

Semantic Curiosity for Active Visual Learning

ECCV-2020

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



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Active Visual Learning



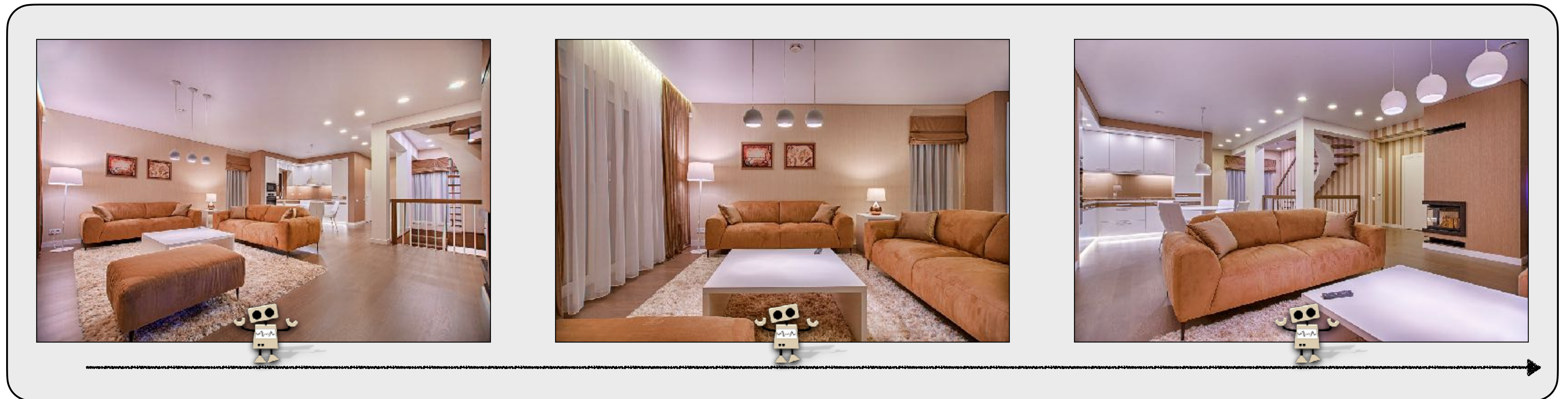
- *Static Datasets*
- *Great for benchmarking*
- *Long-tail problem*



