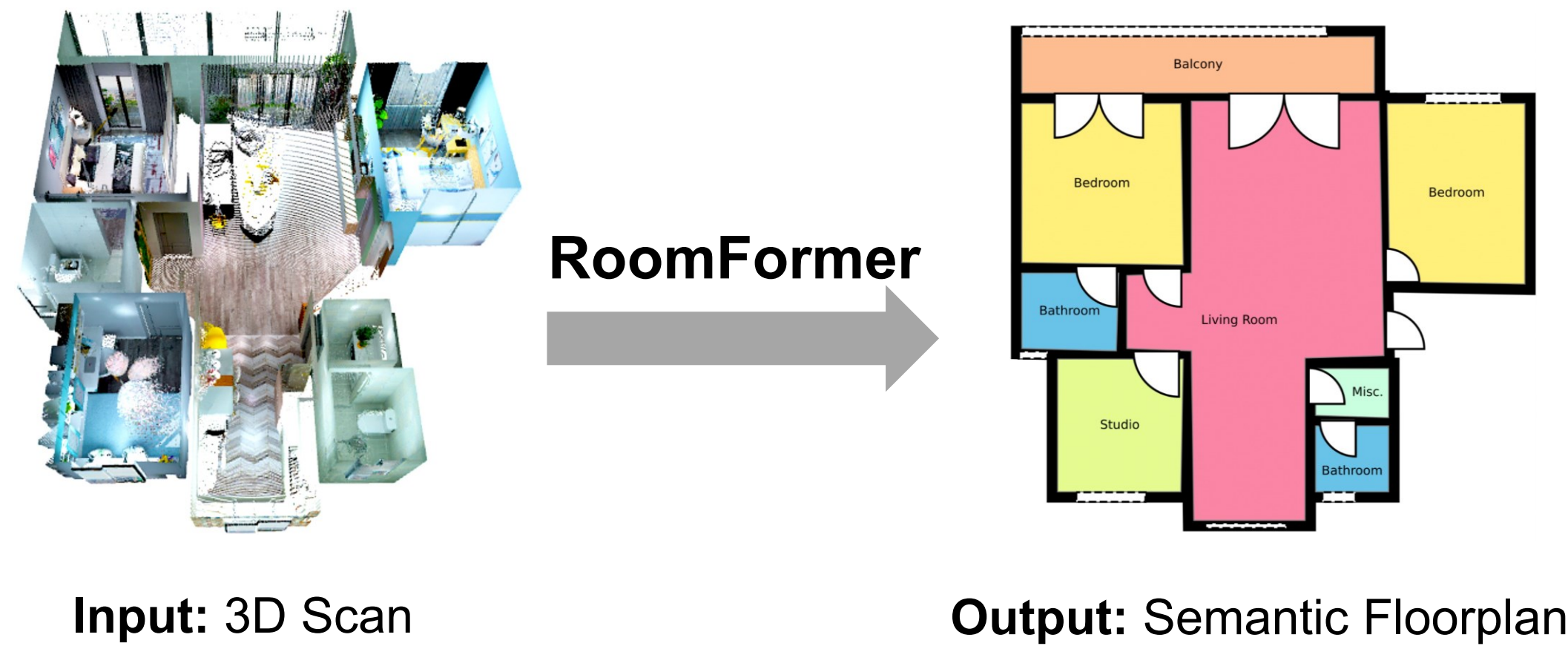
