Toward Practical Monocular Indoor Depth Estimation

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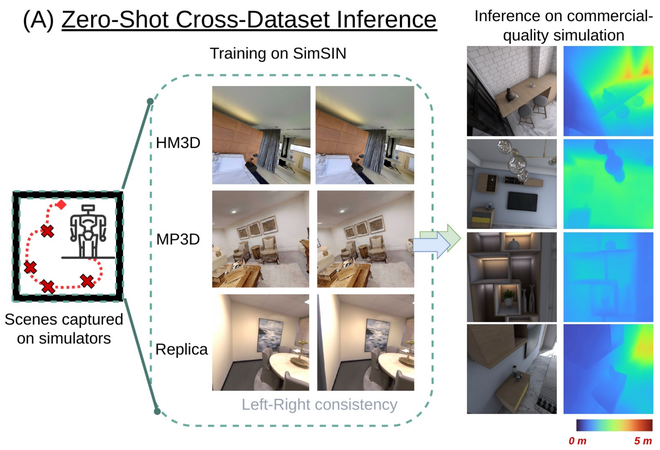
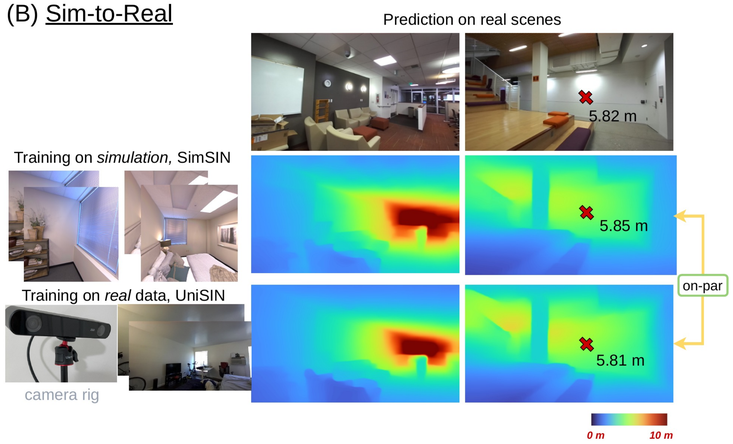
Advantages

(A) Zero-Shot Cross-Dataset Inference



(B) Sim-to-Real



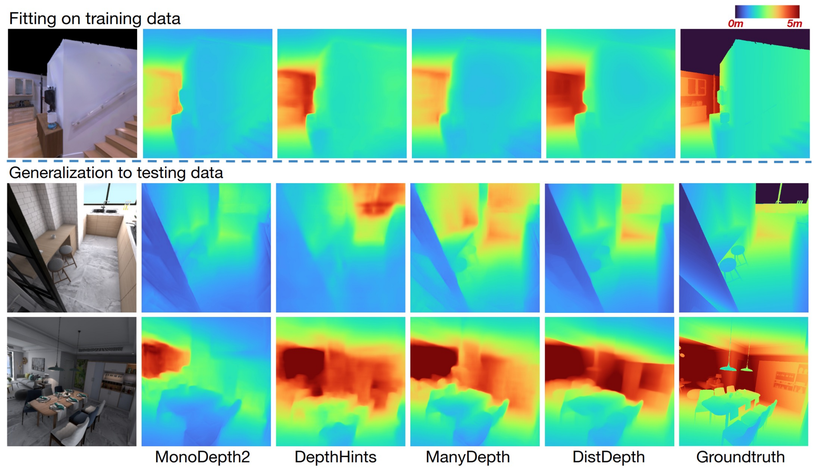
Practical Depth Estimation

- Learning without curated depth groundtruth
- Efficient and effective data collection by simulator
- High generalizability and accurate and real-time performance

Motivation

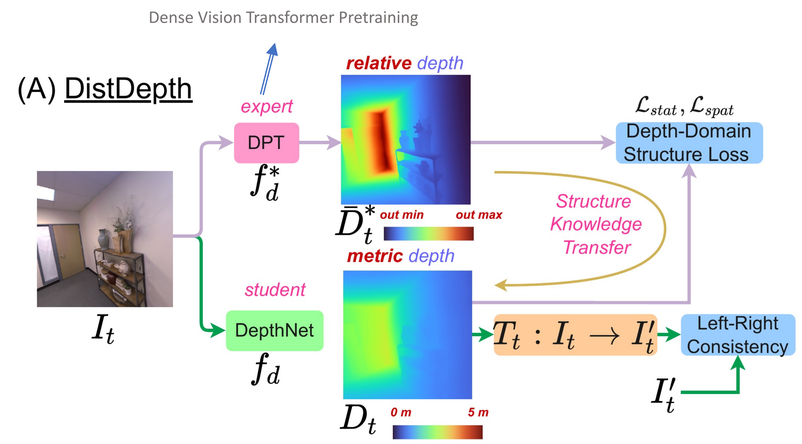
- Most prior works for self-supervised depth focus on outdoor driving scenes. However, the applicability is yet to be investigated.
- Either cross-data evaluation and sim-to-real evaluation for indoor scenes has not explored much.

