Dear editor:

We are submitting the enclosed manuscript entitled “Probabilistic Refinement for RoI-based Monocular 3D Object Detection” for your consideration as an article in Applied Intelligence. The work described has not been submitted elsewhere for publication, in whole or in part, and all authors have contributed to, read and approved the manuscript that is enclosed.

Monocular 3D object detection has garnered significant attention due to its cost-effectiveness and simplified setup. In this study, we delve into Region of Interest (RoI)-based monocular detectors. Previous approaches treat all parts of the RoI equally. However, different regions within the RoI hold varying importance, and accurate RoI estimation may be hindered by occlusions or long distances. Thus, we introduce the Multi-Scale Grid Attention (MSGA) mechanism to investigate multi-scale RoI exploration and the significance of RoI regions. Moreover, while existing methods treat depth estimation as a probability estimation during training, they do not effectively utilize probabilistic properties during inference. To tackle these issues, we propose a novel probabilistic post-processing method to enhance detection robustness. Experimental evaluations are conducted on the KITTI and Waymo datasets, achieving state-of-the-art performance.

We deeply appreciate your consideration of our manuscript, and we look forward to receiving comments from the reviewers. Correspondence should be directed to Tingyu Zhang at the following address:

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Thanks very much for your attention to our paper.

Sincerely,

Tingyu Zhang