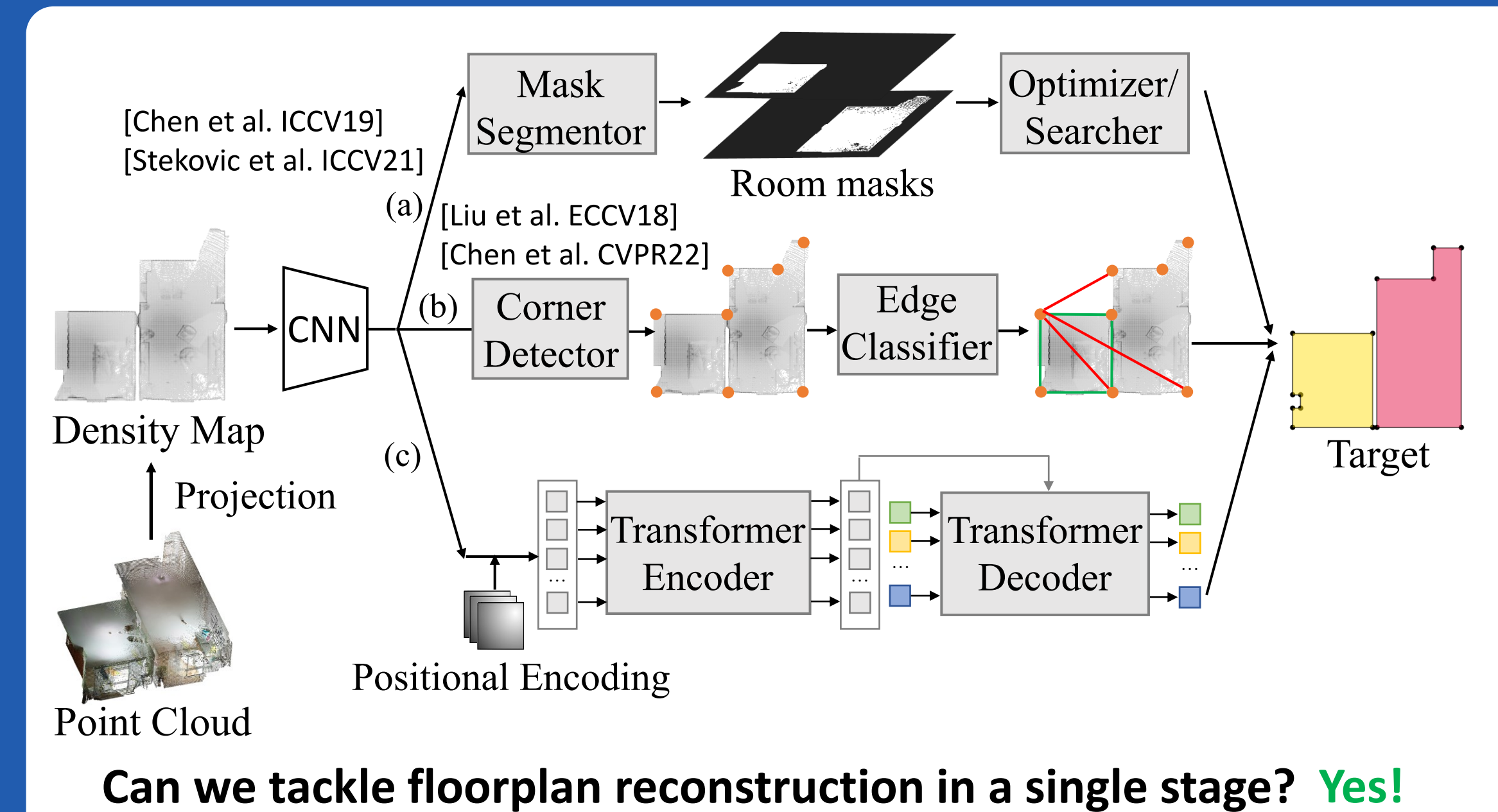