Fitting on Training Scenes

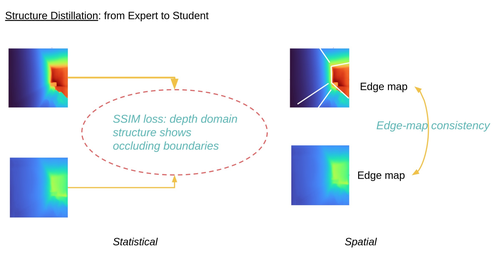


Prior left-right consistency methods can fit well on training scenes, but they do generalize to testing scenes with complex structures.

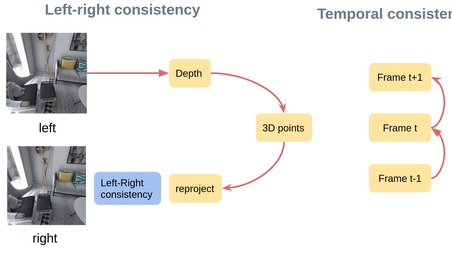
Method



(1) Depth-Domain Structure Loss:

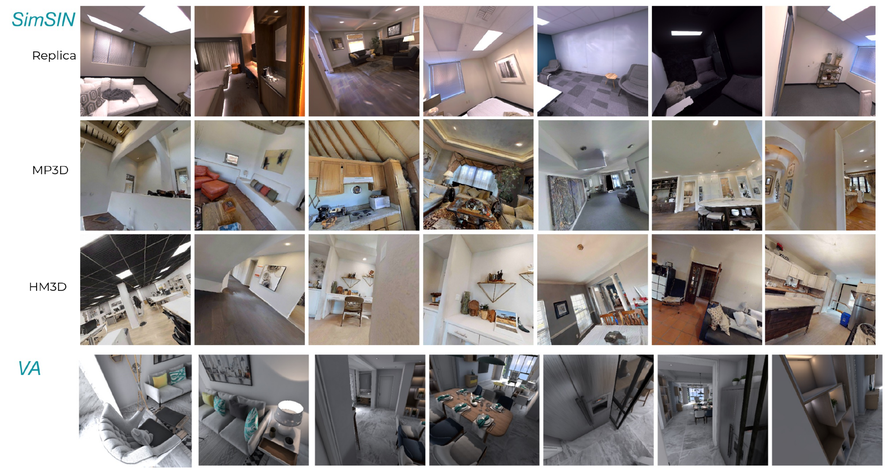


(2) Left-Right Consistency:



Combining metrics from left-right pairs and structures from relative depth pretraining

Collected Datasets and Results



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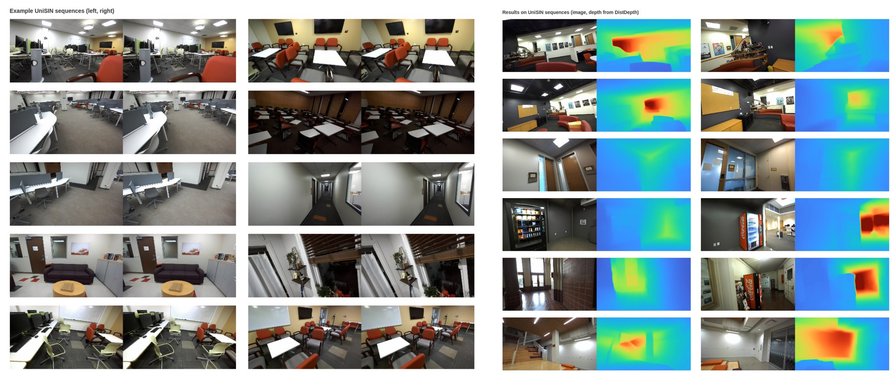
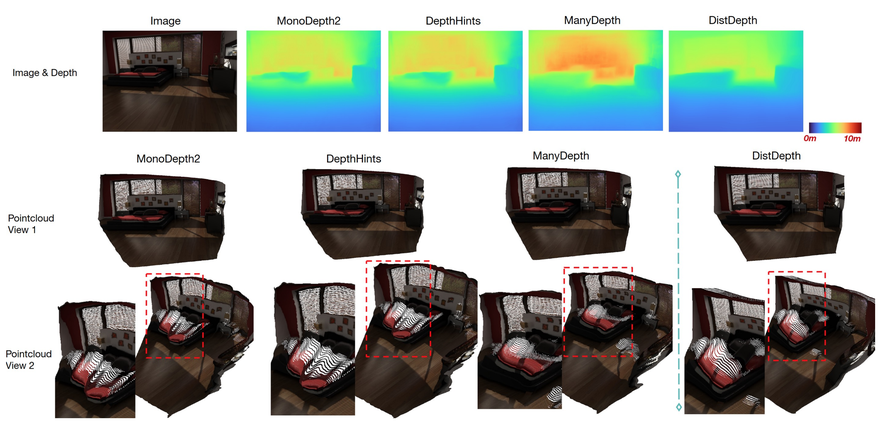


Results



Take a photo to learn more:

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