



CAGE: Continuity-Aware edGE Network Unlocks Robust Floorplan Reconstruction

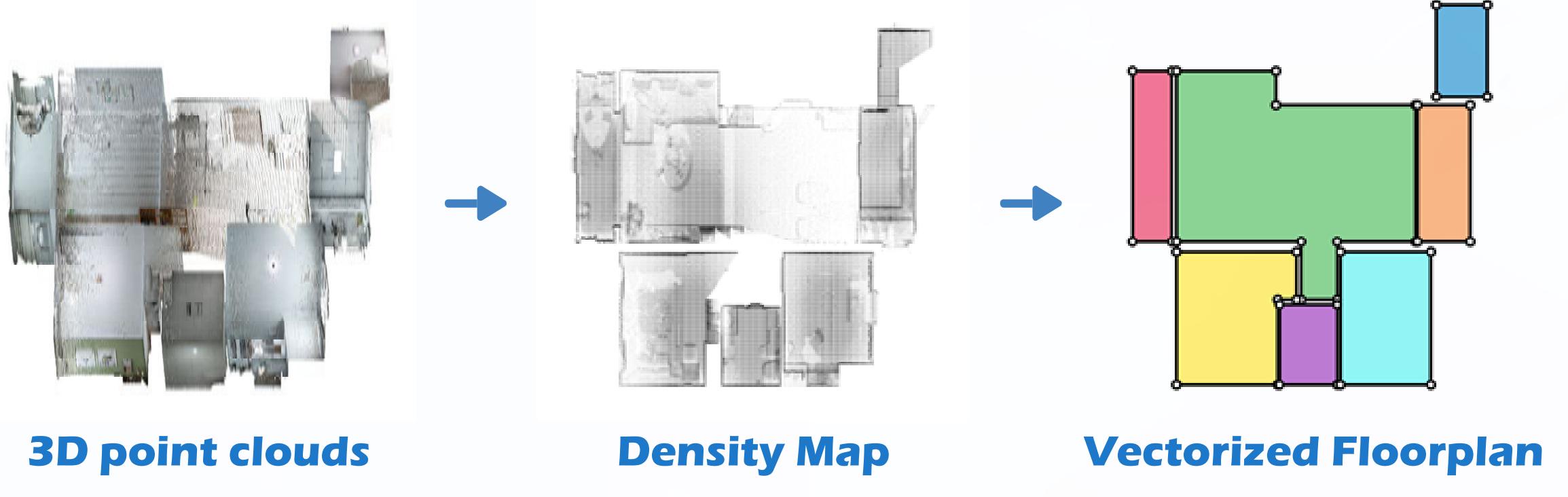
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NEURAL INFORMATION
PROCESSING SYSTEMS

