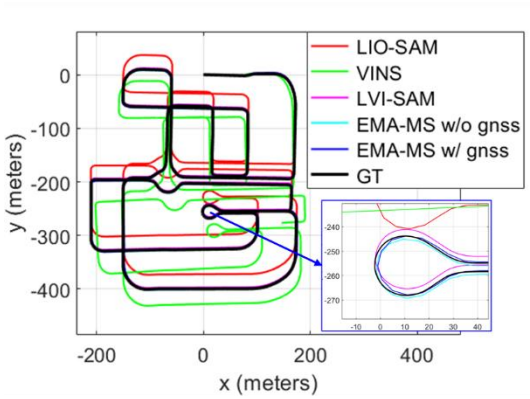

Fig. 5. Illustration of trajectories of the four methods under *sim-sunset 2*. The x-axis and y-axis denote the x and y directions, respectively. The area marked in blue is the zoom-in of the U-turn area.

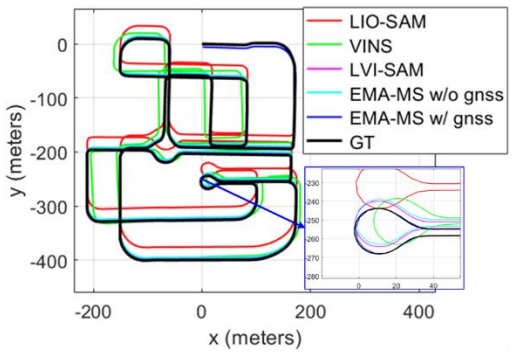

Fig. 6 Illustration of trajectories of the four methods under *sim-night 2*. The x-axis and y-axis denote the x and y directions, respectively. The area marked in blue is the zoom-in of the U-turn area.

B. Experiment in Hong Kong C-V2x testbed

Fig. 7 presents the trajectories of the listed method in *HK C-V2X-night 1* while Fig. 8 presents the error map of the listed method in *HK C-V2X-night 1*. Fig. 5 shows the trajectories using the proposed method in *HK C-V2X-night 1*. The more accurate trajectory is estimated using the proposed method with the help of error map-aided weighting.

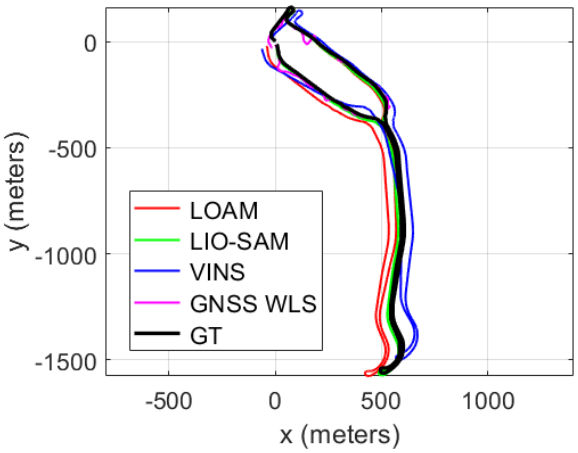

Fig. 7 Illustration of trajectories of the four methods under *HK C-V2X-night 1*. The x-axis and y-axis denote the x and y directions, respectively.

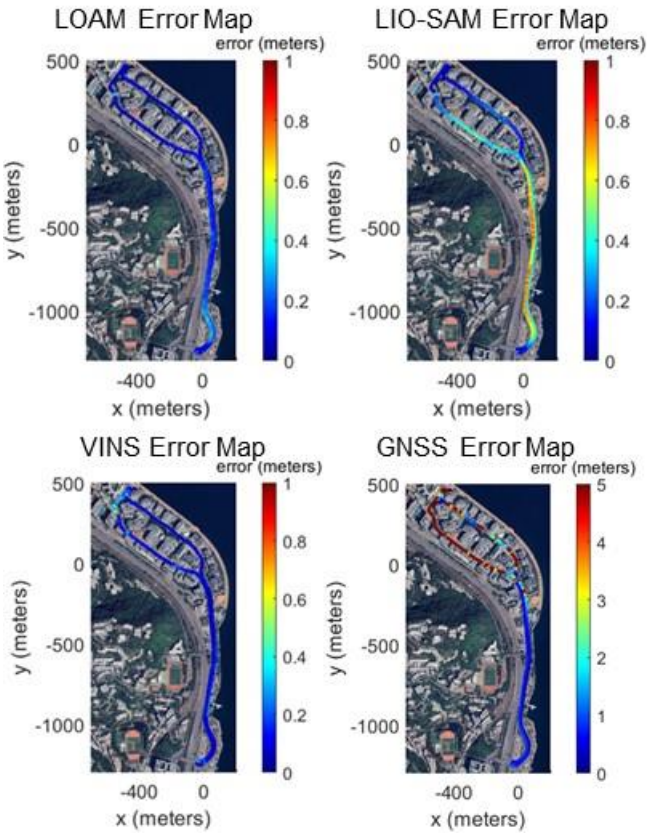

Fig. 8 Illustration of error map of the listed methods in data *HK C-V2X-night 1*. (a) LOAM; (b)LIO-SAM; (c)VINS;(d) GNSS WLS.

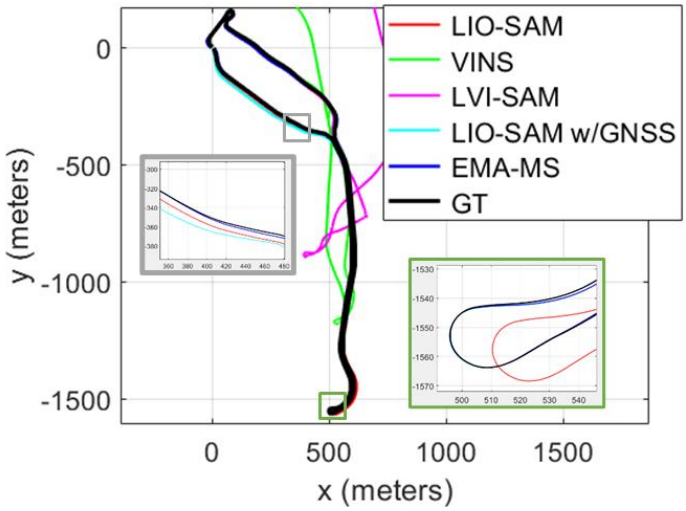

Fig. 9 Illustration of trajectories of the four methods under *HK C-V2X-night 1*. The x-axis and y-axis denote the x and y directions, respectively. The area marked in blue is the zoom-in of the U-turn area.