- *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.*

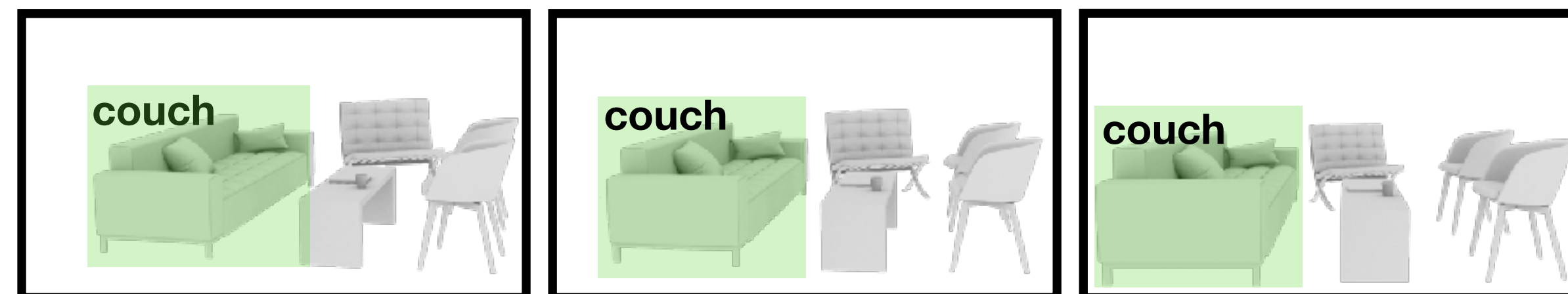
Semantic Curiosity



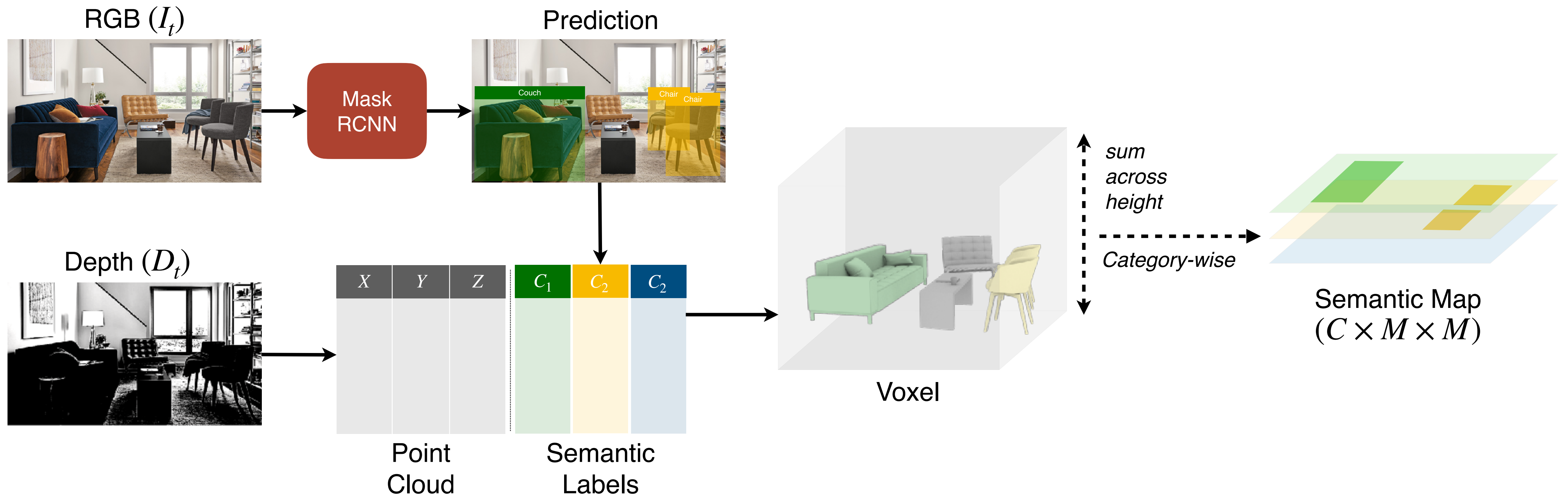
