

Semantic Curiosity for Active Visual Learning

ECCV-2020

Webpage: <https://devendrachaplot.github.io/projects/SemanticCuriosity>



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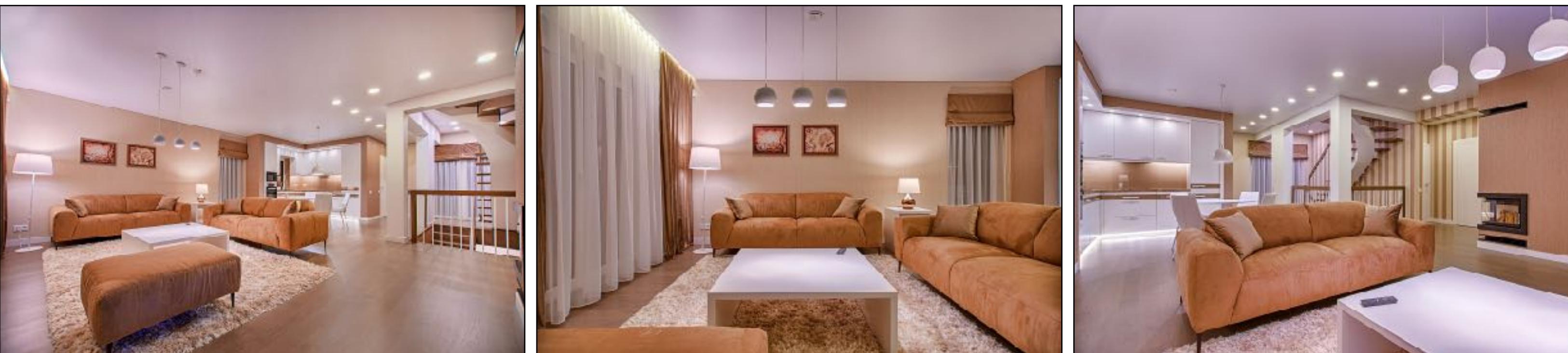


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Active Visual Learning



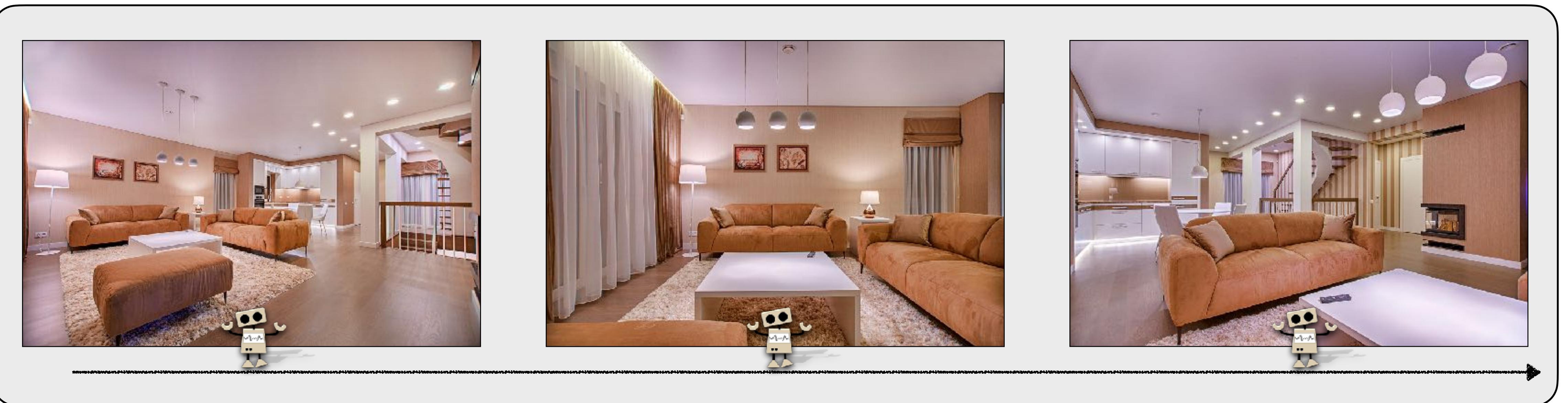
- *Static Datasets*
- *Great for benchmarking*
- *Long-tail problem*



- *Active Visual Learning*
- *Personalization*
- *Learn to gather data*

Active Visual Learning

Given a pre-trained object detection/segmentation model, learn a **self-supervised exploration policy** to gather observations to improve the model

