**Bird's-Eye View Map Layout Generation and Speed Estimation with Yolo Library**

Besim Söğüt

Yildiz Technical University

**Abstract.** In this study, using perspective view bird’s eye view and object detection is generated. And also, with Yolo library, speed estimation of the car is estimated according to the objects’ speed.

**Keywords:** image processing, perspective, detection.

1. **Selected Paper**
   1. **Explanation**

In the selected paper, it is introduced MapPrior, a novel BEV perception framework that combines a traditional discriminative BEV perception model with a learned generative model for semantic map layouts. MapPrior delivers predictions with better accuracy, realism, and uncertainty awareness. It is evaluated the model on the large-scale nuScenes benchmark. At the time of submission, MapPrior outperforms the strongest competing method, with significantly improved MMD and ECE scores in camera- and LiDAR-based BEV perception. Furthermore, our method can be used to perpetually generate layouts with unconditional sampling.

metin, çizgi, ekran görüntüsü içeren bir resim

Açıklama otomatik olarak oluşturuldu

Fig. 1. Compariston of Sensor Datas

diyagram, metin, ekran görüntüsü, tasarım içeren bir resim

Açıklama otomatik olarak oluşturuldu

Fig 2. MapPrior Process

According to Fig 2, Lidar datas and camera images are received. The objective of this research is to develop a method that can generate a precise, realistic, and uncertainty-aware map layout from sensory input in one or a few modalities. To achieve this, we introduce a new framework named MapPrior that combines the predictive capability of discriminative models with the capacity of generative models to capture structures and uncertainties. We present a two-stage conditional sampling framework to explain our approach and detail the implementation of each module. Additionally, we discuss our design decisions, the learning process, and how our approach relates to previous methods.

* 1. **Learning Process**

The training process consists of three individual components. Firstly, the perception module, denoted as F, is learned to produce a reliable initial layout estimation. Secondly, the encoder, decoder, and codebook (denoted as E, G, and C, respectively) are jointly trained to represent a strong map prior model. Lastly, given a fixed map prior model, the conditional sampling transformer T is learned to sample high-quality final results. In the following, we will provide a

detailed description of each component’s training procedure.

* 1. **Conclusion of the Selected Paper**

This paper presents MapPrior, a novel generative method for performing BEV perception. The core idea is to leverage a learned generative prior over traffic layouts to provide diverse and accurate layout estimations, which potentially enable more informed decision-making and motion planning. Our experiments show that our approach produces more realistic scene layouts, enhances accuracy, and better calibrates uncertainty compared to current methods.

1. **Developed Project**
   1. **Explanation**

Our project is aimed to generate perspective view with the images from the cameras, detect objects with these images and estimate speed using Yolo library.

According to the selected paper, this project will be more simple and added different features.

diyagram, çizgi, ekran görüntüsü, meneviş mavisi içeren bir resim

Açıklama otomatik olarak oluşturuldu

Fig. 3. 2D to BEV

yol, karayolu, dış mekan, yol, yöntem, sahne içeren bir resim

Açıklama otomatik olarak oluşturuldu

Fig. 4. Vehicle Speed Estimation with Yolo Library

**References**

1. Zhu, Xiyue and Zyrianov, Vlas and Liu, Zhijian and Wang, Shenlong, MapPrior: Bird's-Eye View Map Layout Estimation with Generative Models, Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 8228-8239
2. Simple-BEV: What Really Matters for Multi-Sensor BEV Perception, Adam W. Harley and Zhaoyuan Fang and Jie Li and Rares Ambrus and Katerina FragkiadakiLNCS Homepage, <http://www.springer.com/lncs>, last accessed 2023/10/25