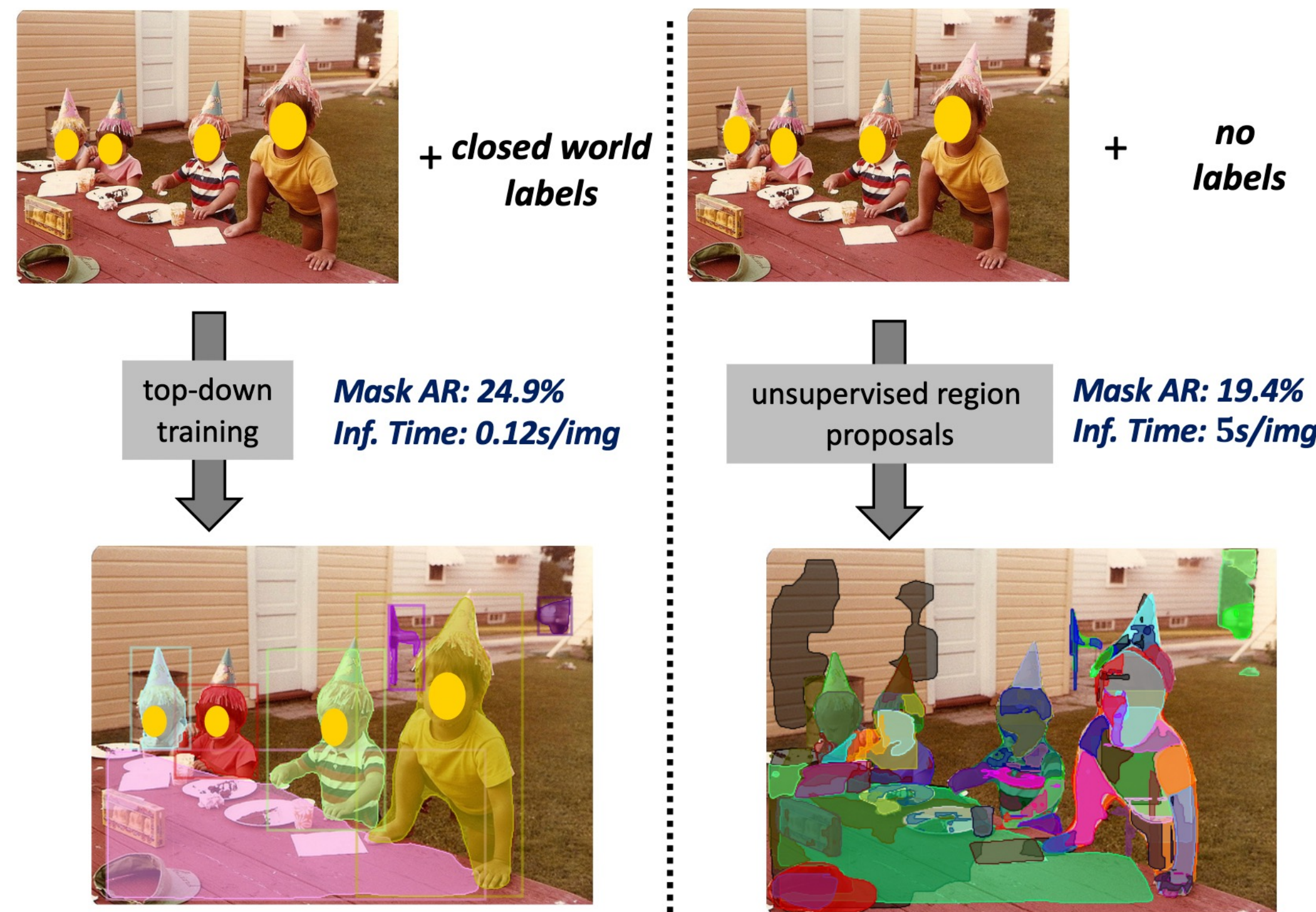
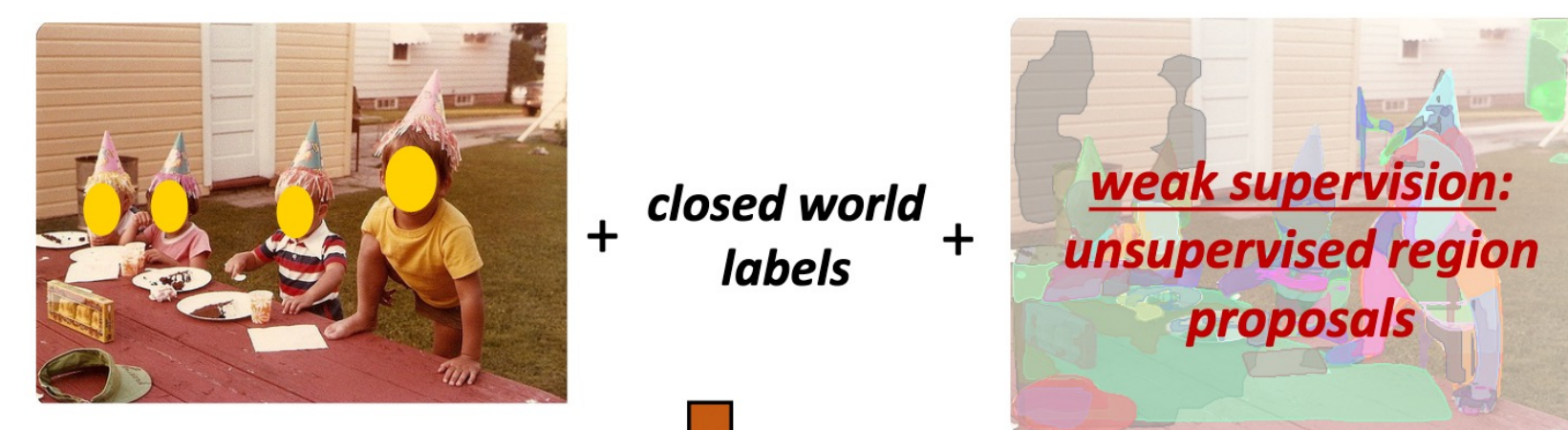