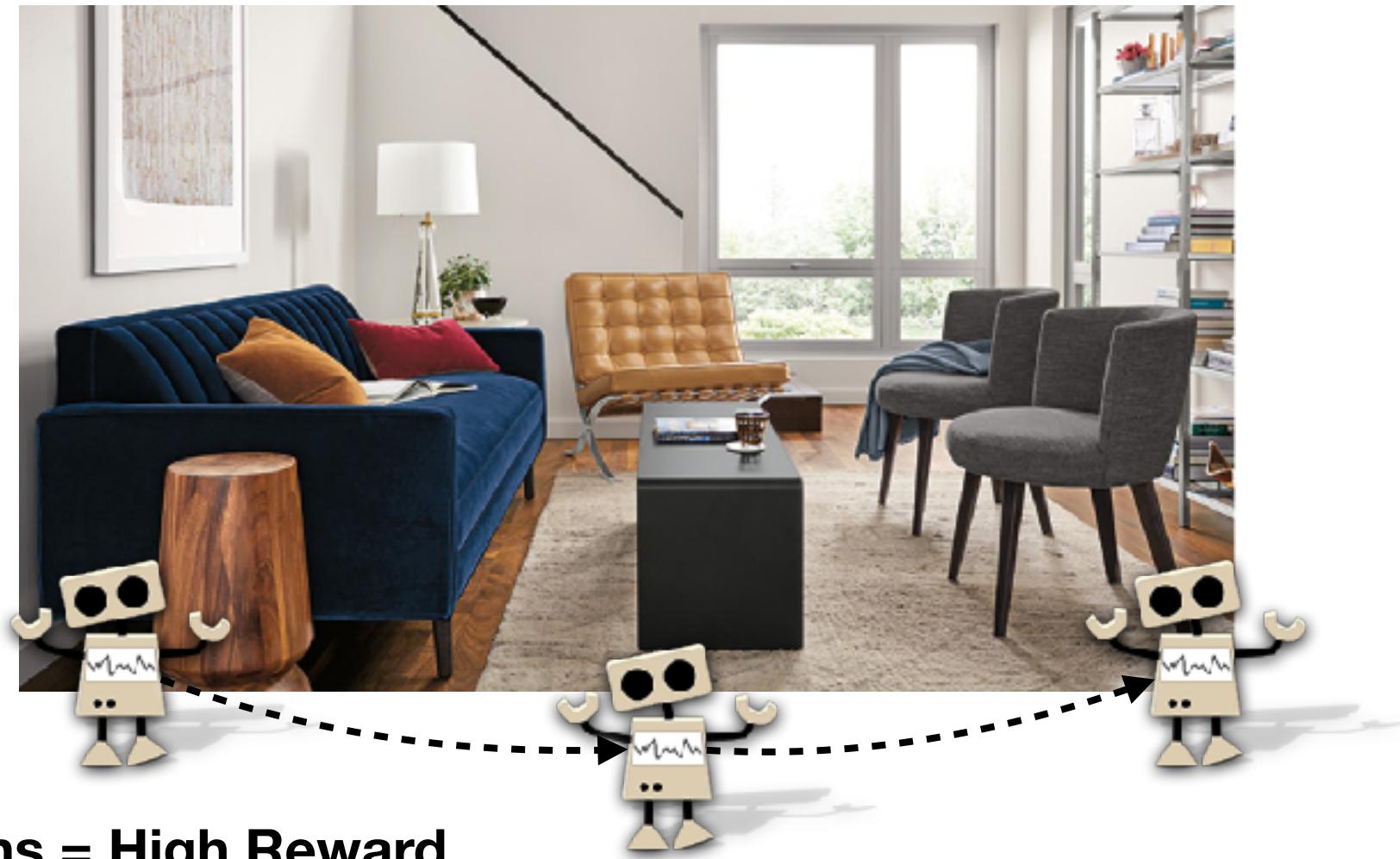


Active Visual Learning

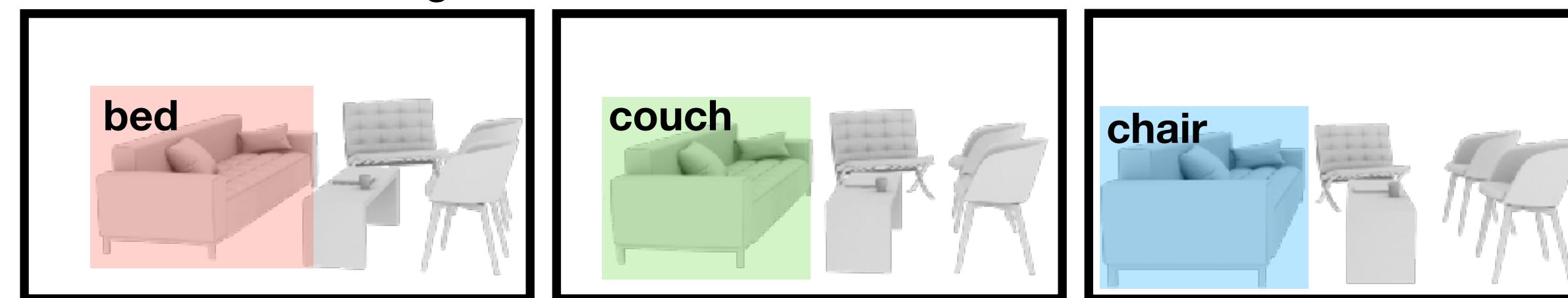
Given a pre-trained object detection/segmentation model, learn a **self-supervised exploration policy** to gather observations to improve the model

- *Generates observations of objects not walls and ceilings.*
- *Observe many unique objects.*
- *Observe images with incorrect object detections.*

