KI DELTA LEARNING
Scalable AI for Automated Driving

PlanT: Explainable Planning Transformers via Object-Level Representations

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Task

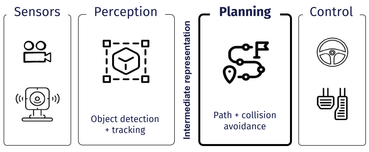


Figure 1: Driving Pipeline (© University of Tübingen)

- We consider the task of planning in an autonomous driving stack
- Planning is often done as a rule-based system
- We propose a learned planner

Motivation

Rule-based planning
− Hard to scale
+ Interpretable

End-to-End models
+ Scales with data
− Not interpretable

Learned planner: PlanT
→ Best of both worlds

Results

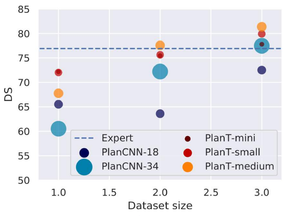


Figure 3: PlanT results (© University of Tübingen)

- Scaling dataset and model improves performance
- Expert level performance

Architecture

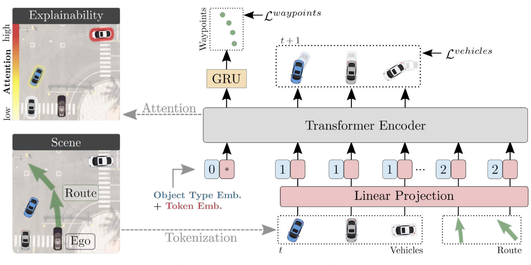
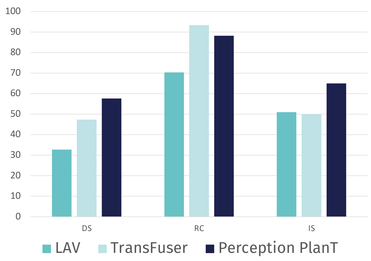


Figure 4: PlanT Architecture (© University of Tübingen)

- We train **a standard transformer encoder** from scratch
- The model is trained with a loss on **future positions** of the ego vehicle and the other vehicles

Results



- We add a perception module to the driving stack
- With the full model we obtain state of the art on the longest 6 benchmark

Explainability

Figure 5: PlanT attention (© University of Tübingen)

- Visualization of **attention weights** to show the **most important object**
- **Temporarily** more **consistent** than the CNN-based method + also takes **geometrically distant** objects into account

Code

Check out our paper and code

Training Strategies

Partners

External partners

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KI Delta Learning is a project of the KI Familie. It was initiated and developed by the VDA Leitinitiative autonomous and connected driving and is funded by the Federal Ministry for Economic Affairs and Climate Action.

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