Inconsistent Detections = High Reward



Consistent Detections = Low Reward



Semantic Mapping

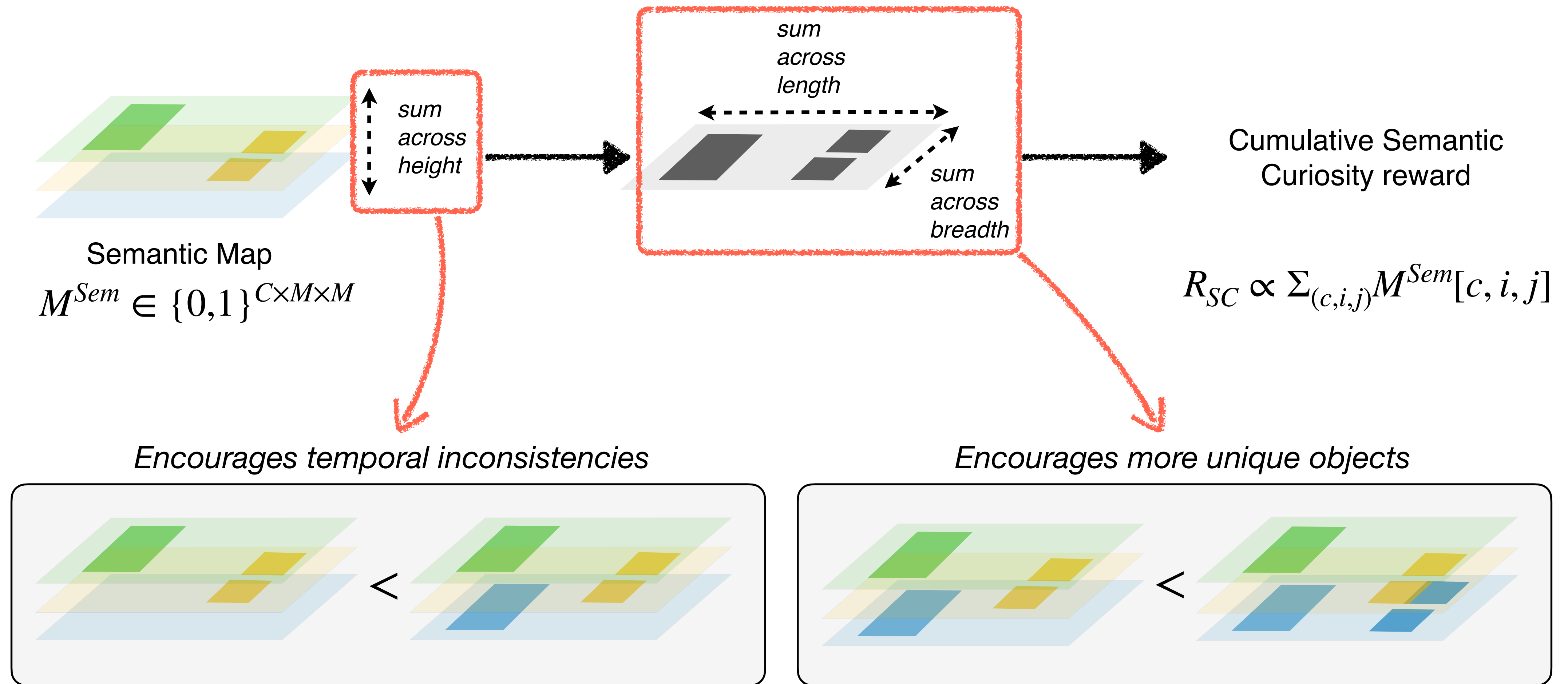


Semantic Mapping

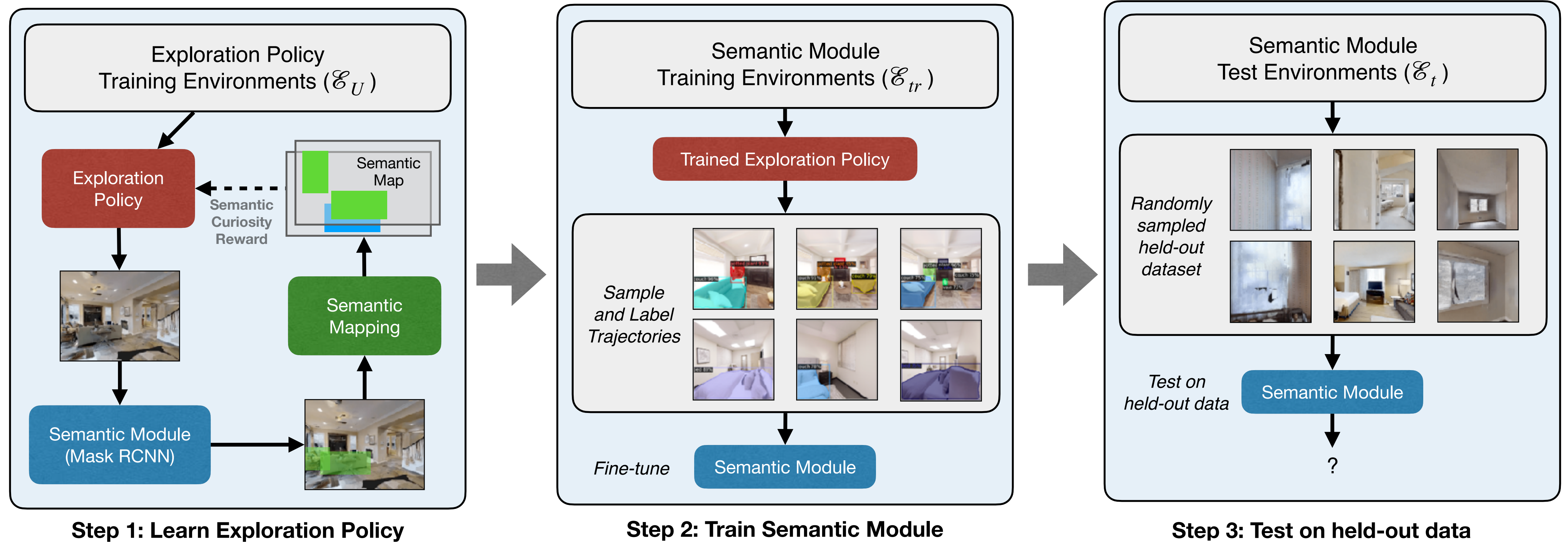