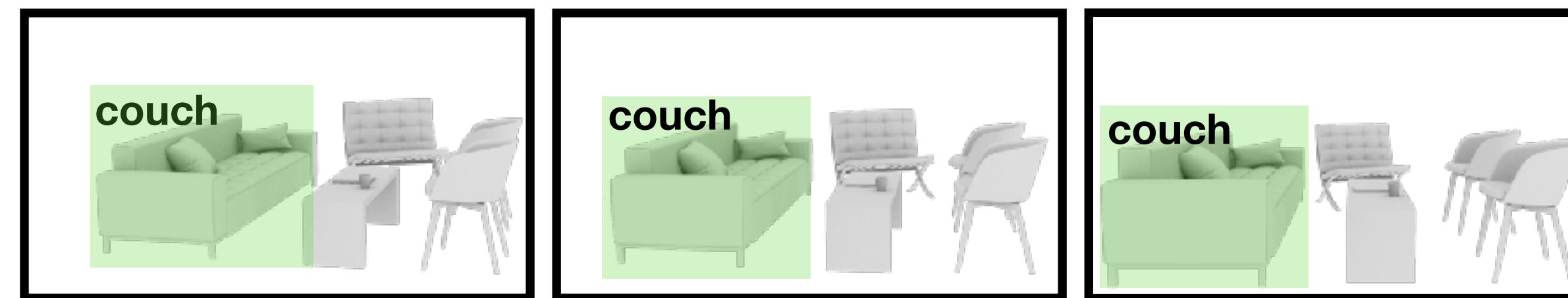
Semantic Curiosity



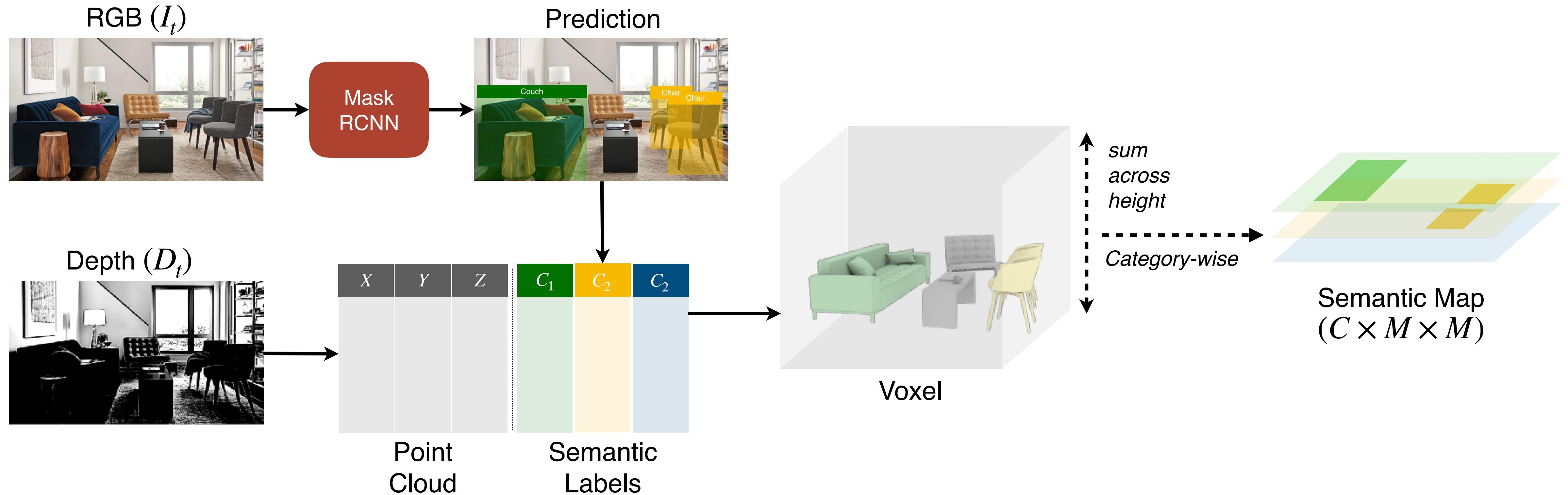
Inconsistent Detections = High Reward



Consistent Detections = Low Reward



Semantic Mapping

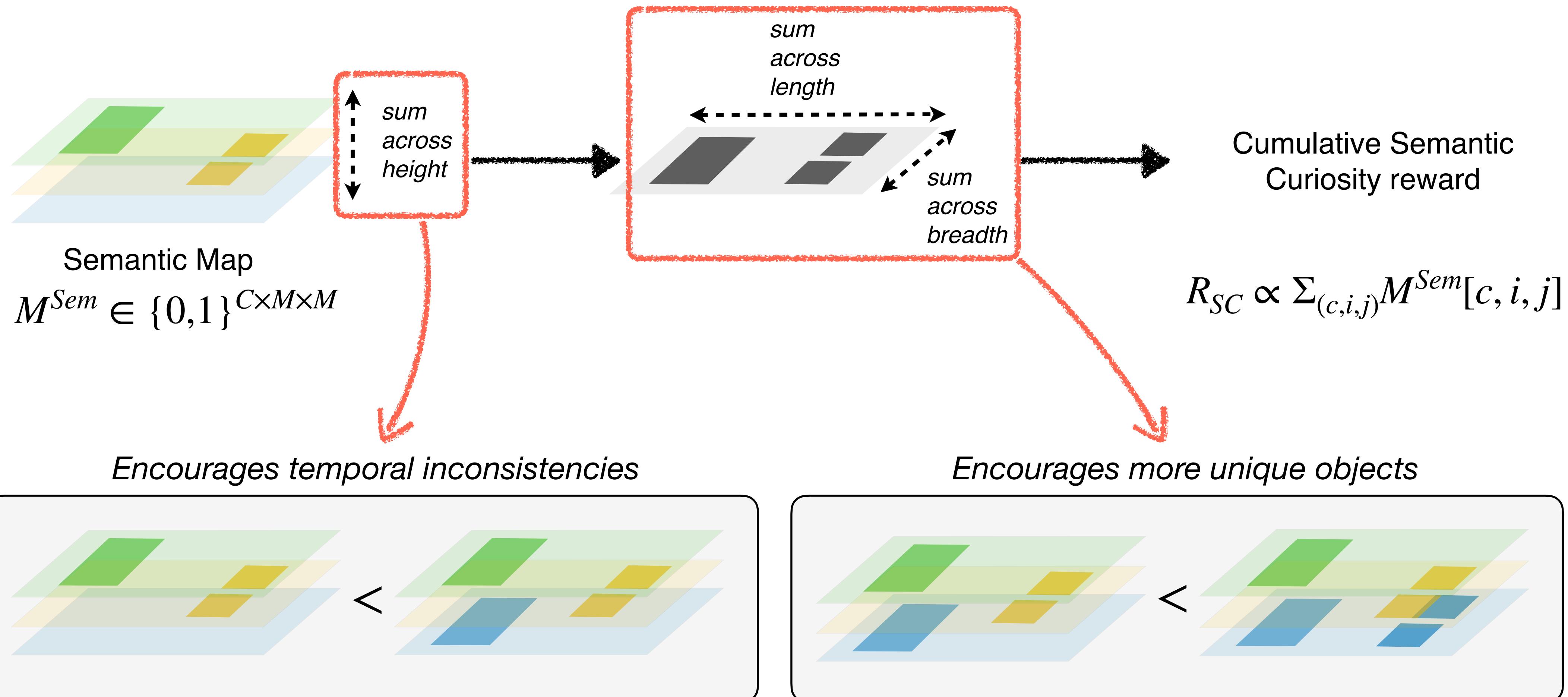


