Multimodal Amodal Instance Segmentation

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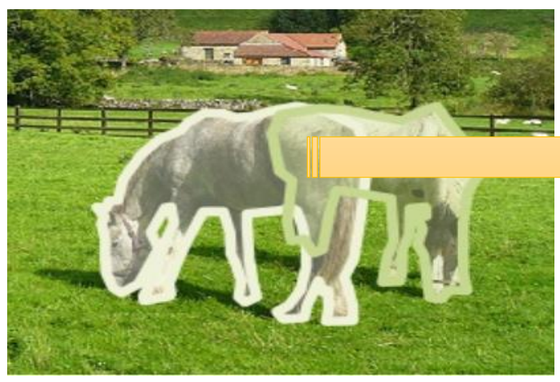
Definition

(a) Instance Segmentation



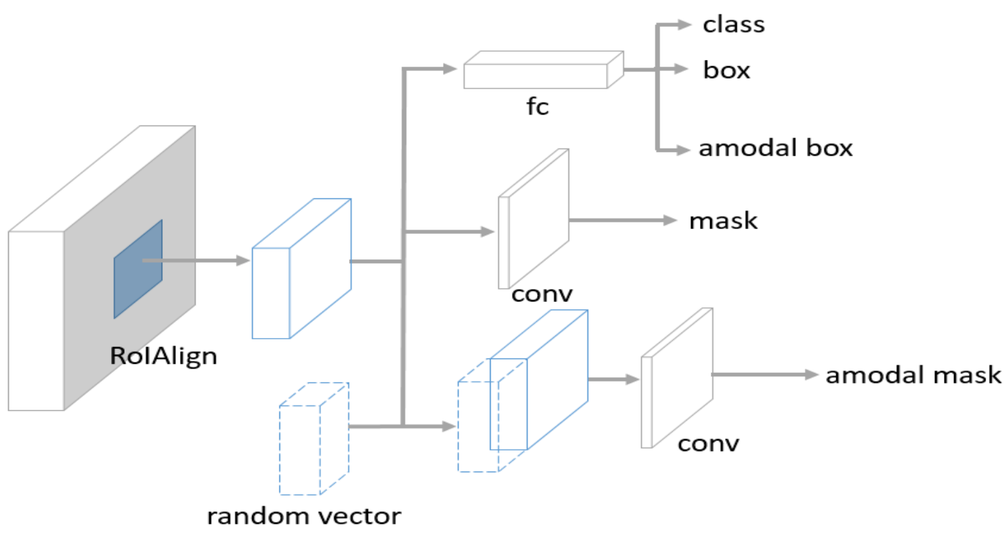
(b) Amodal Instance Segmentation

Only one possibility?

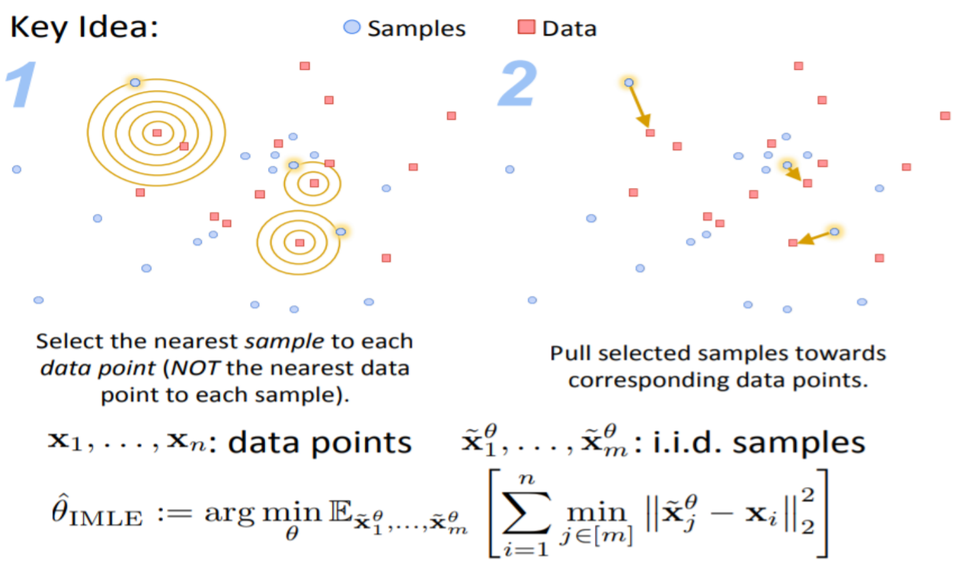
(c) Multimodal Amodal Instance Segmentation

