Floor-SP: Inverse CAD for Floorplans
by Sequential Room-wise Shortest Path
Supplementary Material

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Fig. 1 provides the full qualitative and quantitative evaluations of all the 94 test samples. The qualitative evaluations follow the format as Fig.6 of the main paper. The quantitative evaluations show 8 metrics (4 pairs of recall/precision) for each example. Please also refer to the supplementary video illustrating the room-wise coordinate descent. This supplementary document also provides the details of 1) Shortest-path problem reduction; 2) dominant direction approximation; and 3) Containment constraint satisfaction.

1. Shortest path problem reduction

Our objective has three factors: intra-room data term, inter-room consistency term, and model complexity term.
• The data-term $E_{data}(L_i)$ is pixel-wise penalties summed over pixels along the loops, and hence, the reduction to the shortest path cost is straightforward for each loop. More concretely, every corner of a room is shared by two edges, thus contributes half of its cost to one edge:

$$\sum_{p \in \mathbb{C}(e)} \frac{\lambda_1}{2} E_{data}^{\mathcal{C}}(p).$$

The edge and interior penalties are summed over pixels along each edge without any changes:

$$\sum_{p \in \mathbb{E}(e)} \left[\lambda_2 E_{data}^{\mathcal{E}}(p) + \lambda_3 E_{data}^{\mathcal{I}}(p) \right].$$

• The model complexity $E_{model}(L_i)$ is a constant penalized for each edge, which is simply added to the weight of an edge:

$$\lambda_6.$$

• The consistency term $E_{consis}(\mathcal{L})$ is the number of pixels that are used by the corners (or edges) of all the loops. In the room-wise coordinate descent optimization where we fix the loops of all the other rooms, this term can be reduced to the shortest path cost. Without loss of regularity, suppose

we are optimizing L_1. If a pixel p of edge e in L_1 is already used by other rooms, this pixel is imposed penalties regardless of L_i. Therefore, the shortest path problem considers only pixels that are not used by any other rooms:

$$\sum_{p \in \mathbb{C}(e)} \lambda_4(1 - \mathbf{1}_{\mathcal{C}}(p, \mathcal{L} \setminus \{L_1\})) +$$
$$\sum_{p \in \mathbb{E}(e)} \lambda_5(1 - \mathbf{1}_{\mathcal{E}}(p, \mathcal{L} \setminus \{L_1\})).$$

$\mathbb{C}(e)$ is the two pixels at the two end-points of an edge (e). $\mathbb{E}(e)$ is a set of pixels along the edge containing the corners. In our implementation, we obtain $\mathbb{E}(e)$ using Bresenham's line algorithm.

In summary, a single room-wise coordinate descent optimization step is reduced to a shortest path problem, where the weight of an edge is defined as follows.

$$\sum_{p \in \mathbb{C}(e)} \frac{\lambda_1}{2} E_{data}^{\mathcal{C}}(p) \quad +$$
$$\sum_{p \in \mathbb{E}(e)} \left[\lambda_2 E_{data}^{\mathcal{E}}(p) + \lambda_3 E_{data}^{\mathcal{I}}(p) \right] \quad +$$
$$\sum_{p \in \mathbb{C}(e)} \lambda_4(1 - \mathbf{1}_{\mathcal{C}}(p, \mathcal{L} \setminus \{L_1\})) \quad +$$
$$\sum_{p \in \mathbb{E}(e)} \lambda_5(1 - \mathbf{1}_{\mathcal{E}}(p, \mathcal{L} \setminus \{L_1\})) \quad + \quad \lambda_6.$$

2. Dominant direction approximation

Given per-pixel wall direction likelihoods in an increment of 10 degrees, we first extract 4 pairs or orthogonal directions greedily: Repeatedly finding the Manhattan frame whose sum of associated likelihood values are the maximum 4 times. Second, we assign two of the four Manhattan frames to each room: Given a room, based on the wall direction likelihoods for pixels inside the axis-aligned bounding box of the room, we find the top two Manhattan frames,

whose sum of associated direction likelihoods are the maximum. Third, for each (reference) room, we also allow the Manhattan frames of its neighboring rooms to be used in solving the shortest path problem. We define a room to be a neighbor, if its room boundary intersects with the bounding box of the reference room.

