
Learning Generalized Intersection Over Union for Dense Pixelwise Prediction

Supplementary Material

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A. Pseudo code of PixIoU

Explicitly, we provide the pseudo code for computing PixIoU and Lovász PixIoU as following.

Algorithm 1 Pseudo code on the computation of PixIoU

input \tilde{y} the groundtruth, y the prediction, C the set of labels.

```
1: for  $c \in C$  do
2:    $m = |\tilde{y} == c|$ ;
3:    $n = (\tilde{y} == c) \ \&\ (y! = c)$ ;
4:    $p = (\tilde{y}! = c) \ \&\ (y == c)$ ;
5:    $iou_c = \frac{m - sum(n)}{m + sum(p)}$ 
6:    $d_n = distanceFunction(y, c)$ 
7:    $d_p = distanceFunction(\tilde{y}, c)$ 
8:    $pixiou_c = \frac{m - \langle d_n, n \rangle}{m + \langle d_p, p \rangle} + iou_c - 1$ 
9: end for
10: return  $pixiou = \frac{1}{|C|} \sum_{c \in C} pixiou_c$ 
```

B. Qualitative results

In this section, we show more qualitative results of the experiments in Figure 1, Figure 2 and Figure 3

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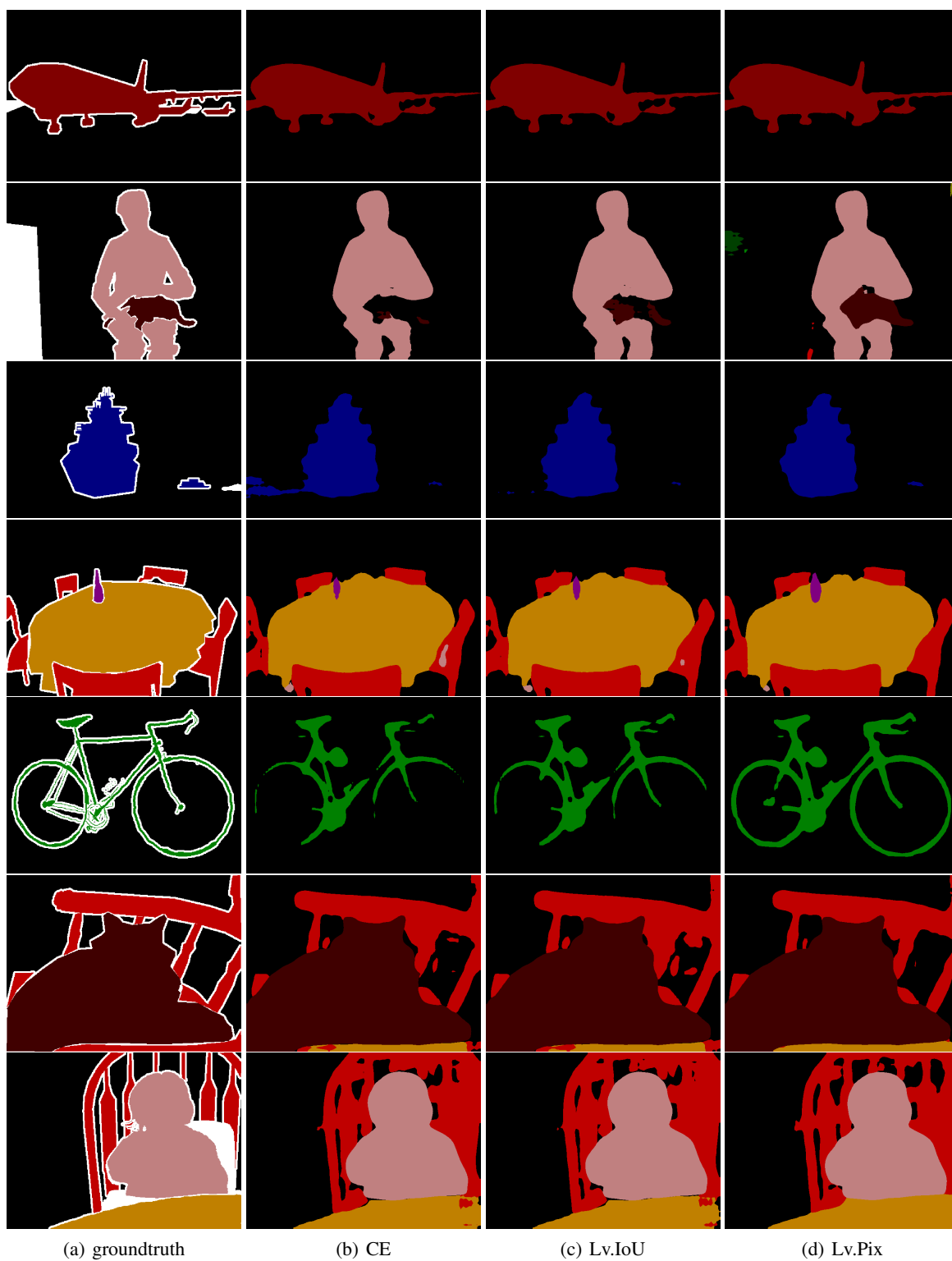
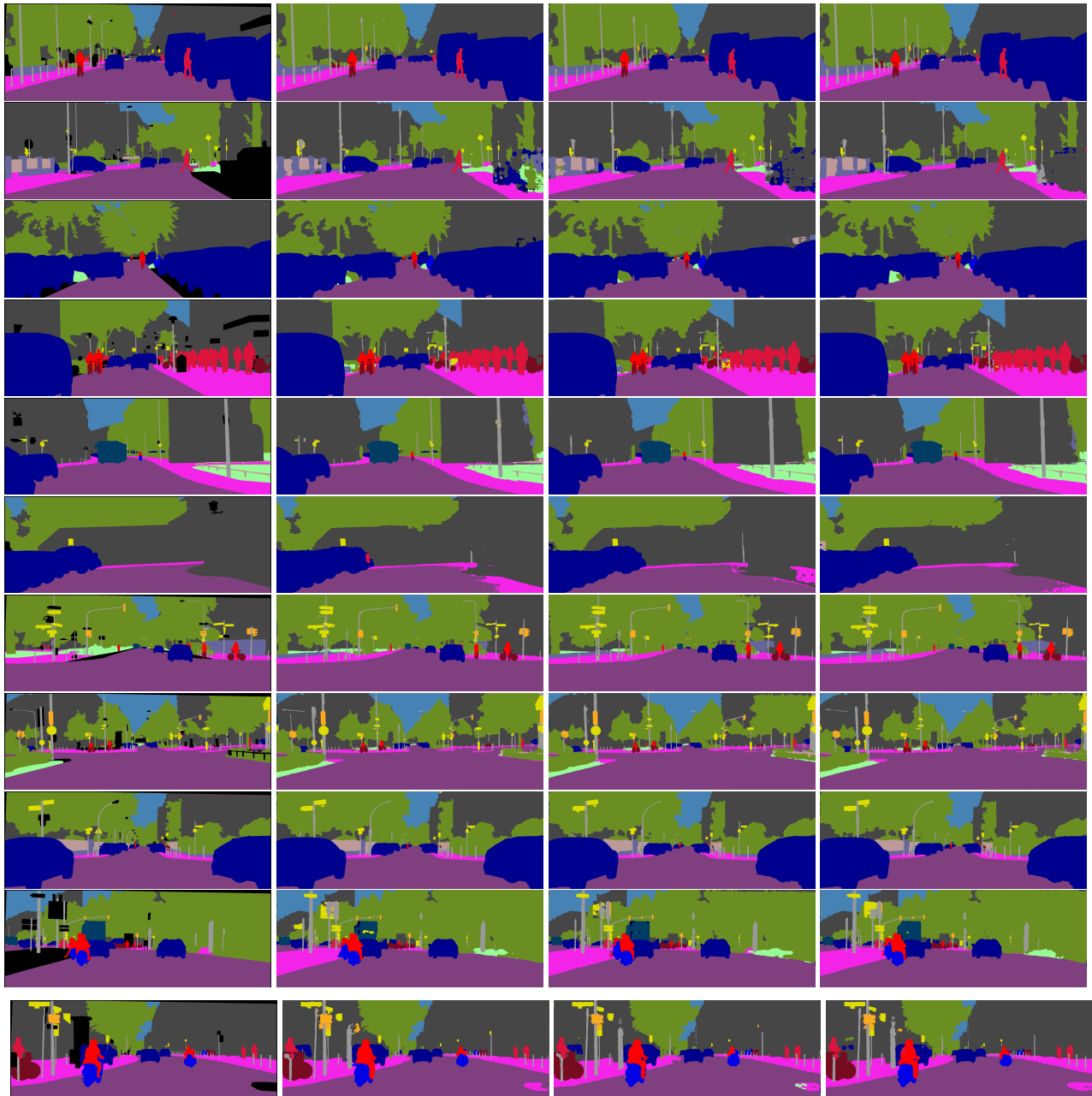


Figure 1: Qualitative results on Pascal VOC 2012 of the model Deeplabv3-resnet101.