- **Instance Segmentation:** predicting mask of (visible part of) each object instance
- **Amodal Instance Segmentation**:[1,2] predicting not only mask of visible part of object, but also that of invisible part
- **Multimodal Amodal Instance Segmentation:** predicting all possible amodal instance segmentations

Method



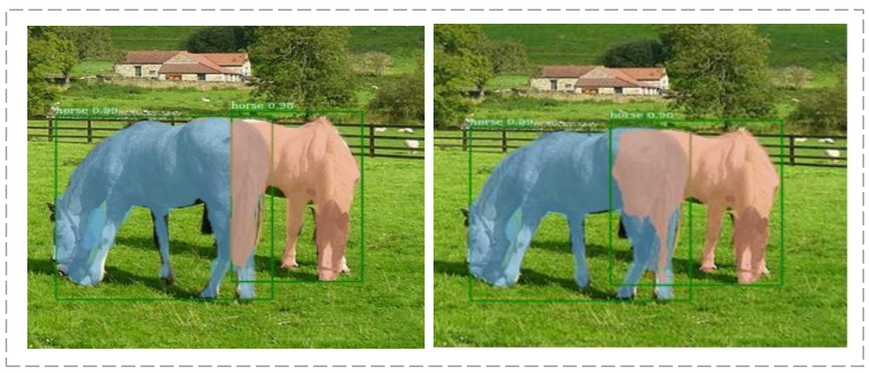
- Our model is based on Mask R-CNN[3]. We extend a new branch to predict amodal instance mask, whose input is RoIAlign feature and random vector.
- We apply IMLE[4] to **train the model to make random vector represent information about invisible part.**



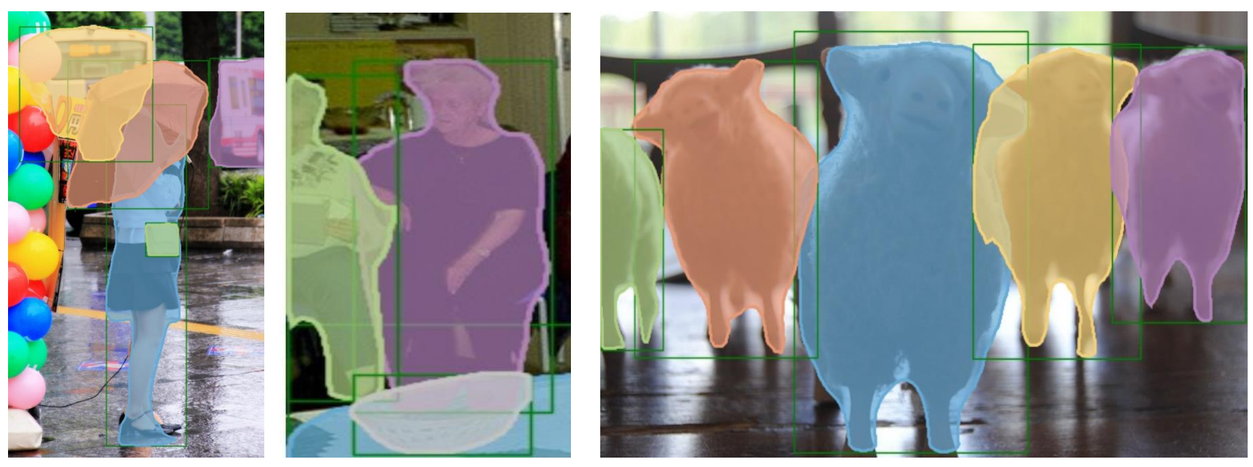
- Key idea of IMLE[4] is making sure each data point(training example) has corresponding sample(random vector) so that to avoid Mode Collapse.

Result

(a) Mask R-CNN



(b) Our result



(c) More examples

- Our model basically achieves to output multimodal amodal instance segmentation. **Future work is towards to be more realistic and smooth.**

Reference

[1] Ke Li and Jitendra Malik. Amodal Instance Segmentation. 2016. In ECCV.
[2] Yan Zhu, Yuandong Tian, Dimitris Mexatas, and Piotr Doll ár. Semantic Amodal Segmentation. 2017. In CVPR.
[3] Kaiming He, Georgia Gkioxari, Piotr Doll ár, and Ross Girshick. Mask R-CNN.2017. In ICCV.
[4] Ke Li and Jitendra Malik. Implicit Maximum Likelihood Estimation. 2018. arXiv:1809.09087.