Time →



Semantic Curiosity

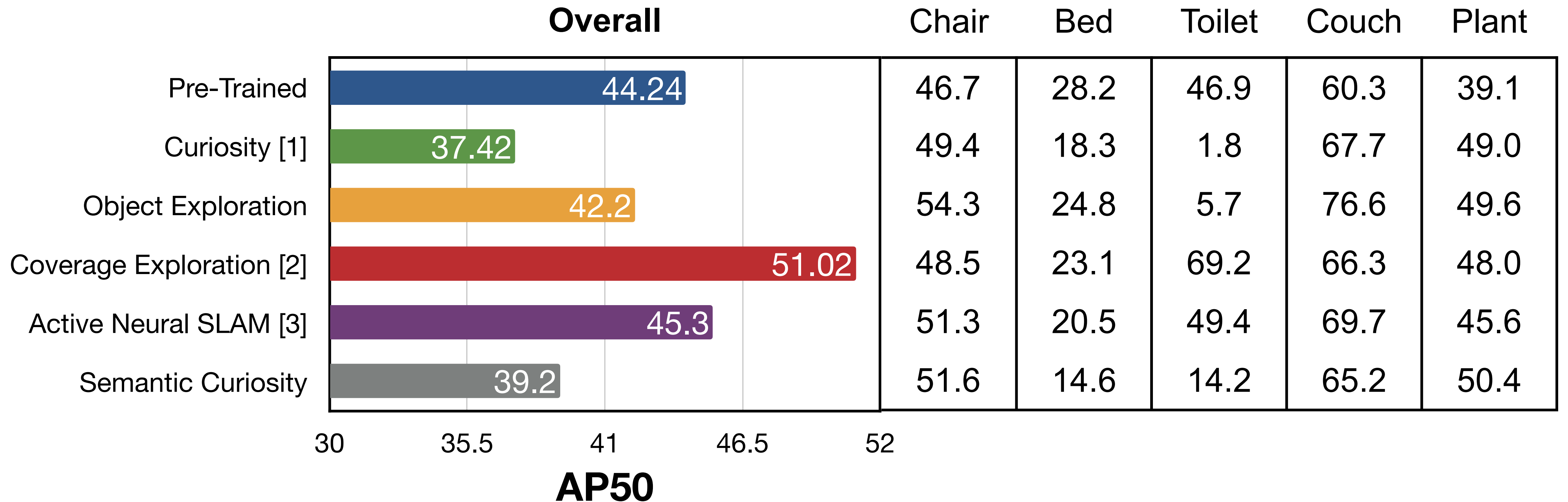


Method Overview



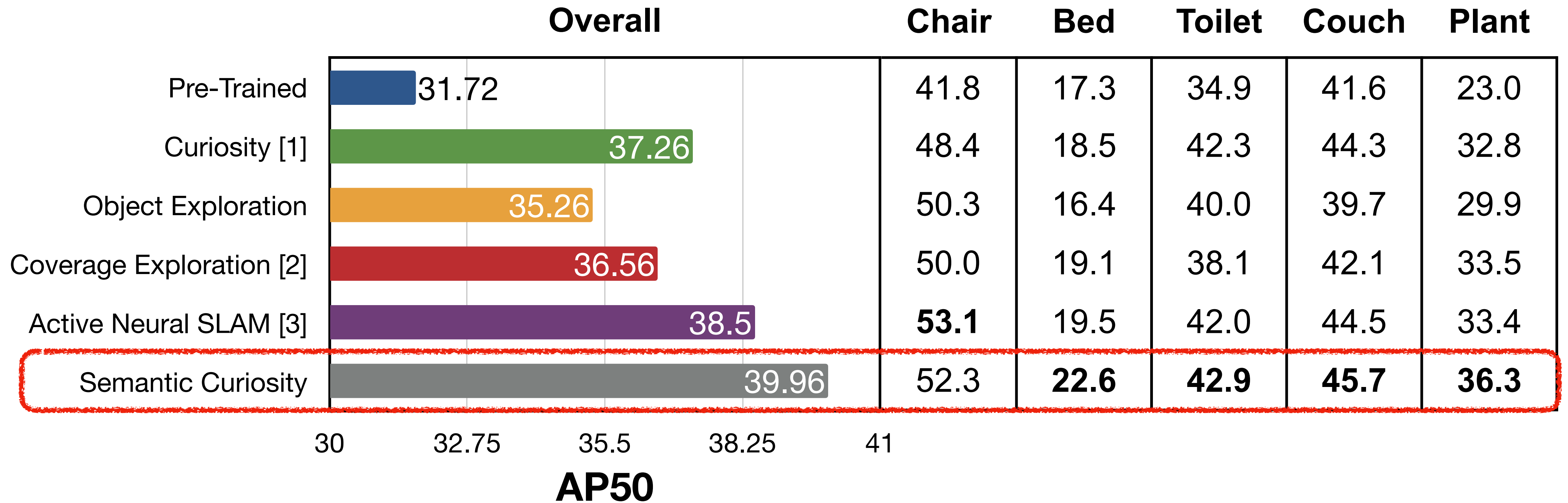
Results

Quality of object detection on training trajectories