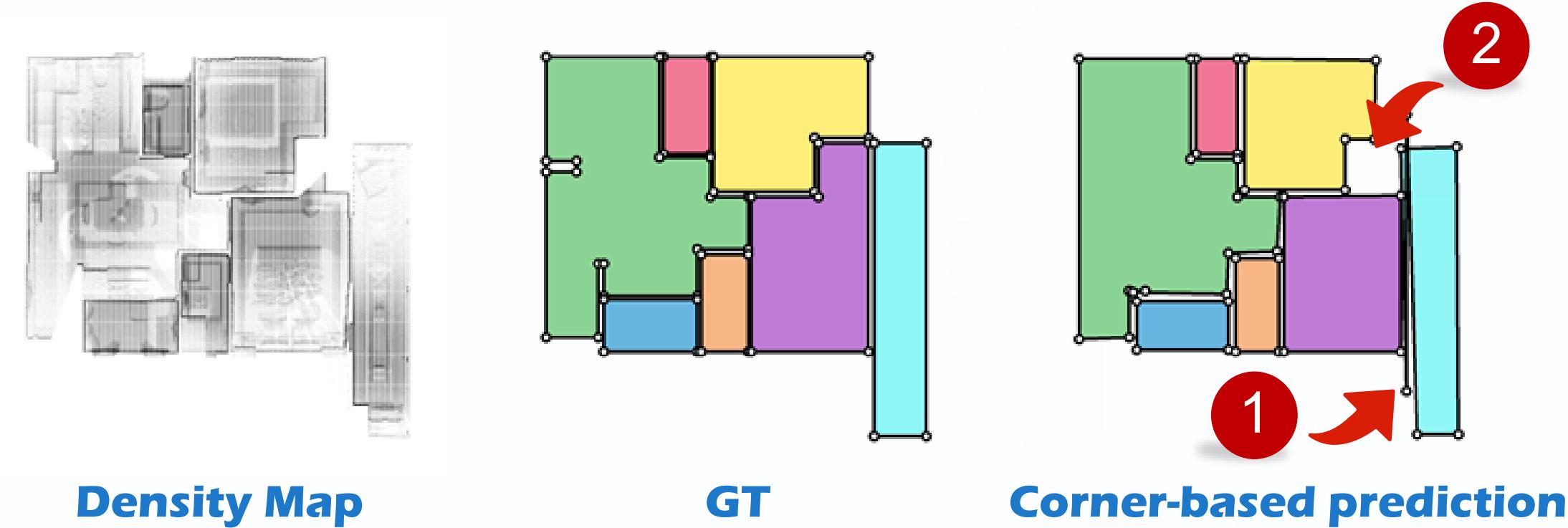
Background



Motivations

💡 Humans naturally perceive indoor spaces through continuous walls rather than discrete corners.

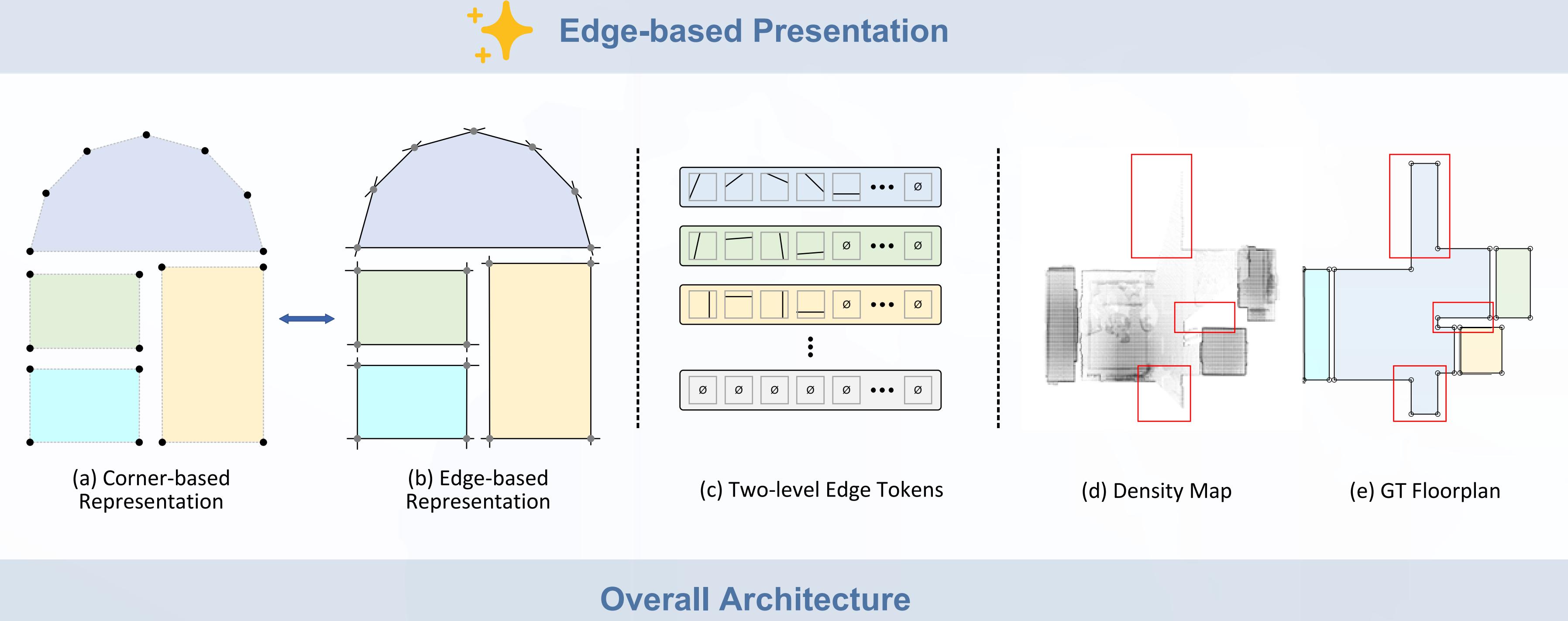
💡 Corner-based polygon representation may lead to several kinds of geometric and topological inconsistencies such as:
 (1) self-intersections
 (2) sensitivity to missing or noisy corners