(a) groundtruth

(b) WCE

(c) Lv.IoU

(d) Lv.PixIoU

Figure 2: Qualitative results on Cityscapes of the Deeplabv3+ models trained with different loss functions.

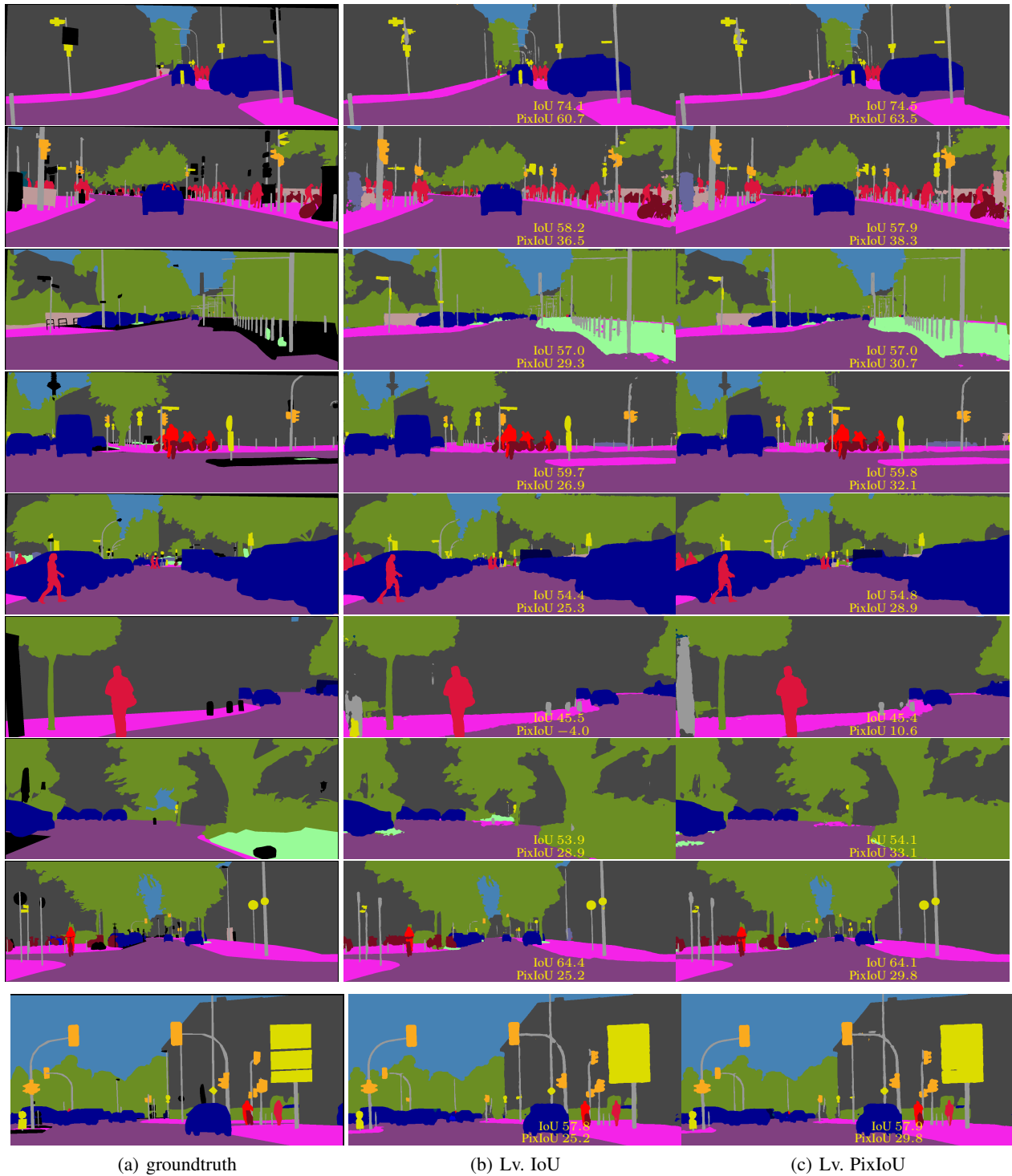


Figure 3: Examples of the cases that PixIoU provides larger gradients than those of IoU, and the predictions with larger PixIoU provides better qualitative results.