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

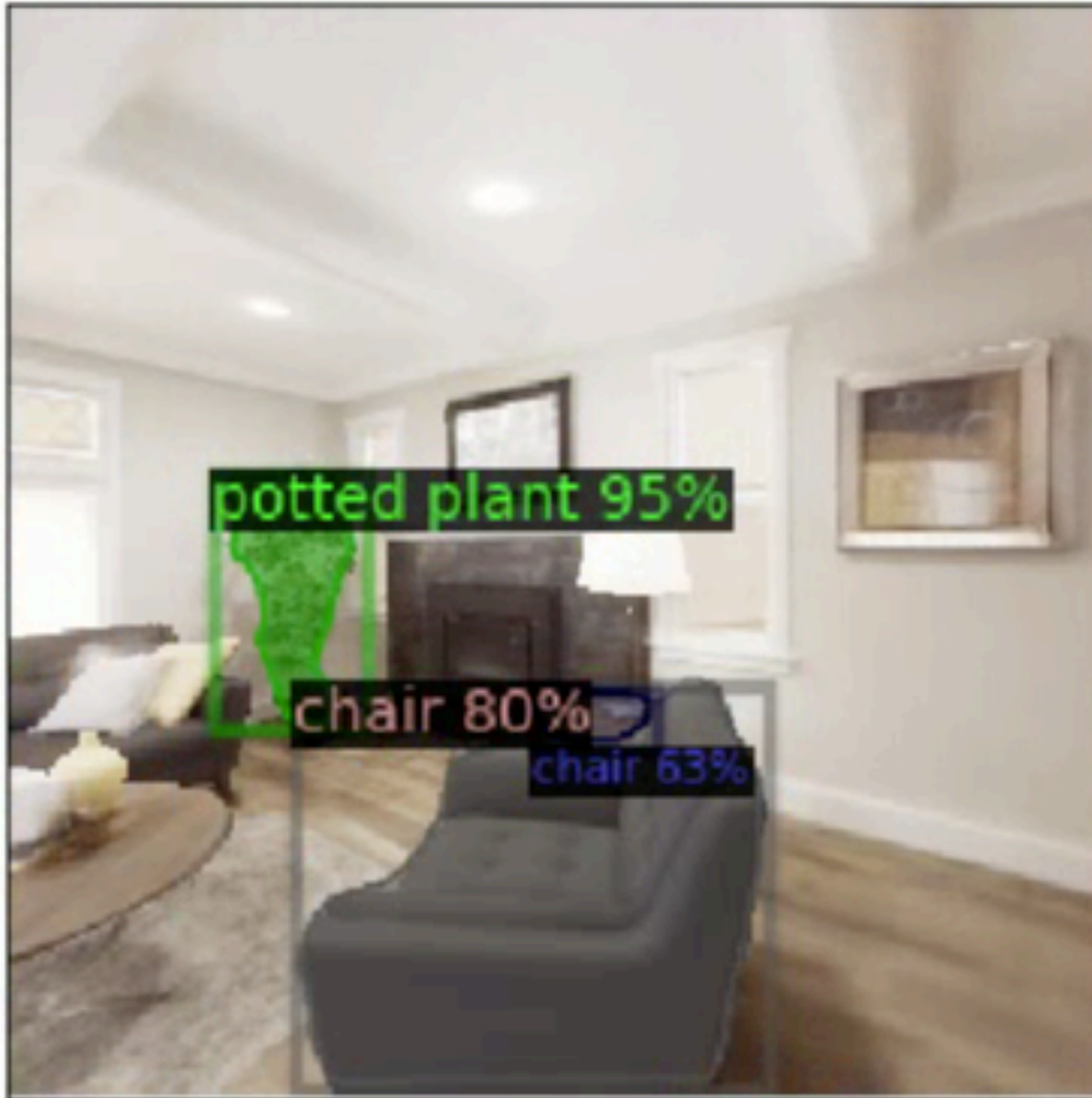
Results



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