Semantic Mapping

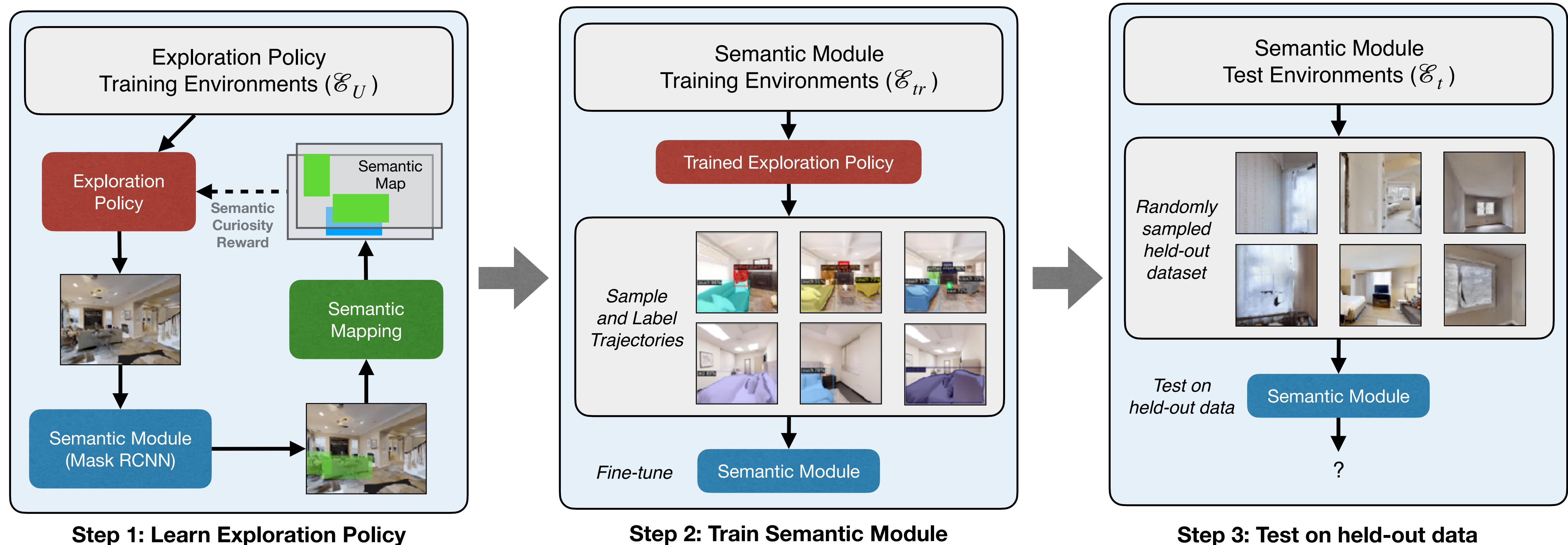
Time



Semantic Curiosity

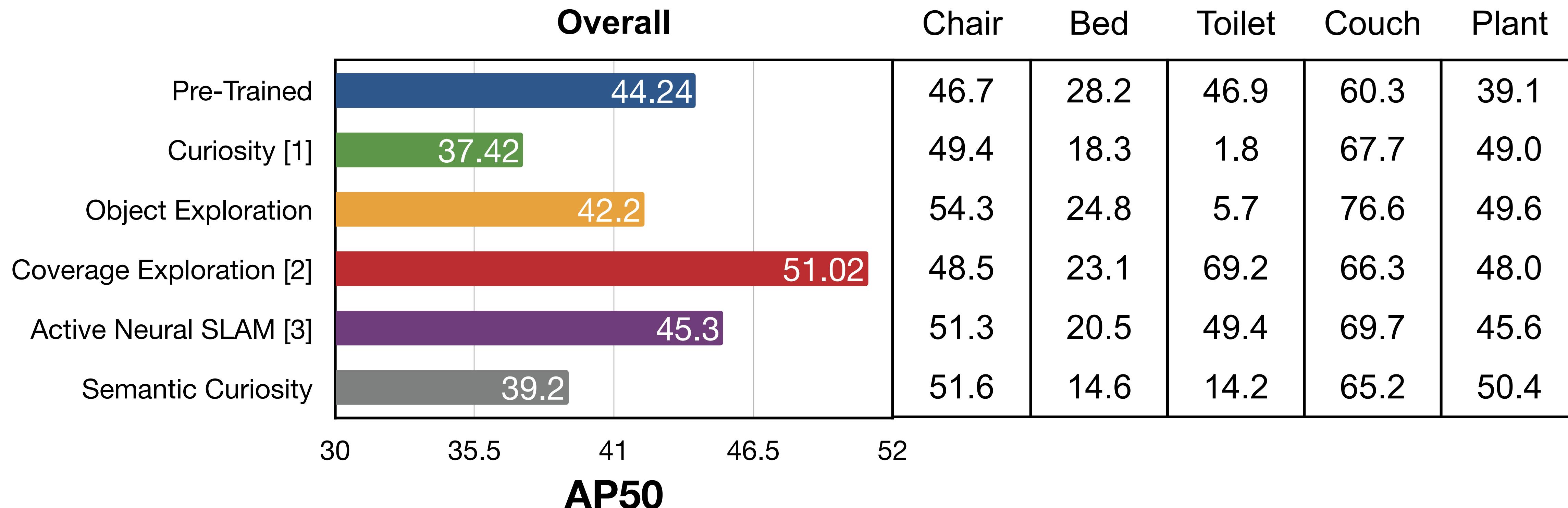


Method Overview



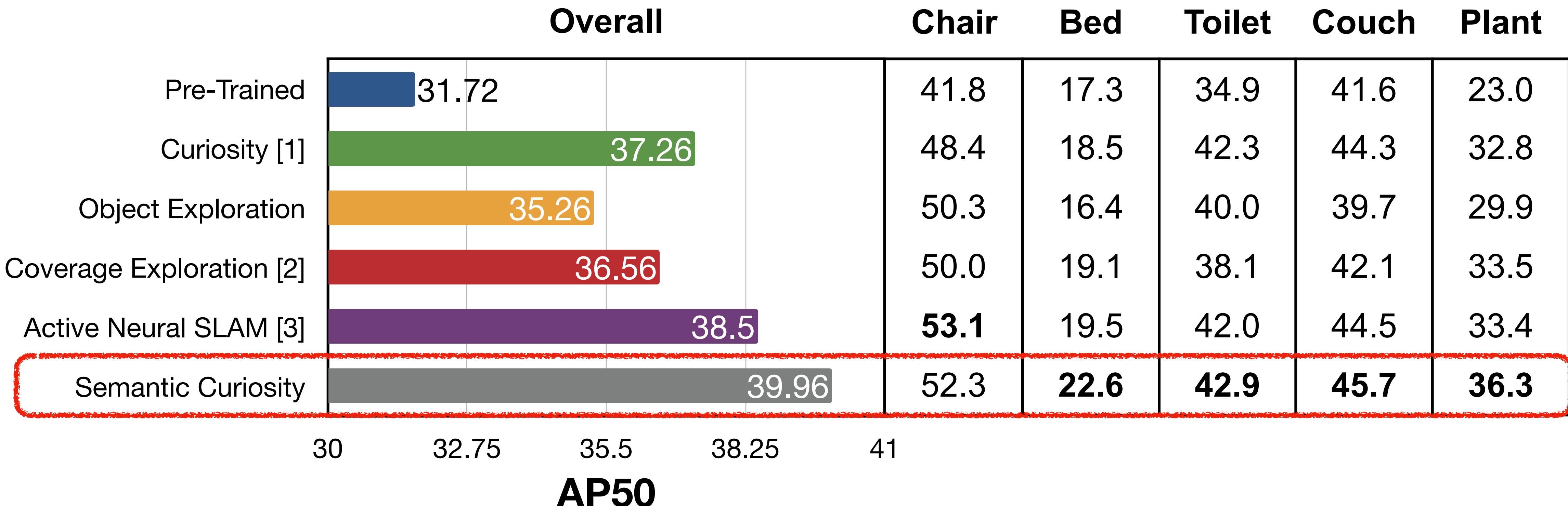
Results

Quality of object detection on training trajectories



*Adapted from [1] Pathak et al. ICML-17, [2] Chen et al. ICLR-19, [3] Chaplot el al. ICLR-20

Results



*Adapted from [1] Pathak et al. ICML-17, [2] Chen et al. ICLR-19, [3] Chaplot el al. ICLR-20