3. Containment constraint satisfaction

Identifying the *start-line* and the *start-edge* for each shortest path problem allows us to satisfy the containment constraint. The process involves two steps.

First, we enumerate possible room corners from a corner likelihood map by non-max suppression with a threshold 0.5. We keep only those inside the axis-aligned bounding box of the room under consideration (See Section 5 for the bounding box computation).

Second, we pick the corner (source) with the highest likelihood and find the closest corner (sink) to form a start-edge candidate. After making the edge parallel to the closest dominant direction by moving the sink corner, we check three conditions.

• If the perpendicular bisector of the start-edge hits the room mask (R_i) on one side and does not hit the room mask on the other side.

• The start-edge candidate does not pass through the room mask.

• If more than 90% of the pixels on the start-edge candidate has more than 0.5 edge likelihoods.

If the process fails, we try the next closest sink corner. If all the sink corners fail, we try the source corner with the next highest corner likelihood. We repeat the process until success. We solve for the shortest path that connects the two endpoints of the start-edge while removing all the edges that cross *start-line* to enforce the path to *go around* the room mask.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

80.4/91.1, 84.1/94.6, 76.9/83.3, 23.1/25.0,

72.5/100.0, 68.3/89.6, 53.8/70.0, 0.0/0.0,

70.6/100.0, 66.7/91.3, 53.8/70.0, 0.0/0.0,

70.6/97.3, 69.8/95.7, 53.8/70.0, 0.0/0.0,

100.0/88.2, 100.0/86.4, 100.0/66.7, 50.0/33.3,

86.7/72.2, 68.4/61.9, 50.0/100.0, 0.0/0.0,

100.0/93.8, 100.0/100.0, 100.0/100.0, 100.0/100.0,

100.0/93.8, 100.0/100.0, 100.0/100.0, 100.0/100.0,

70.6/60.0, 63.6/58.3, 80.0/80.0, 60.0/60.0,

70.6/57.1, 72.7/69.6, 60.0/100.0, 0.0/0.0,

76.5/52.0, 81.8/62.1, 60.0/100.0, 40.0/40.0,

88.2/65.2, 86.4/70.4, 100.0/100.0, 100.0/100.0,

88.9/94.1, 82.6/90.5, 83.3/100.0, 50.0/60.0,

94.4/85.0, 87.0/83.3, 83.3/100.0, 50.0/60.0,

94.4/100.0, 87.0/95.2, 83.3/100.0, 50.0/60.0,

94.4/100.0, 87.0/95.2, 83.3/100.0, 50.0/60.0,

67.4/96.9, 65.5/95.0, 75.0/100.0, 25.0/33.3,

60.9/87.5, 58.6/85.0, 33.3/66.7, 0.0/0.0,

84.8/100.0, 79.3/100.0, 75.0/90.0, 16.7/20.0,

82.6/100.0, 81.0/100.0, 75.0/90.0, 16.7/20.0,

92.3/100.0, 84.3/95.6, 83.3/90.9, 25.0/27.3,

74.4/87.9, 78.4/88.9, 50.0/54.5, 16.7/20.0,

87.2/97.1, 84.3/91.5, 91.7/91.7, 41.7/45.5,

87.2/100.0, 84.3/100.0, 83.3/90.9, 25.0/27.3,

Figure 1. Complete qualitative and quantitative evaluations on all the 94 testing examples. Note that FloorNet sometimes fails to produce any reconstruction, in which case, a blank figure is shown. The numbers for each example are recall/precision values for the four metrics (i.e., corner, edge, room, and room++) from left to right and top to bottom.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