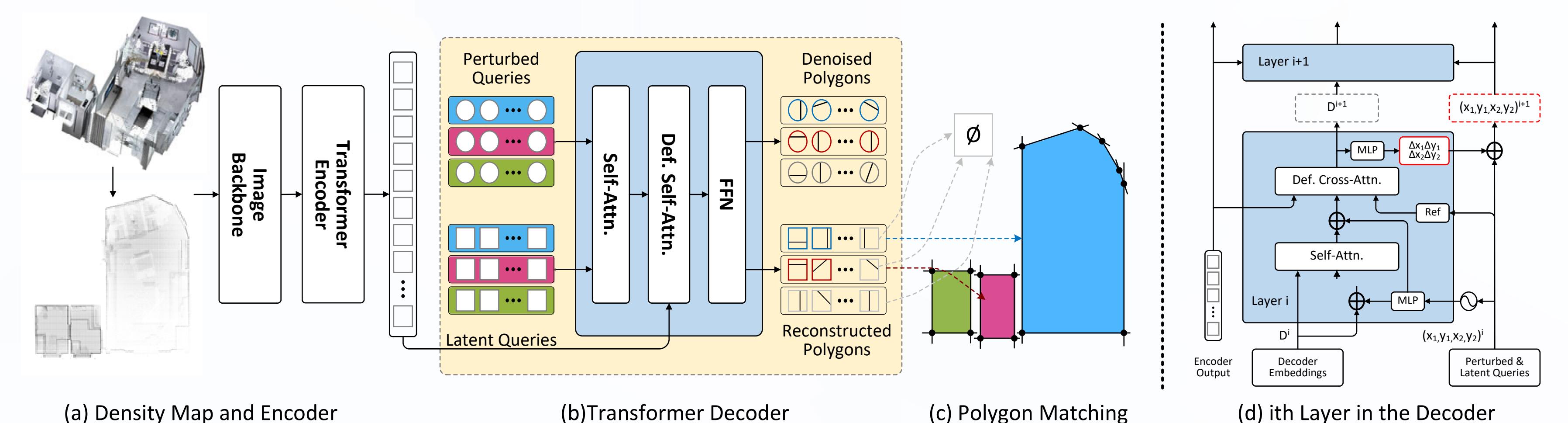
Contributions

- ★ **Continuity-Aware Edge Representation:** We introduce an edge-based polygon formulation that enhances robustness to incomplete and noisy data, while preserving directional and structural consistency.
- ★ **Dual-Query Transformer Decoder:** Our approach leverages perturbed and latent queries within a denoising framework to stabilize training, refine predictions, and accelerate convergence.
- ★ **Strong Performance and Generalization:** We achieve state-of-the-art performance on multiple benchmarks and generalize effectively across datasets, validating the effectiveness of our continuity-aware edge-based formulation.