Demo Video

Observation



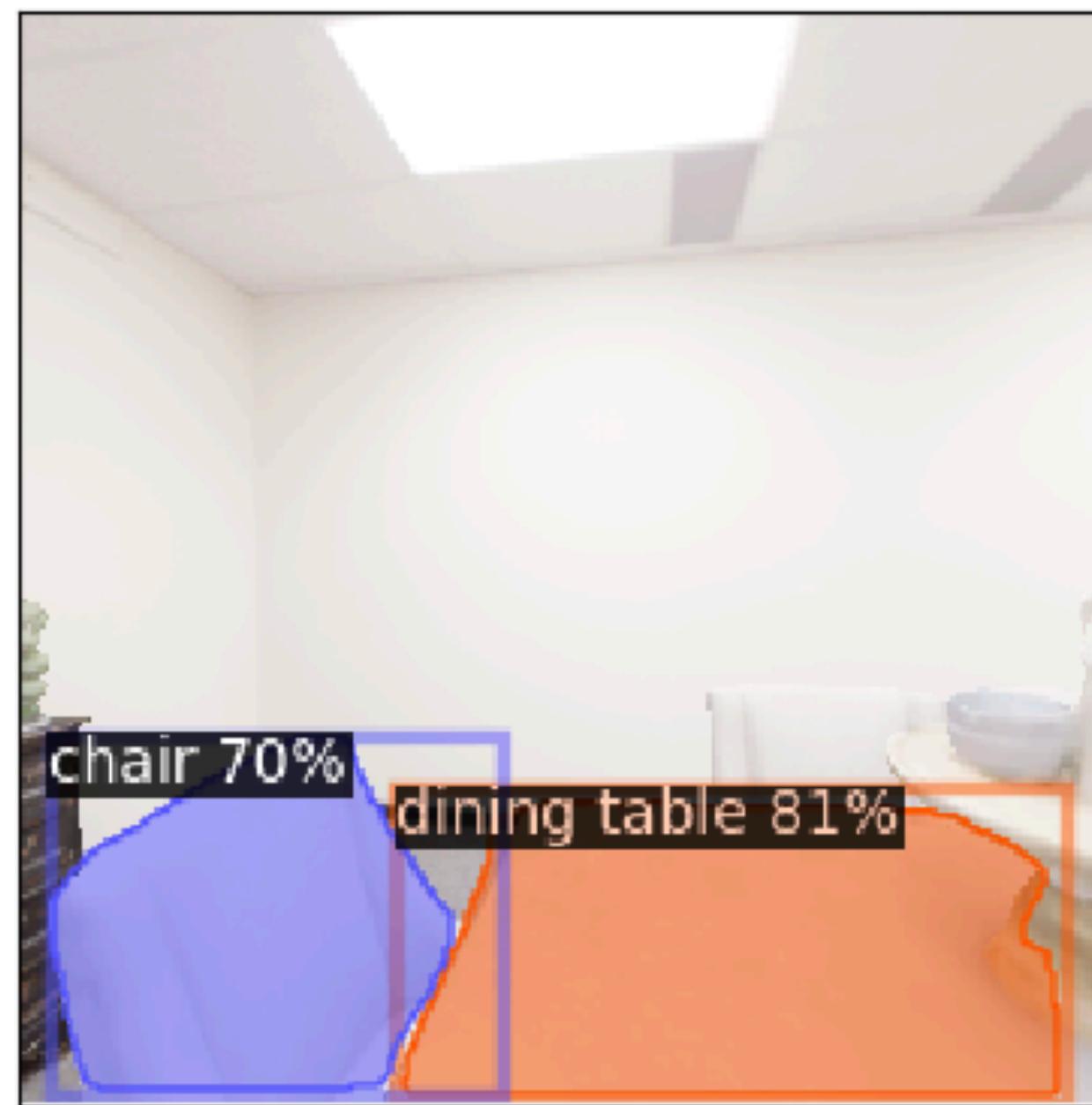
Semantic Map



Temporal Inconsistency

Episode 1

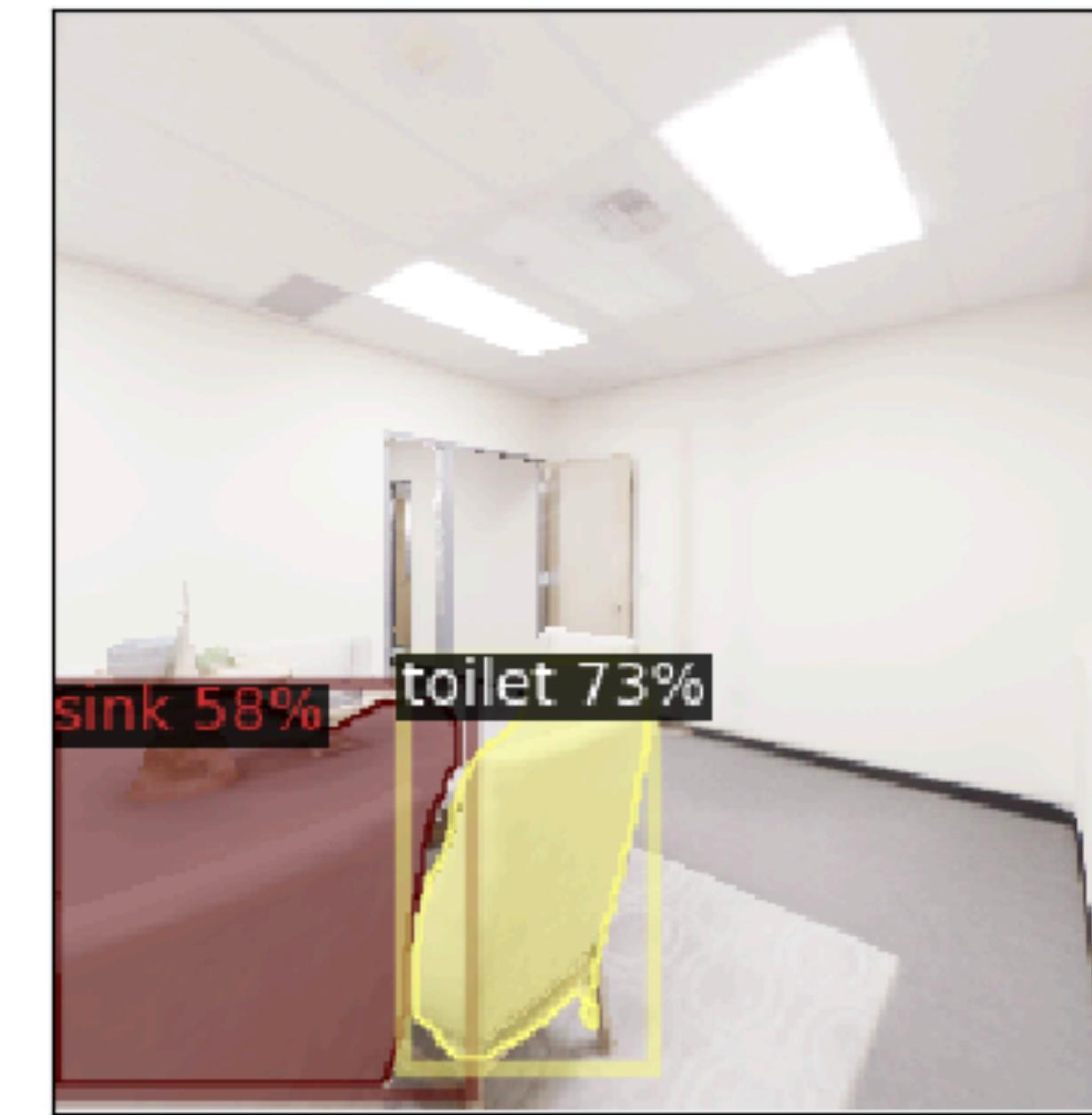
Time