Demo Video

Observation



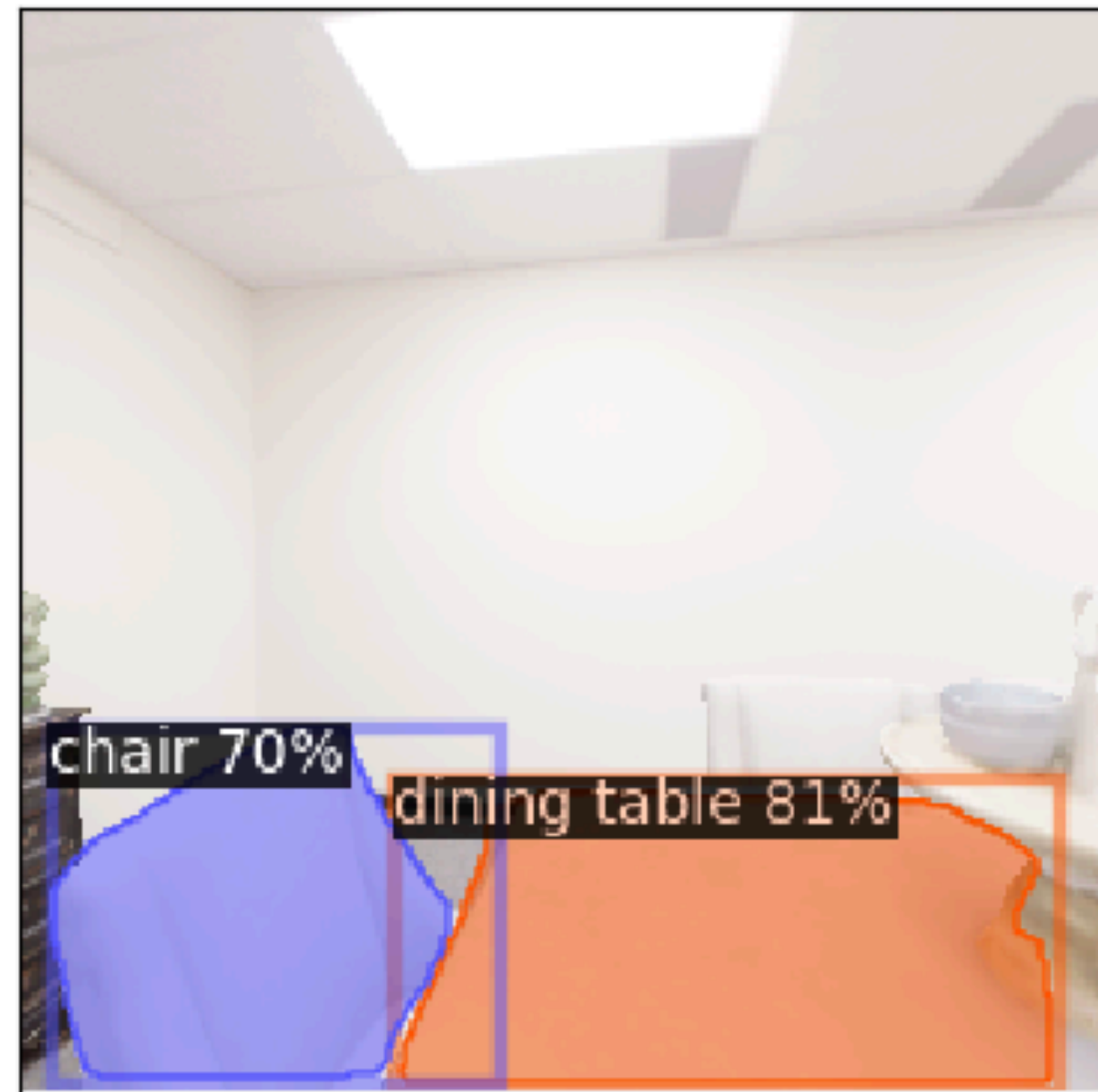
Semantic Map



Temporal Inconsistency

Time

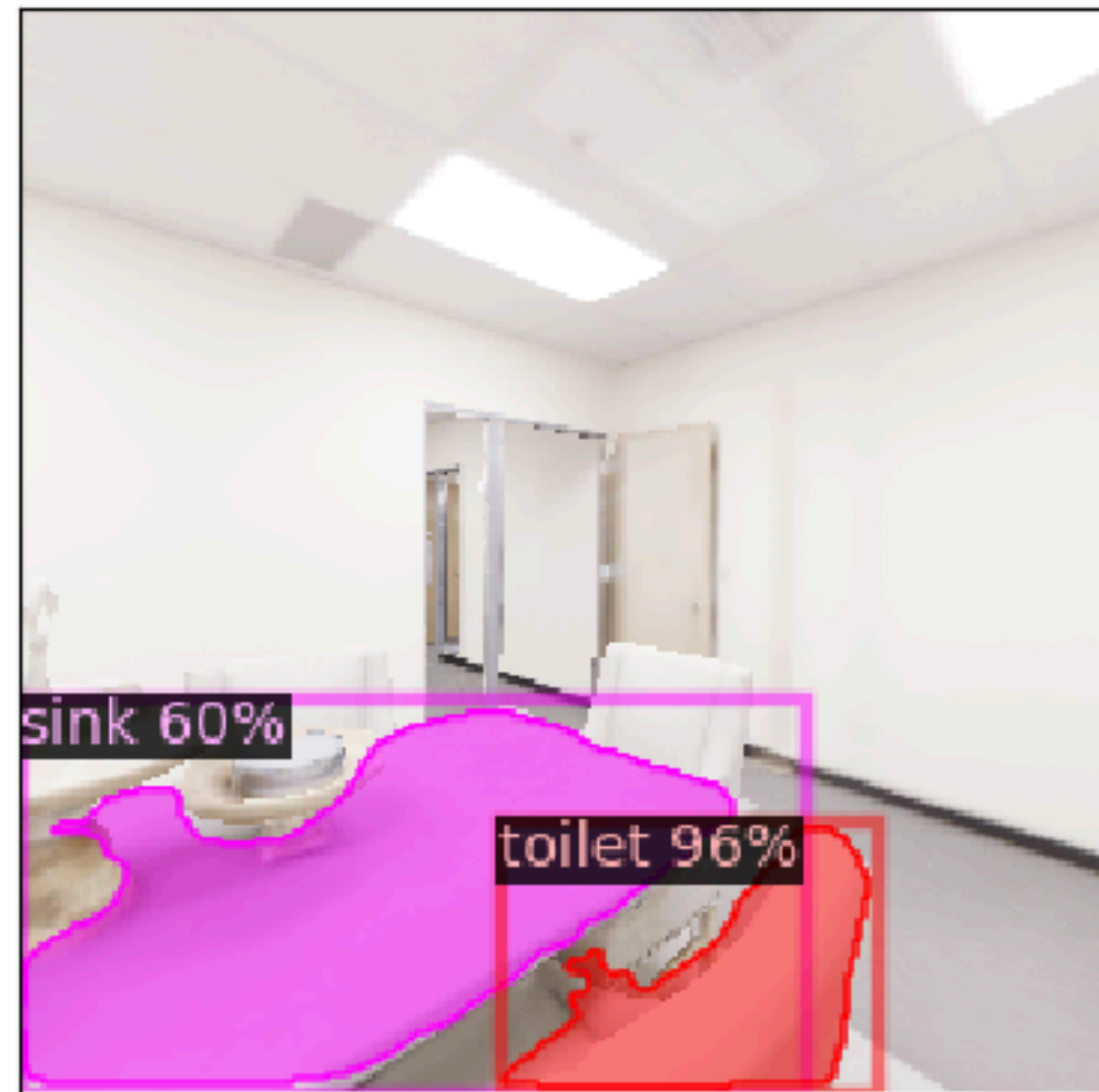
Episode 1



