KI DELTA LEARNING
Scalable AI for Automated Driving

TransFuser: Imitation with Transformer-Based Sensor Fusion

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Problem: Geometric Fusion Lacks Global Context

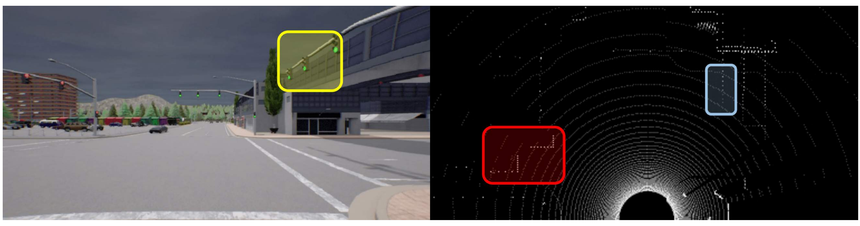

Figure 1: Illustration of a scenario requiring global context for safe navigation (© University of Tübingen)

- Geometric fusion aggregates features from the yellow to the blue region
- However, for safe navigation, it is useful to aggregate features to the red region which contains the vehicles affected by this traffic light

Key Idea: Attention-Based Feature Fusion

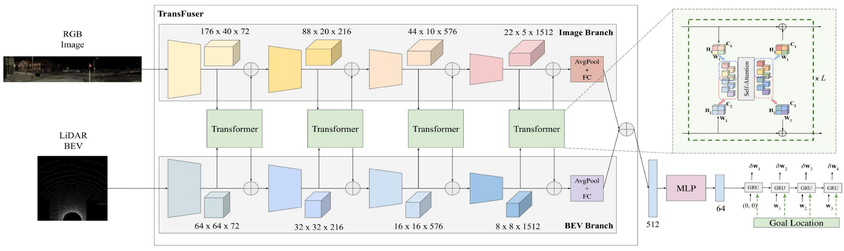

Figure 2: Architecture (© University of Tübingen)

- TransFuser captures the global context of the scene across modalities
- It uses a simple end-to-end training process based on imitation learning

Benchmark: CARLA Leaderboard

- 10 routes x 2 weathers x 5 repetitions
- 173 Km of driving experiences

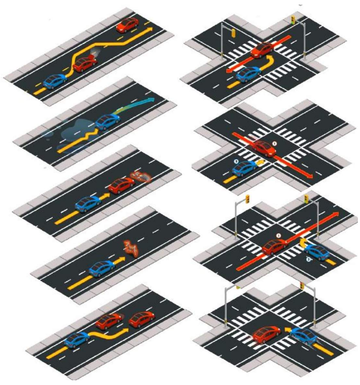

Figure 3: Safety-critical scenarios used for evaluation (© German Ros, Intel)

Method	Driving Score
LAV (Chen et al., CVPR 2022)	61.85
TransFuser (Ours, PAMI 2022)	61.18
Geometric Fusion (Ours, PAMI 2022)	41.70
GRIAD (Chekroun et al., Arxiv 2021)	36.79
WOR (Chen et al., ICCV 2021)	31.37

State of the art on the CARLA Leaderboard

Sensors

Partners

External partners

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