1. Task: 2D Floorplans from 3D Scans

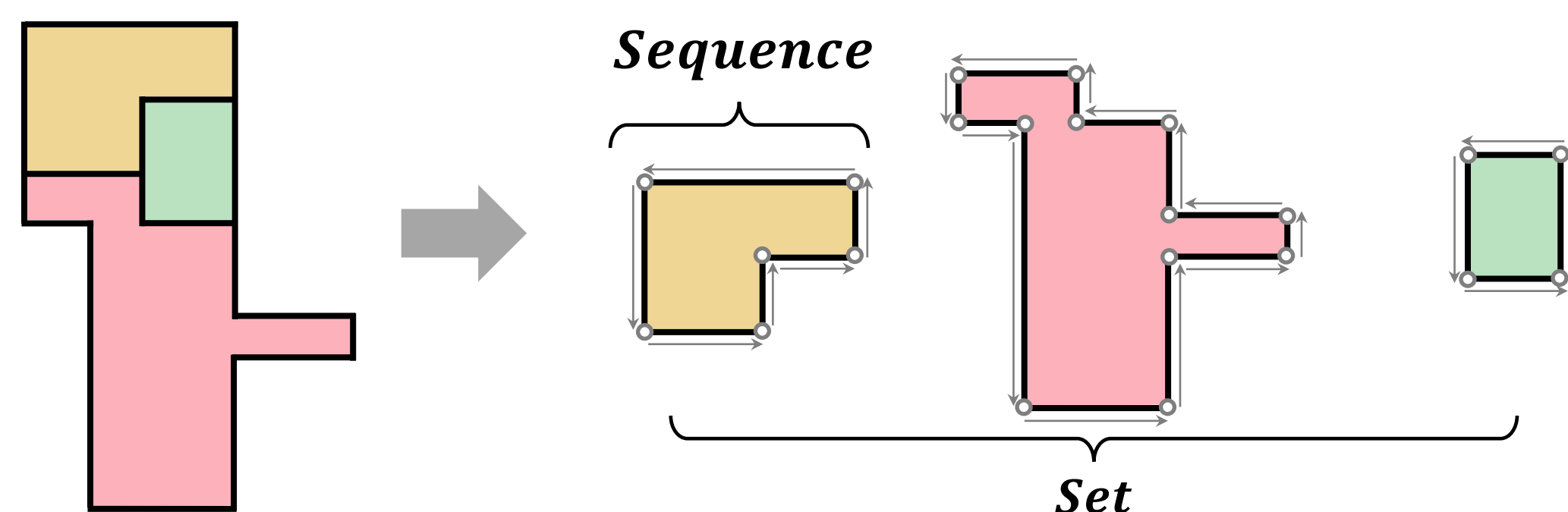


2. Motivation

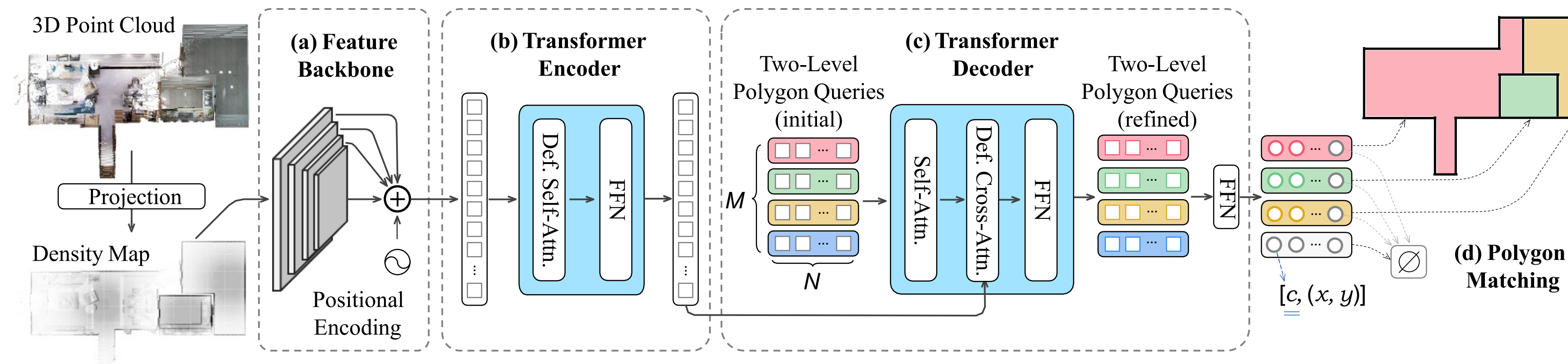


3. Core Idea

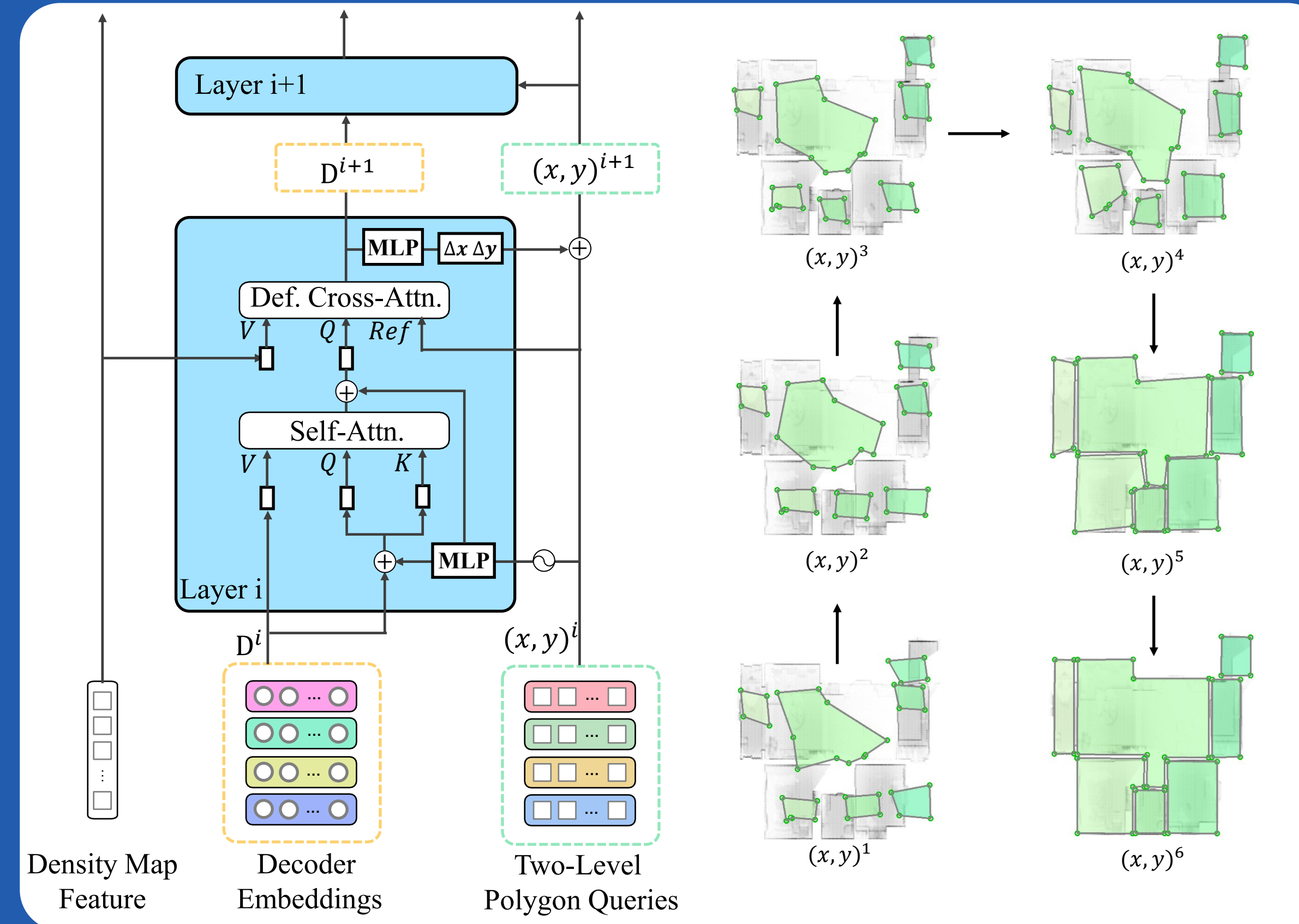
Formulate floorplan reconstruction as a direct set prediction problem of polygons.



4. Overall Architecture



5. Modeling Floorplan As Two-level Queries



6. Polygon Matching

Match the fixed-number predictions with the arbitrary-number ground truth

$$\hat{\sigma} = \sum_{m=1}^M \arg \min_{\sigma} \mathcal{D}(V_m, \hat{V}_{\sigma(m)}) \quad \mathcal{D}(V_m, \hat{V}_{\sigma(m)}) = \lambda_{cls} \mathcal{D}(c, \hat{c}) + \lambda_{coord} \mathcal{D}(p, \hat{p})$$

Loss: $\mathcal{L} = \sum_{m=1}^M (\lambda_{cls} \mathcal{L}_{cls}^m + \lambda_{coord} \mathcal{L}_{coord}^m + \lambda_{ras} \mathcal{L}_{ras}^m)$

8. Towards Semantically-Rich Floorplans



7. Comparison with State-of-the-art Methods