Temporal Inconsistency

Time

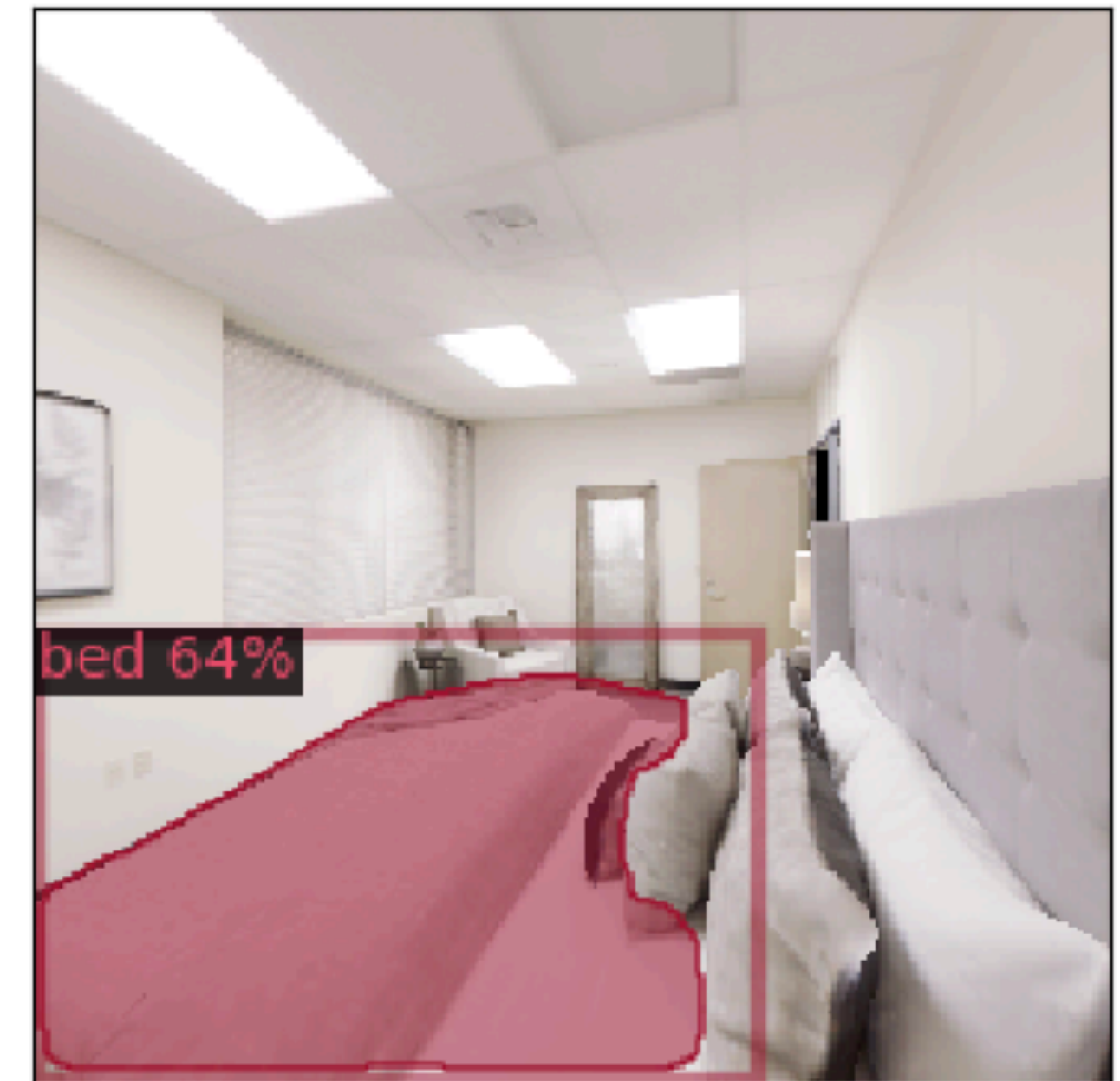
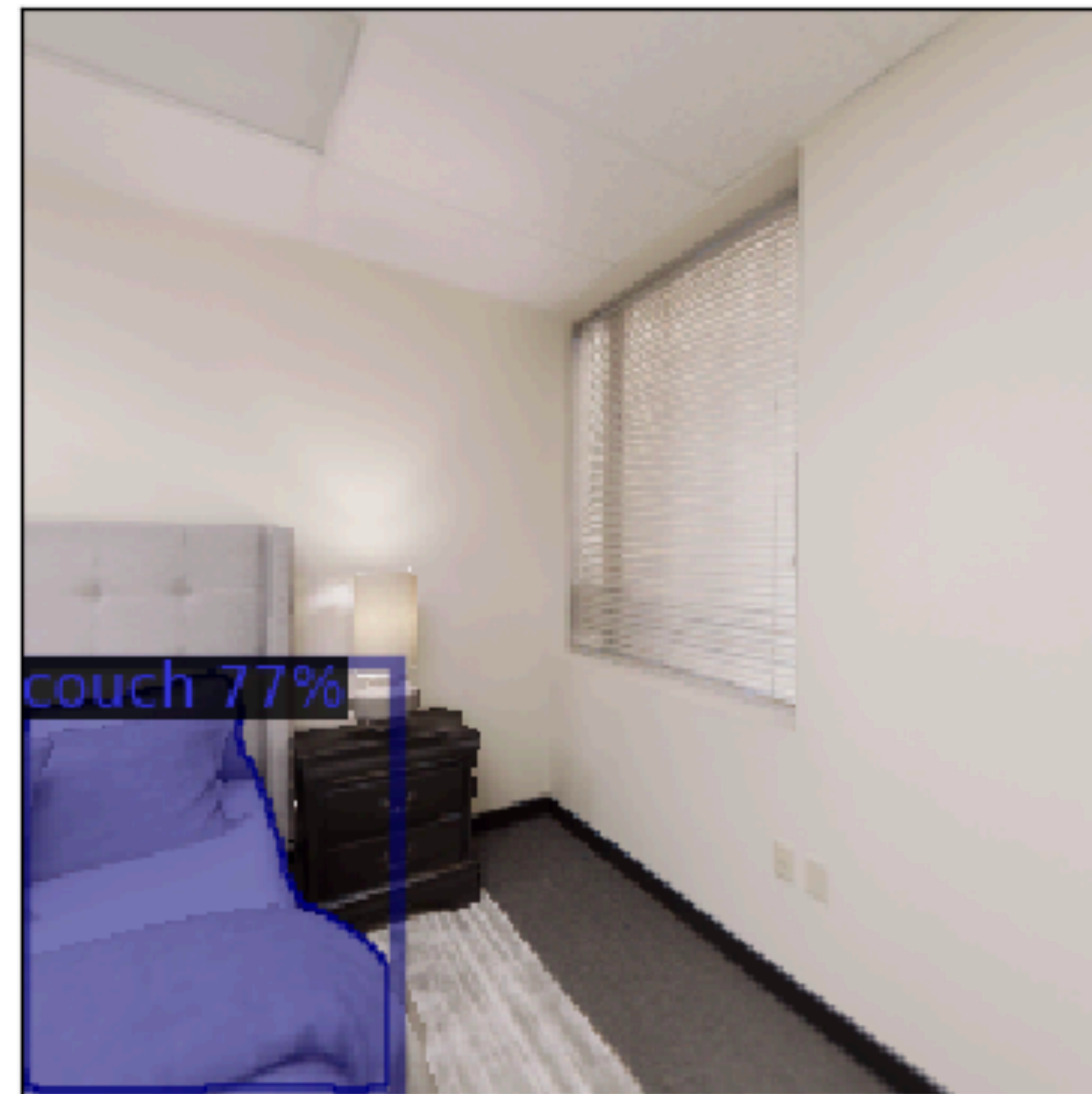
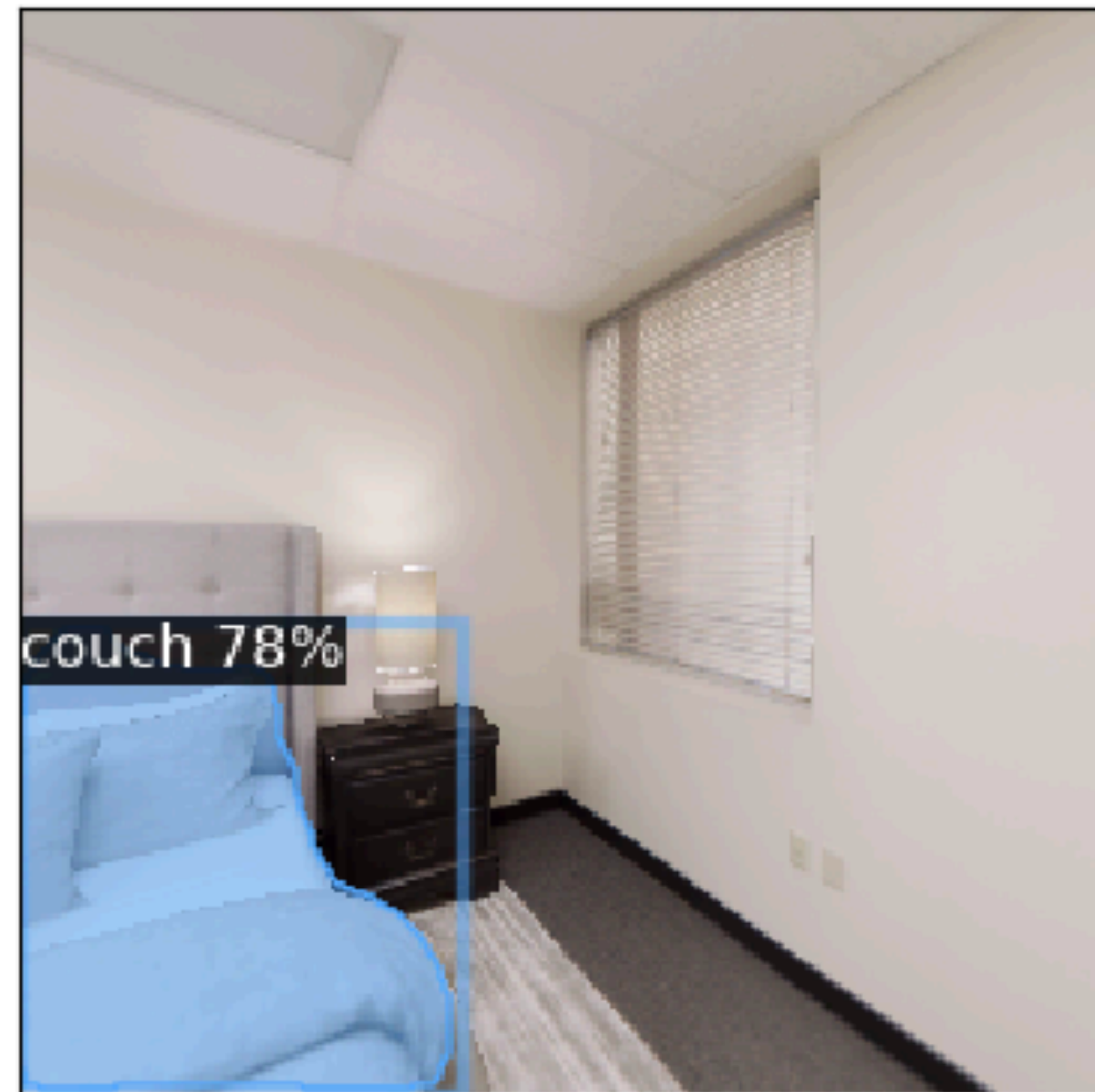
Episode 2

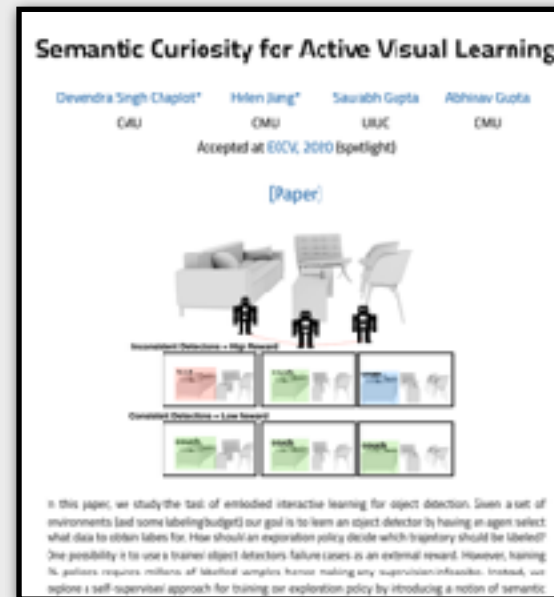


Temporal Inconsistency

Time

Episode 3





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Thank you



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