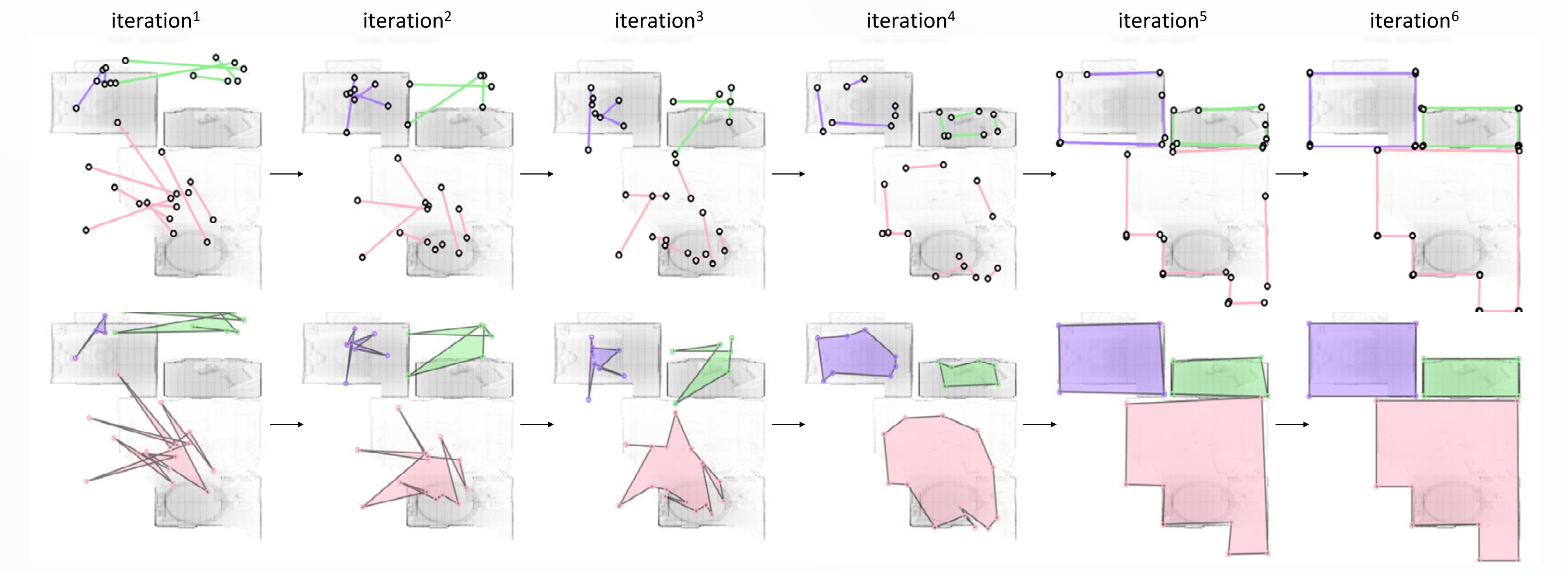
Method



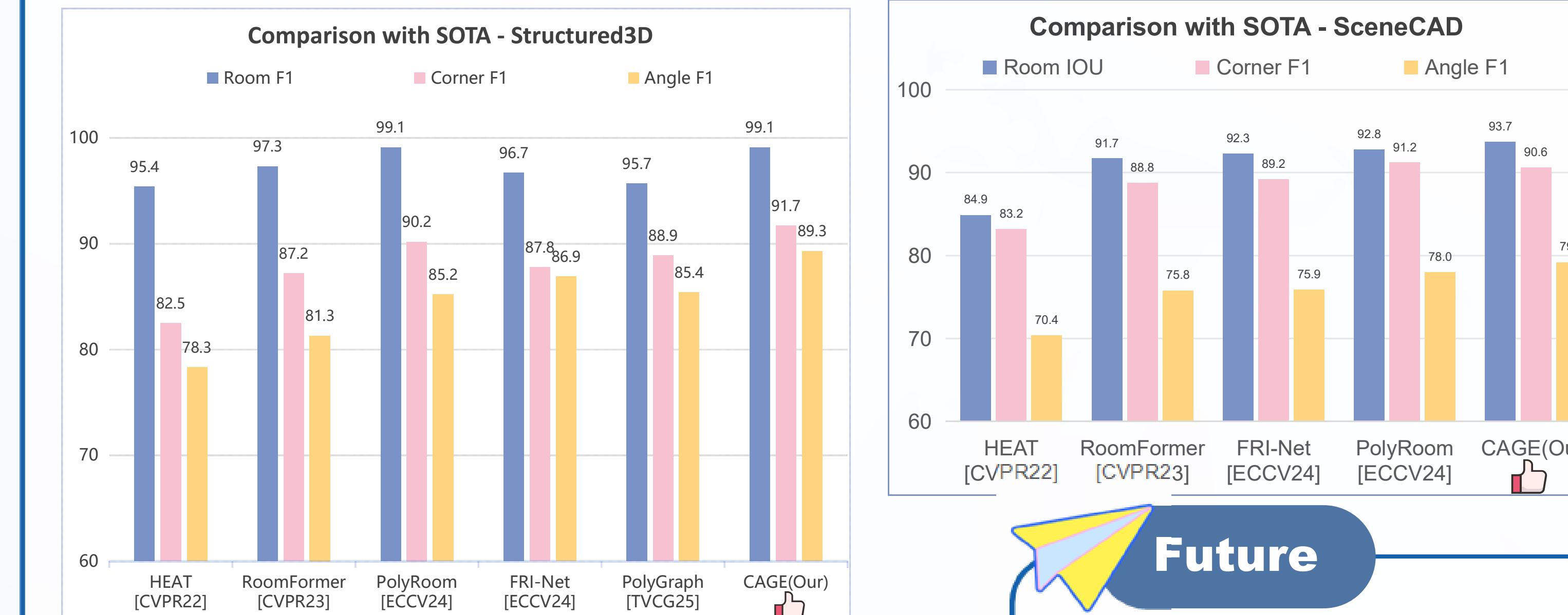
