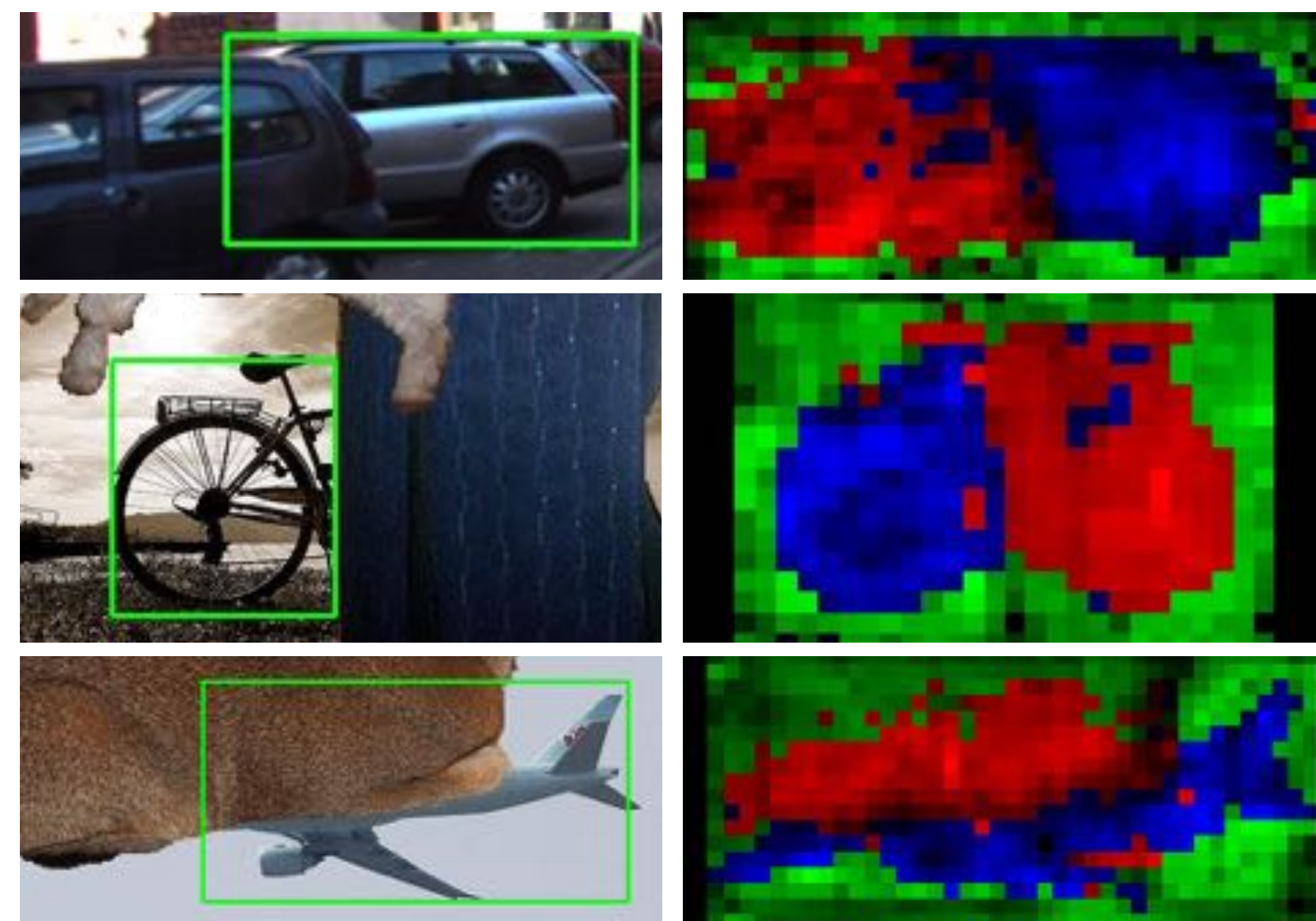


Amodal Segmentation through Out-of-Task and Out-of-Distribution Generalization with a Bayesian Model

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Introduction

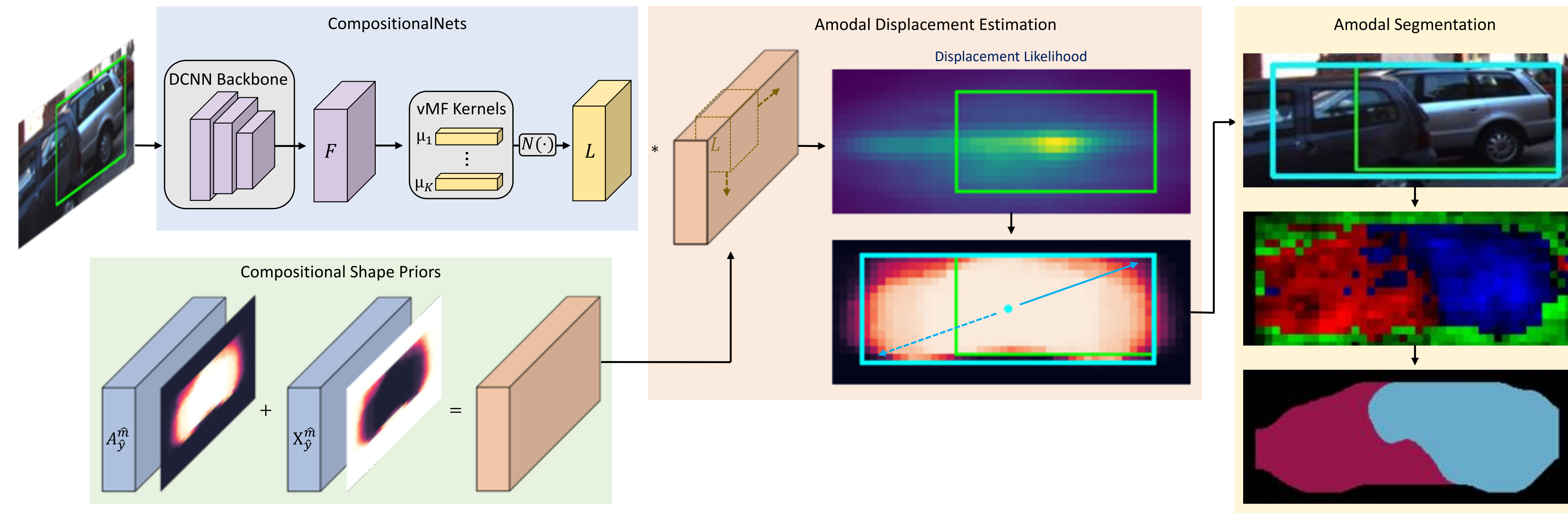
- Amodal completion is a visual task that segment those object boundaries which are occluded and hence invisible.
- The task is particularly challenging for deep neural networks since data is difficult to obtain and annotate.