8.0/50.0, 7.1/50.0, 25.0/100.0, 0.0/0.0,   44.0/52.4, 42.9/52.2, 75.0/75.0, 0.0/0.0,   56.0/66.7, 53.6/62.5, 25.0/50.0, 0.0/0.0,   68.0/94.4, 64.3/85.7, 50.0/50.0, 0.0/0.0,

86.7/100.0, 84.5/100.0, 91.7/91.7, 66.7/66.7,   73.3/93.6, 69.0/86.0, 25.0/60.0, 0.0/0.0,   66.7/100.0, 66.2/94.0, 83.3/90.9, 41.7/50.0,   70.0/100.0, 66.2/95.9, 58.3/87.5, 8.3/10.0,

44.8/92.9, 38.9/87.5, 28.6/66.7, 0.0/0.0,   82.8/75.0, 75.0/65.9, 14.3/100.0, 0.0/0.0,   65.5/95.0, 66.7/88.9, 42.9/42.9, 14.3/16.7,   72.4/95.5, 69.4/86.2, 42.9/42.9, 14.3/16.7,

21.4/50.0, 5.9/16.7, 25.0/100.0, 0.0/0.0,   92.9/86.7, 94.1/100.0, 50.0/66.7, 0.0/0.0,   92.9/100.0, 94.1/100.0, 50.0/66.7, 25.0/33.3,   92.9/100.0, 94.1/100.0, 50.0/66.7, 25.0/33.3,

70.0/63.6, 58.3/53.8, 80.0/80.0, 40.0/40.0,   85.0/60.7, 87.5/61.8, 20.0/100.0, 0.0/0.0,   80.0/84.2, 79.2/76.0, 100.0/83.3, 60.0/60.0,   70.0/73.7, 54.2/56.5, 100.0/100.0, 80.0/80.0,

39.1/60.0, 45.2/82.4, 25.0/66.7, 0.0/0.0,   87.0/54.1, 83.9/60.5, 12.5/50.0, 0.0/0.0,   95.7/73.3, 96.8/83.3, 87.5/87.5, 37.5/42.9,   91.3/65.6, 90.3/70.0, 87.5/87.5, 37.5/42.9,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

38.9/100.0, 40.9/94.7,
55.6/83.3, 11.1/16.7,

77.8/93.3, 75.0/89.2,
55.6/100.0, 11.1/14.3,

75.0/96.4, 77.3/97.1,
88.9/100.0, 77.8/87.5,

77.8/100.0, 72.7/97.0,
88.9/100.0, 77.8/87.5,

84.6/73.3, 81.2/72.2,
100.0/100.0, 100.0/100.0,

92.3/85.7, 81.2/76.5,
100.0/100.0, 50.0/50.0,

84.6/73.3, 87.5/77.8,
100.0/100.0, 50.0/50.0,

92.3/80.0, 68.8/61.1,
100.0/100.0, 50.0/50.0,

63.6/56.0, 71.4/64.5,
57.1/57.1, 14.3/14.3,

86.4/65.5, 78.6/57.9,
71.4/45.5, 28.6/25.0,

81.8/78.3, 75.0/70.0,
71.4/62.5, 28.6/25.0,

81.8/78.3, 75.0/70.0,
71.4/100.0, 28.6/25.0,

46.7/58.3, 36.8/53.8,
40.0/100.0, 20.0/50.0,

93.3/50.0, 89.5/50.0,
60.0/75.0, 0.0/0.0,

93.3/63.6, 89.5/60.7,
100.0/35.7, 60.0/50.0,

86.7/61.9, 78.9/57.7,
100.0/83.3, 60.0/50.0,

79.5/91.2, 74.5/83.3,
100.0/88.9, 50.0/44.4,

71.8/68.3, 72.3/69.4,
37.5/100.0, 12.5/12.5,

61.5/77.4, 63.8/75.0,
75.0/66.7, 25.0/25.0,

59.0/76.7, 61.7/72.5,
75.0/66.7, 25.0/25.0,

76.6/92.3, 82.1/97.9,
90.0/100.0, 70.0/77.8,

68.1/82.1, 67.9/79.2,
40.0/57.1, 0.0/0.0,

68.1/100.0, 71.4/95.2,
90.0/81.8, 70.0/70.0,

72.3/100.0, 71.4/95.2,
90.0/90.0, 70.0/70.0,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

75.0/80.0, 70.0/77.8, 80.0/100.0, 60.0/75.0,

100.0/76.2, 100.0/80.0, 80.0/80.0, 40.0/40.0,

100.0/94.1, 95.0/90.5, 100.0/100.0, 100.0/100.0,

93.8/83.3, 95.0/86.4, 80.0/80.0, 60.0/60.0,
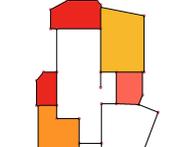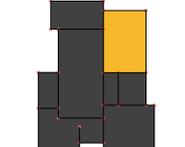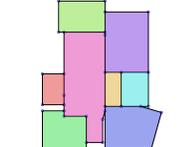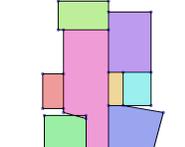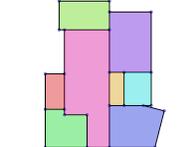
78.8/96.3, 81.0/100.0, 100.0/87.5, 71.4/62.5,

87.9/87.9, 92.9/90.7, 100.0/87.5, 42.9/37.5,

84.8/100.0, 81.0/100.0, 71.4/83.3, 0.0/0.0,

87.9/100.0, 92.9/100.0, 100.0/87.5, 71.4/62.5,
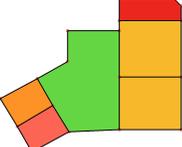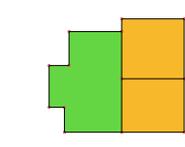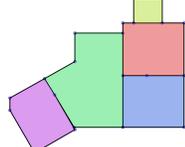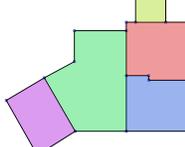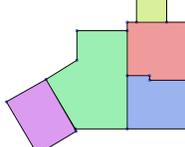
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72.2/68.4, 69.6/69.6, 50.0/60.0, 16.7/20.0,

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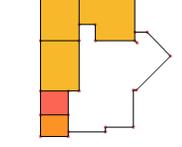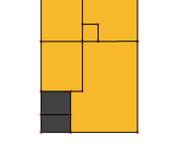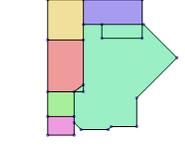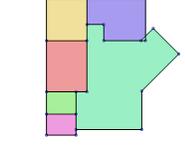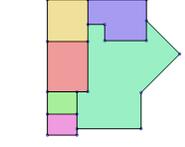
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88.5/100.0, 87.1/100.0, 66.7/100.0, 0.0/0.0,

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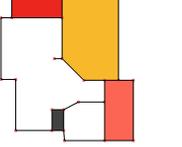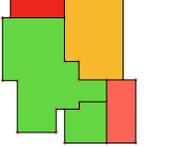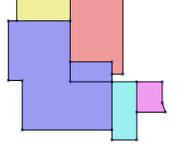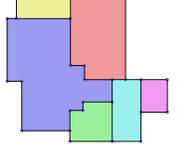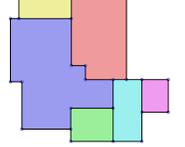
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88.0/84.6, 87.1/84.4, 83.3/83.3, 50.0/50.0,

84.0/84.0, 83.9/83.9, 83.3/83.3, 50.0/50.0,
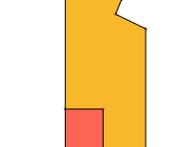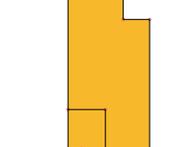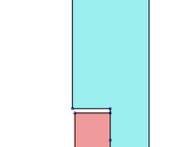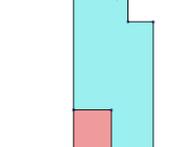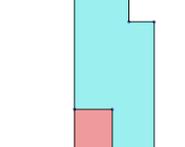
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55.6/50.0, 50.0/45.5, 100.0/100.0, 100.0/100.0,