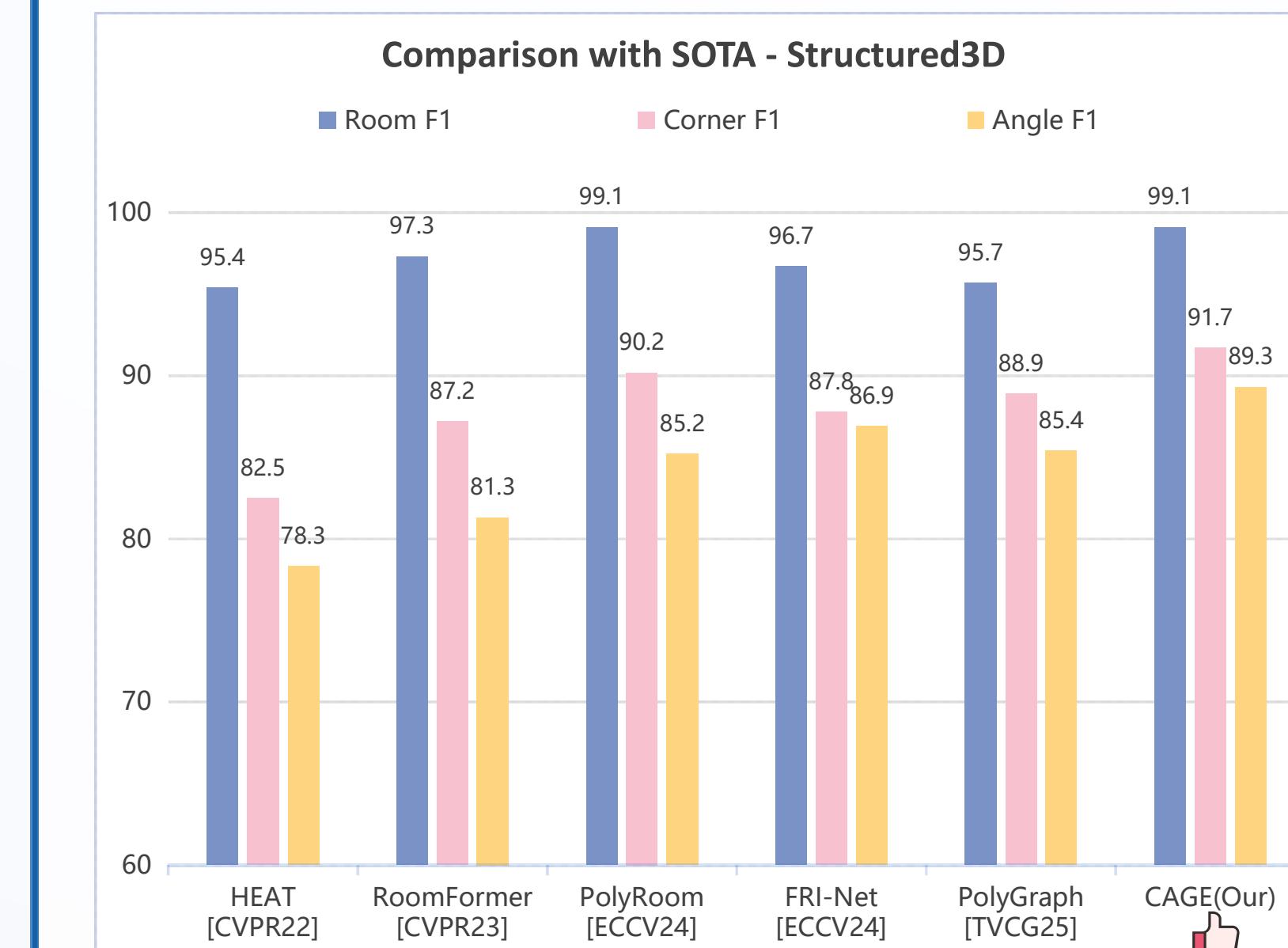
Overall Architecture



Polygon evolution



Results



Future

More applications on:

