

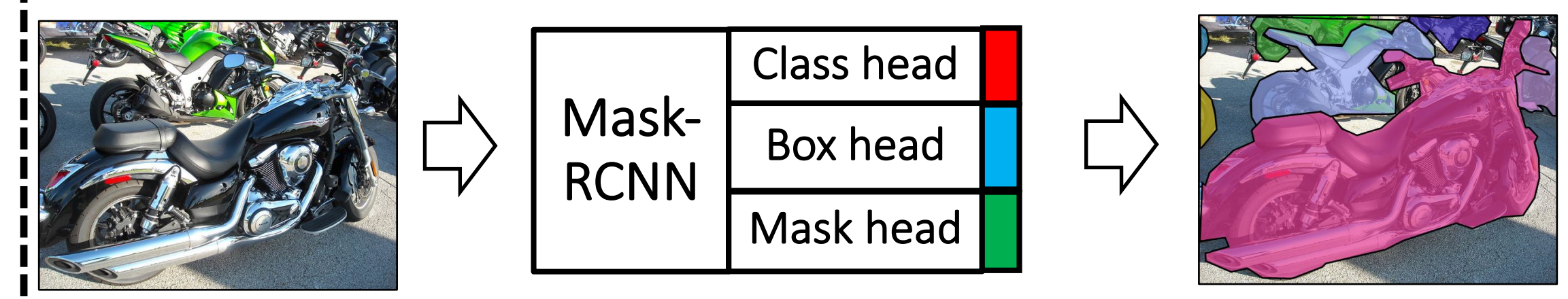


Introduction

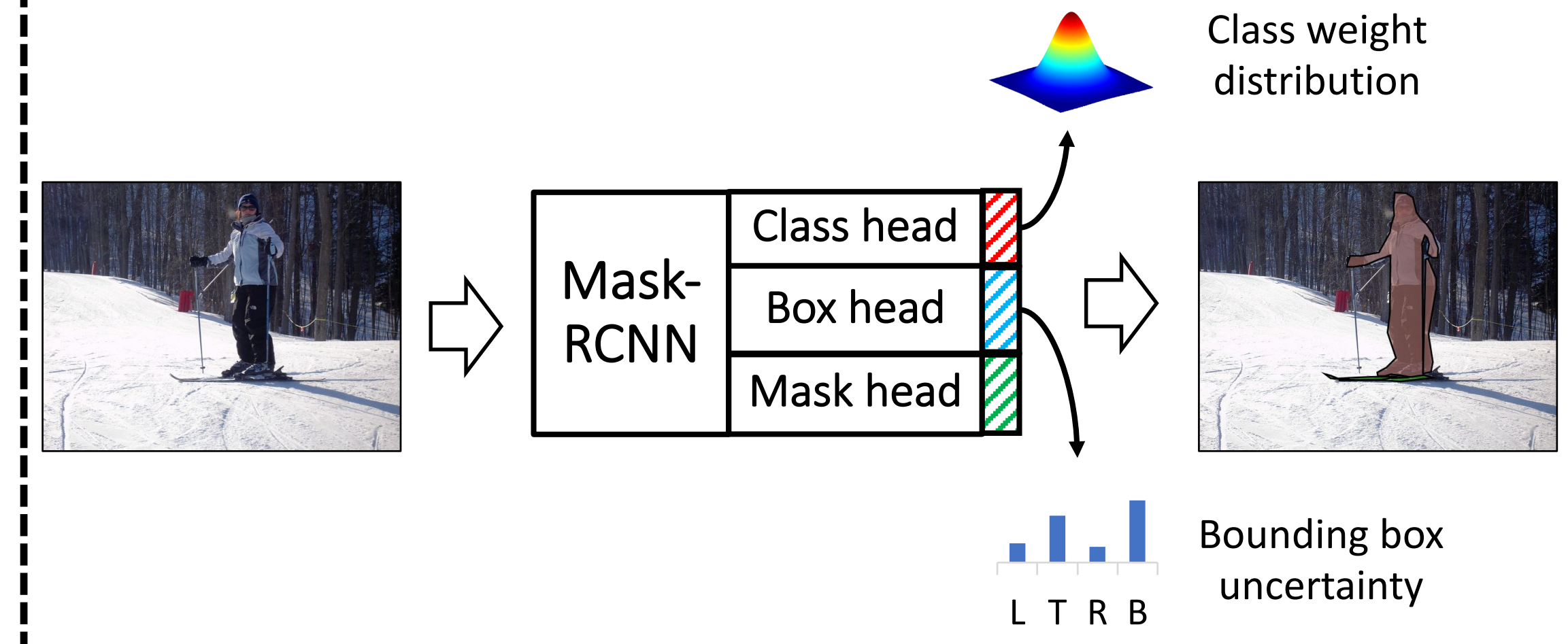
- Problem statement:** In training, a large training set of base classes (i.e., images + instance mask annotations) is provided. In testing, given a **few** annotated examples of new classes **without the access to the training examples** of the base classes, our goal is to segment **both** new and base classes
- Key challenges:** how to address a paucity of data for new classes, and how to train on the new classes such that the base classes are not “forgotten”
- Applications** where access to the old training data becomes unavailable due to, e.g., privacy and security issues or new legal regulations of data access; or limited time budgets prohibit retraining on both base and new classes.

Training

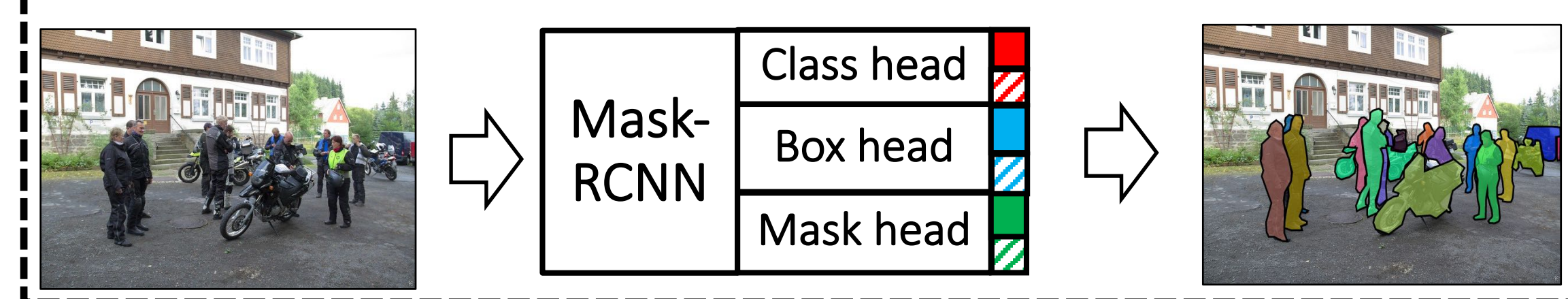
Pre-training on the base classes



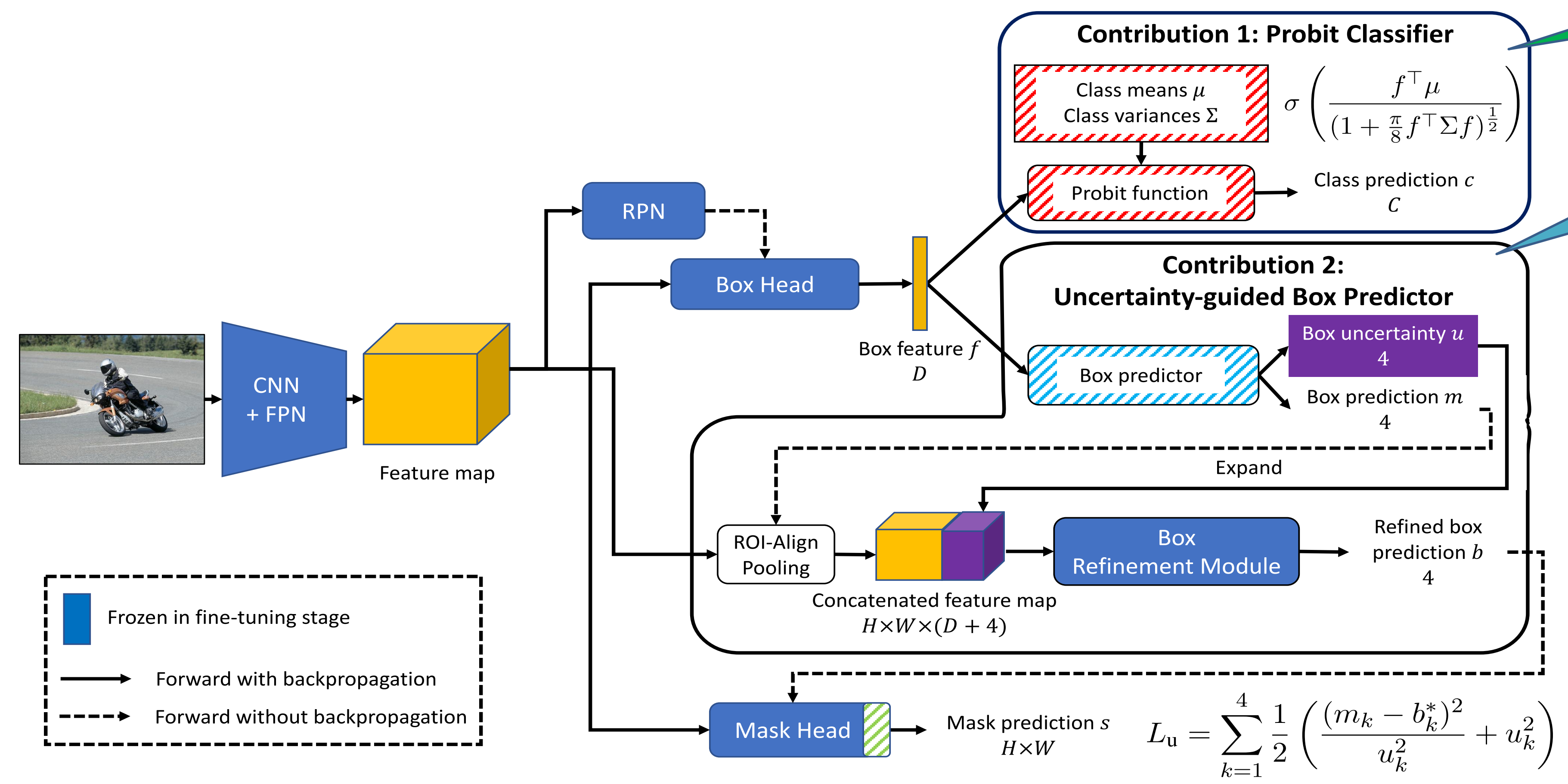
Fine-tuning on the new classes



Testing on the base and new classes



Our Approach



Probit classifier based on Bayesian Learning to learn distribution of weights instead of a point estimate

Uncertainty-guided box predictor estimates the uncertainty of predicting object bounding box to regularize the training with a few examples and refine the initial box prediction

Qualitative Results

Figure 1. Bounding-box refinement. Left: initial, Right: refined



Quantitative Results

Table 1. Ablation Study with FSIS

	Contrib. 1	Contrib. 2	1	2	3	5	10	30
Mask-RCNN	X	X	3.71	5.24	5.29	7.66	8.46	11.09
Mask+Sigmoid	X	X	3.92	4.63	5.63	7.15	7.67	10.94
iFS-RCNN	✓	✓	5.15	6.03	7.67	9.34	9.52	12.07
	X	✓	4.84	5.88	7.00	8.62	9.22	11.98
iFS-RCNN	✓	✓	5.54	6.33	7.80	9.41	10.23	13.08

Figure 2. Qualitative results on COCO



Figure 3. Comparison to SOTA with iFSIS