77.8/63.6, 60.0/50.0, 100.0/100.0, 100.0/100.0,

77.8/77.8, 60.0/60.0, 100.0/100.0, 100.0/100.0,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

45.8/73.3, 46.4/76.5, 60.0/100.0, 20.0/33.3,   83.3/83.3, 82.1/79.3, 100.0/71.4, 60.0/60.0,   75.0/81.8, 71.4/74.1, 60.0/100.0, 0.0/0.0,   79.2/95.0, 78.6/88.0, 100.0/83.3, 100.0/100.0,
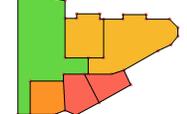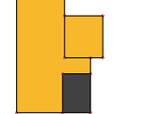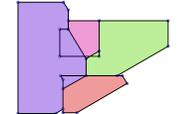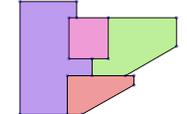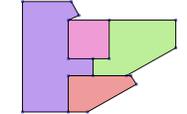
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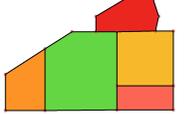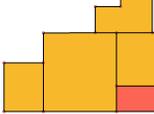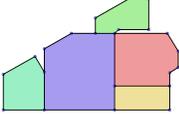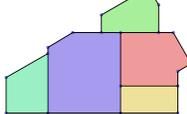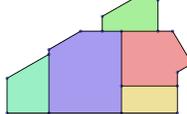
70.6/70.6, 66.7/66.7, 100.0/100.0, 100.0/100.0,   94.1/72.7, 90.5/70.4, 100.0/100.0, 60.0/60.0,   94.1/84.2, 100.0/91.3, 100.0/100.0, 100.0/100.0,   94.1/84.2, 100.0/91.3, 100.0/100.0, 100.0/100.0,
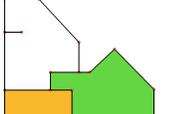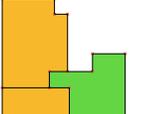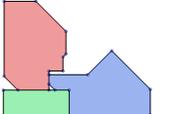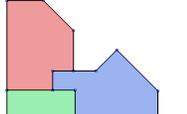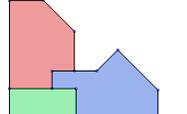
66.7/70.0, 68.0/70.8, 100.0/100.0, 40.0/40.0,   81.0/60.7, 80.0/64.5, 100.0/83.3, 80.0/80.0,   81.0/89.5, 72.0/72.0, 100.0/100.0, 80.0/80.0,   81.0/89.5, 56.0/60.9, 100.0/100.0, 80.0/80.0,
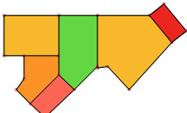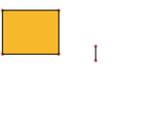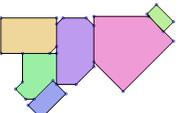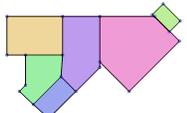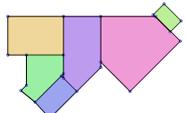
30.0/100.0, 20.0/100.0, 16.7/100.0, 0.0/0.0,   90.0/58.1, 92.0/65.7, 83.3/71.4, 33.3/33.3,   90.0/85.7, 88.0/88.0, 83.3/83.3, 66.7/66.7,   90.0/78.3, 92.0/82.1, 83.3/71.4, 66.7/66.7,
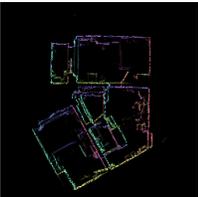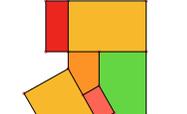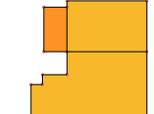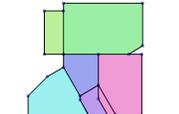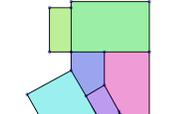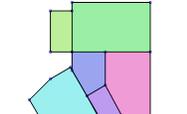
50.0/61.5, 42.9/60.0, 33.3/66.7, 16.7/33.3,   87.5/58.3, 81.0/56.7, 50.0/75.0, 0.0/0.0,   100.0/84.2, 85.7/75.0, 50.0/100.0, 16.7/16.7,   87.5/63.6, 71.4/57.7, 66.7/100.0, 33.3/33.3,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

