Yolo+FPN: 2D and 3D Fused Object Detection
With an RGB-D Camera

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We propose a new deep neural network system, called Yolo+FPN, which fuses both 2D and 3D object detection algorithms. It achieves better real-time object detection results and faster inference speed, to be used on real robots. In order to satisfy real-time requirements, a trade-off between accuracy and efficiency is needed. We have improved training and test accuracies and lower mean losses on the KITTI object detection benchmark. And, we have competitive average precision on 3D detection of all classes in three levels of difficulty compared to other state-of-the-art methods.

Also, we implemented Yolo+FPN using an RGB-D camera, and compared the speed of object detection using different GPUs. For the real implementation we focus on person detection, which is the most challenging and important among the three classes.

**Qualitative Results**

(a) 2D visualization (global)  (b) 3D visualization (global)

(c) 2D visualization (local)  (d) 3D visualization (local)

**Quantitative Results**

(a) 3D box detection loss  (b) 3D box detection accuracy  (c) 3D instance segmentation accuracy

**References**