Contributions

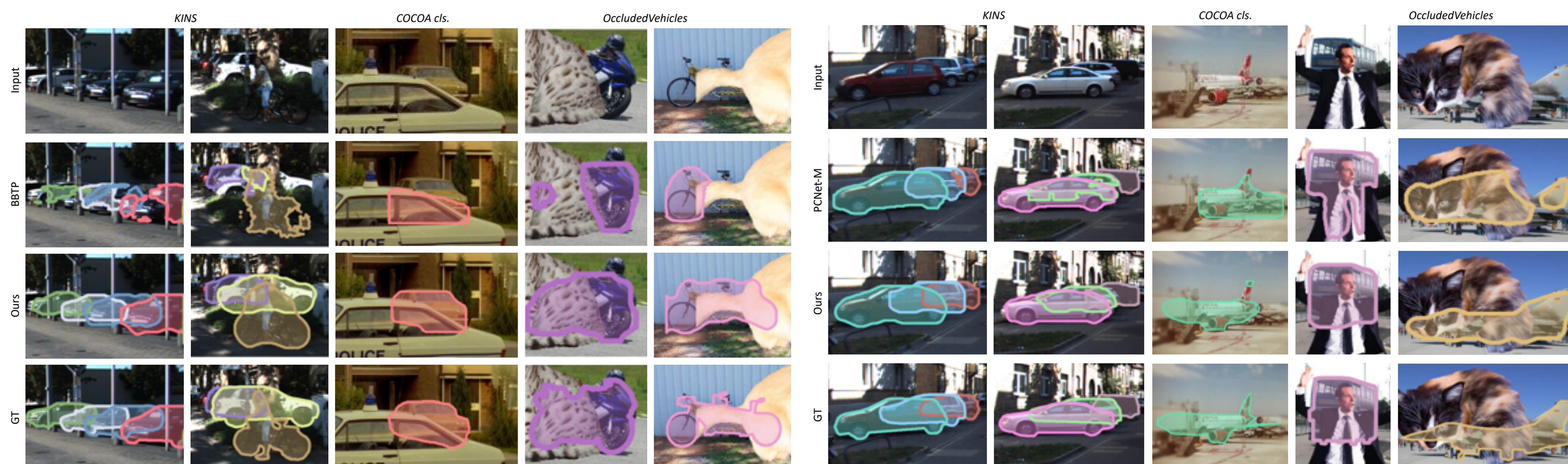
- We formulate amodal instance segmentation as an out-of-task and out-of-distribution generalization problem with a Bayesian generative model.
- Our Bayesian model is learned from unoccluded objects with bounding box and class labels only.
- To the best of our knowledge, our model is first to generalize to previously unseen occluders for amodal segmentation.

Methods



- Model Pipeline. Input image and the proposed region is given as input for amodal segmentation,

Results



- Qualitative Results are shown with known (left) and unknown (right) object center.

Conclusions

Amodal Segmentation on KINS							
Methods	k. c	superv.	FG-0	FG-1	FG-2	FG-3	Mean
PCNet-M	✗	mask	75.3	65.5	52.9	33.5	56.8
Ours-ML	✗	box	69.2	68.7	62.7	45.2	61.5
Ours-E2E	✗	box	69.9	68.1	63.2	47.3	62.1
BBTP	✓	box	77	68.3	58.9	53.9	64.5
Ours-ML	✓	box	71.8	70.1	66.2	57.8	66.5
Ours-E2E	✓	box	72.3	69.6	66.2	58.5	66.7

Amodal Segmentation on COCOA cls.							
Methods	k. c	superv.	FG-0	FG-1	FG-2	FG-3	Mean
PCNet-M	✗	mask	56.8	53.6	47	38.4	49
Ours-ML	✗	box	61.1	62	60	54.3	59.4
Ours-E2E	✗	box	58.3	59.8	58.6	53.5	57.6
BBTP	✓	box	57.3	49.4	40.7	35	45.6
Ours-ML	✓	box	65	64.2	64.2	60.9	63.6
Ours-E2E	✓	box	65.3	65	64.3	61.4	64

- Amodal segmentation is evaluated on KINS and COCOA cls. where meanIoU is used as evaluation metric
- Our model outperforms alternative weakly-supervised methods (BBTP) by a large margin and even outperforms supervised methods (PCNet-M) when the amount of occlusion is large.

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