Temporal Inconsistency

Episode 2

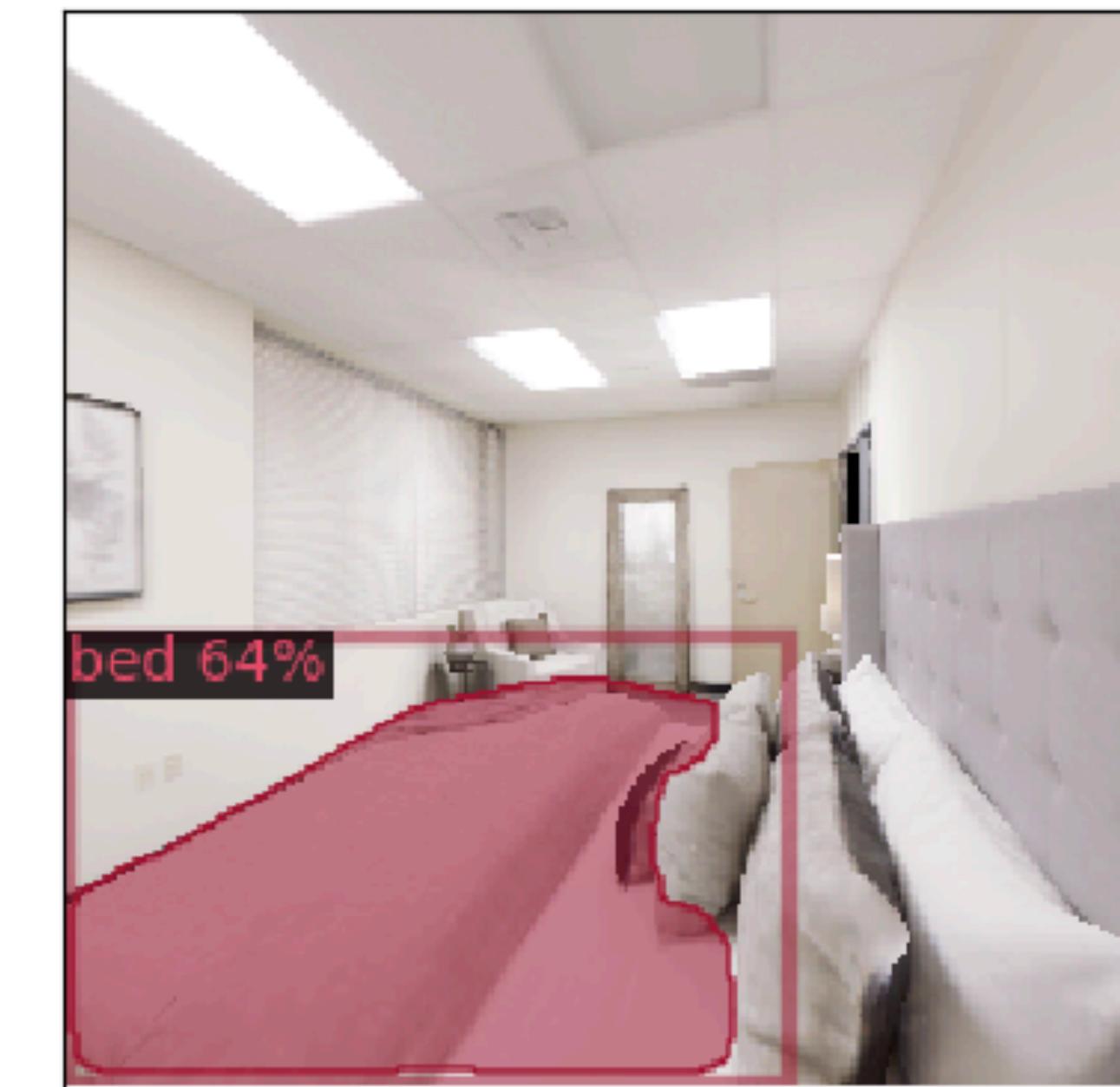
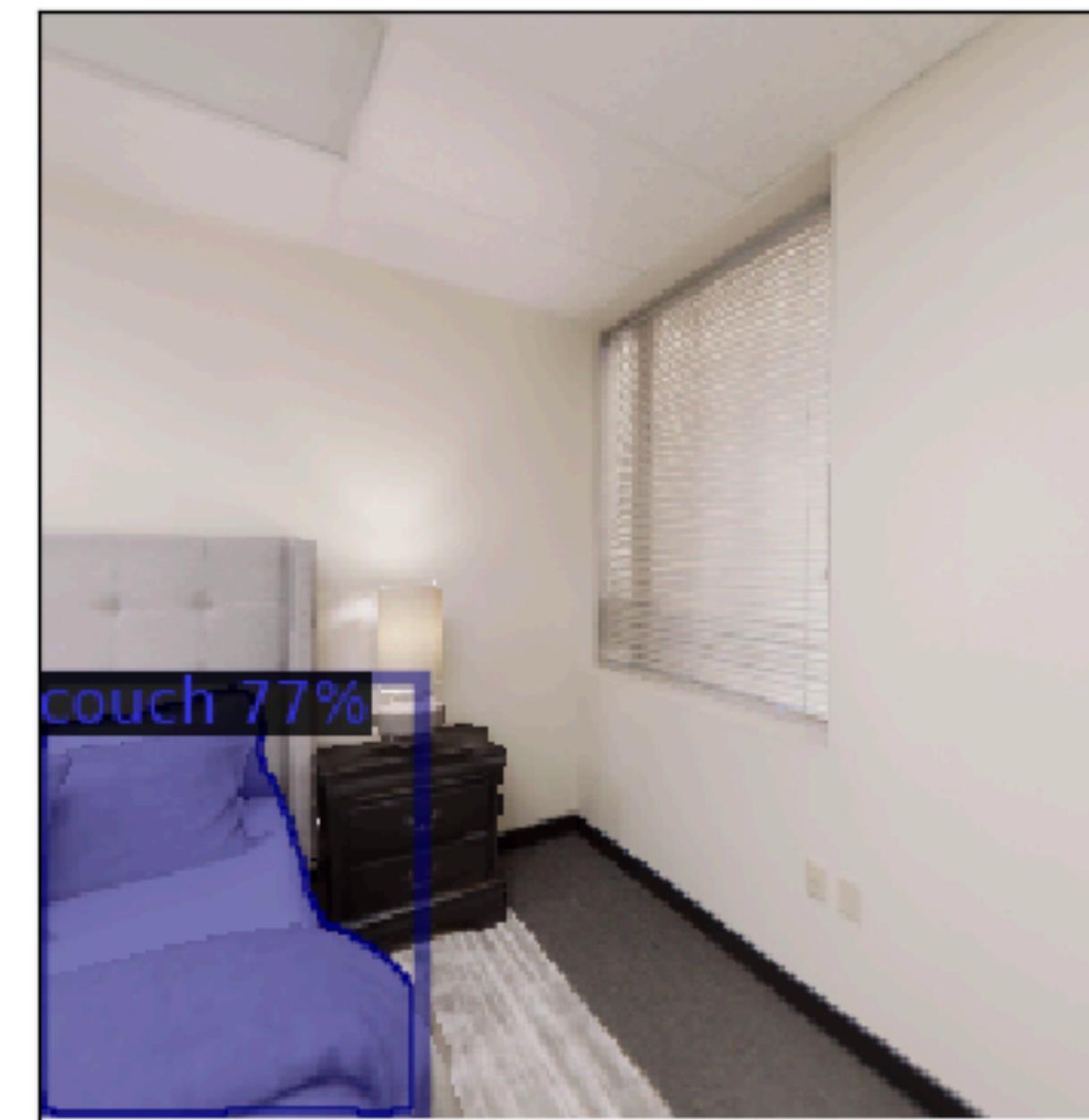
Time

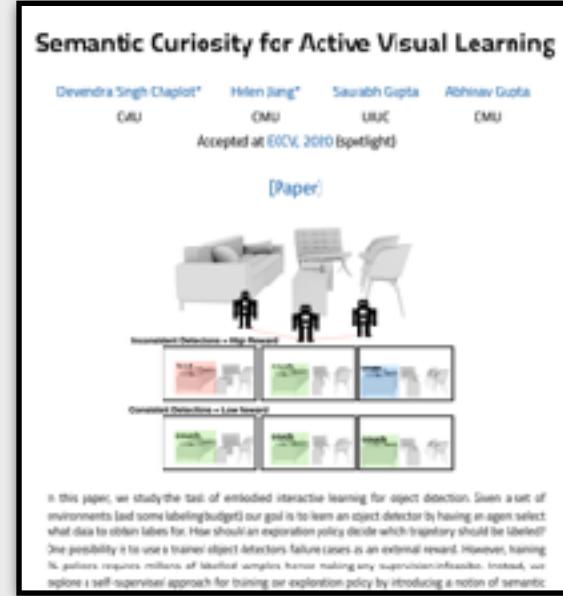


Temporal Inconsistency

Episode 3

Time





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Thank you



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