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Peer Review

Review of: "OpenAD: Open-World Autonomous Driving Benchmark for 3D Object Detection"

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Strengths

Novel Contribution: The introduction of OpenAD as the first real-world benchmark for open-world 3D object detection is a significant advancement in autonomous driving research. The dataset's inclusion of 206 object categories and 2,000 diverse scenarios makes it highly relevant for evaluating both open-world perception and domain generalization capabilities.

Clear Motivation: The paper identifies critical challenges in 3D open-world object detection, including the scarcity of benchmarks, limited dataset scales, and low precision of existing models. It proposes practical solutions, such as leveraging multimodal large language models (MLLMs) for corner case annotation and introducing ensemble approaches.

Baseline and Fusion Approach: The proposed vision-centric 3D detection baseline and fusion methodology effectively address the limitations of open-world and specialized models. This hybrid approach leverages the generalization capabilities of open-world models and the precision of specialized models, yielding robust performance.

Thorough Evaluation: The experiments provide comprehensive evaluations across multiple dimensions, including domain generalization, open-vocabulary capabilities, and performance on seen and unseen categories. The results underscore the utility of OpenAD as a benchmarking tool.

Areas for Improvement

Logical Flow:

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- The **logical flow between paragraphs** is often disjointed, making it challenging to connect the various components of the paper. For instance, the description of challenges in open-world perception could transition more smoothly into the introduction of OpenAD.

Focus on Dataset Characteristics:

- For a dataset paper, greater emphasis should be placed on the **unique features of OpenAD**, such as the diversity of annotated objects, the real-world data collection process, and the integration of MLLM for annotation. Detailed comparisons with existing datasets like CODA, nuScenes, and KITTI should be expanded to clearly highlight OpenAD's contributions.
- The **experimental section**, while valuable, should primarily serve to showcase the dataset's utility rather than emphasize the performance of specific models.

Recommendations for Revision

Code Accessibility:

- Detail how the community can leverage the OpenAD toolkit and evaluation metrics. If possible, provide initial results or case studies using the dataset.

Additional Context:

- Provide more insights into the challenges of annotating open-world datasets and how the proposed MLLM-based pipeline addresses these challenges.

Declarations

Potential competing interests: No potential competing interests to declare.