## UDOS segments unannotated objects ....

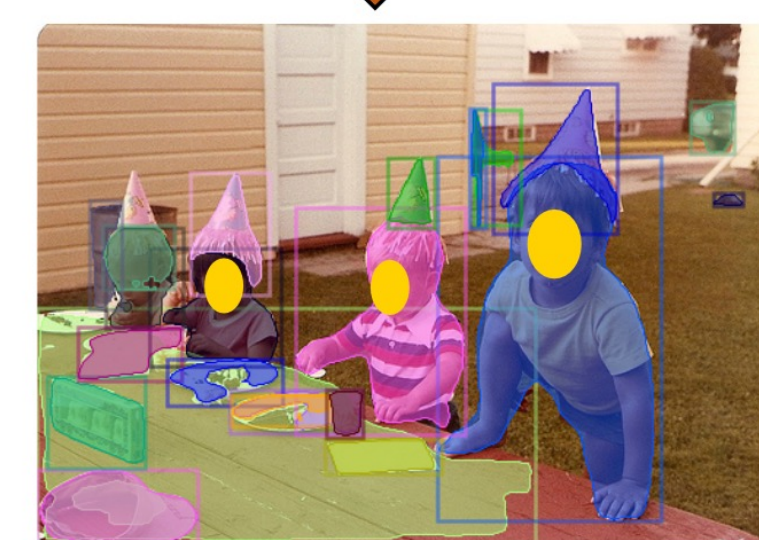


7 detections (missed unlabeled classes like hat, plate, paper)  
(a) Mask RCNN

107 detections (many false positives)  
(b) MCG

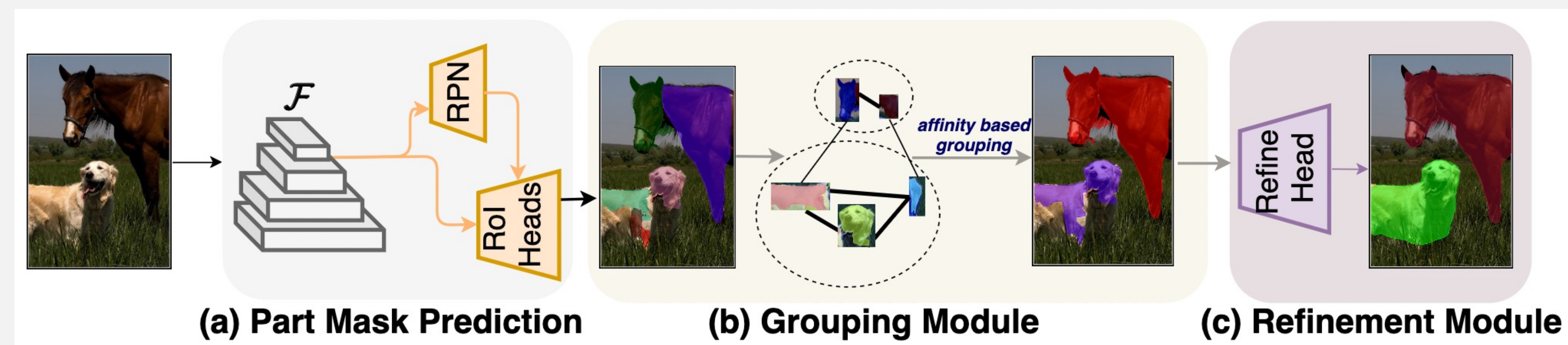


UDOS (Ours): bottom-up grouping + top-down training  
Mask AR: 31.6%  
Inf. Time: 0.13s/img

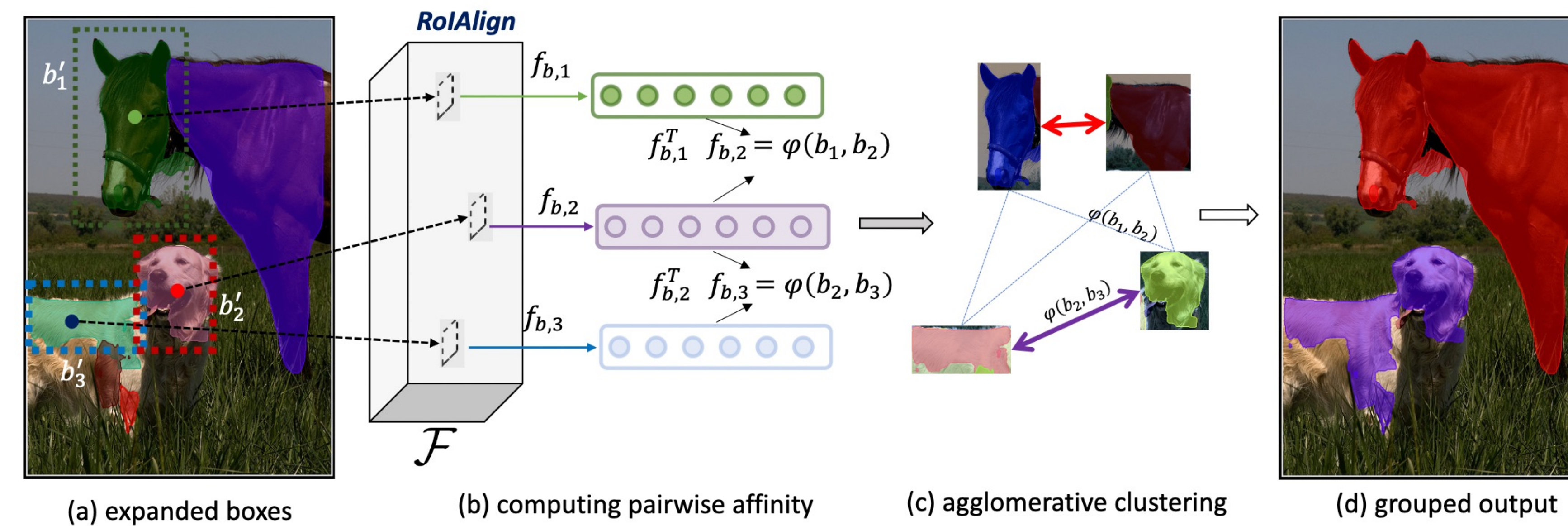


22 detections (successfully detected unlabeled categories like hat, plate, paper)  
(c) UDOS (Ours)

*TLDR: Open-world instance segmentation by leveraging weak-supervision from bottom-up grouping algorithms like selective search within top-down architectures.*



## ... by clustering supervision from bottom-up mask proposals ....



### Clustering Objective

$$\max_G \sum_{k=1}^{|G|} \sum_{p_i, p_j \in g_k} \phi(p_i, p_j), \quad \text{s.t.} \quad \sum_{k=1}^{|G|} |g_k| = n_p \quad \phi(p_i, p_j) = \frac{f_{b_i, i}^T \cdot f_{b_j, j}}{\|f_{b_i, i}\| \|f_{b_j, j}\|}; f_{b_i, i} = \text{RoIAlign}(\mathcal{F}, b'_i)$$

## ... outperforming several prior approaches!