34.8/72.7, 33.3/76.9, 42.9/100.0, 14.3/33.3, | 65.2/65.2, 60.0/58.1, 57.1/80.0, 0.0/0.0, | 65.2/68.2, 63.3/63.3, 85.7/85.7, 28.6/28.6, | 65.2/68.2, 63.3/65.5, 85.7/85.7, 28.6/28.6,

0.0/0.0, 0.0/0.0, 0.0/0.0, 0.0/0.0, | 54.5/75.0, 58.3/87.5, 50.0/100.0, 0.0/0.0, | 81.8/100.0, 83.3/100.0, 100.0/100.0, 100.0/100.0, | 81.8/100.0, 83.3/100.0, 100.0/100.0, 100.0/100.0,

65.5/100.0, 64.7/95.7, 66.7/80.0, 16.7/20.0, | 75.9/75.9, 70.6/66.7, 66.7/80.0, 0.0/0.0, | 75.9/88.0, 70.6/75.0, 66.7/80.0, 0.0/0.0, | 75.9/91.7, 73.5/80.6, 83.3/71.4, 33.3/28.6,

64.7/55.0, 61.9/59.1, 60.0/100.0, 0.0/0.0, | 88.2/65.2, 85.7/64.3, 60.0/50.0, 0.0/0.0, | 88.2/68.2, 90.5/70.4, 60.0/42.9, 0.0/0.0, | 88.2/71.4, 90.5/73.1, 60.0/42.9, 0.0/0.0,

64.0/88.9, 70.0/91.3, 83.3/83.3, 50.0/50.0, | 96.0/80.0, 100.0/83.3, 50.0/60.0, 0.0/0.0, | 96.0/100.0, 100.0/96.8, 100.0/85.7, 83.3/71.4, | 96.0/100.0, 100.0/100.0, 100.0/85.7, 83.3/71.4,

95.7/95.7, 93.3/90.3, 100.0/88.9, 100.0/88.9, | 91.3/95.5, 90.0/90.0, 87.5/87.5, 75.0/75.0, | 91.3/95.5, 80.0/82.8, 100.0/100.0, 100.0/100.0, | 91.3/95.5, 80.0/82.8, 100.0/100.0, 100.0/100.0,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

57.9/68.8, 60.0/83.3, 42.9/100.0, 14.3/33.3,   73.7/48.3, 72.0/52.9, 28.6/100.0, 0.0/0.0,   89.5/81.0, 88.0/84.6, 42.9/100.0, 14.3/20.0,   84.2/69.6, 76.0/67.9, 42.9/100.0, 14.3/20.0,
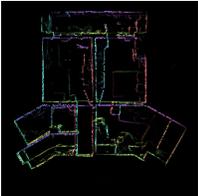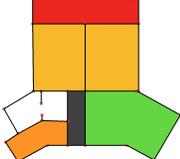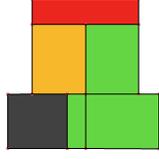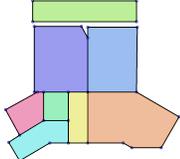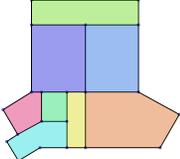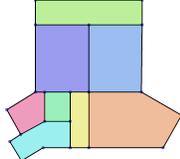
52.0/86.7, 62.5/100.0, 71.4/83.3, 42.9/50.0,   92.0/82.1, 93.8/88.2, 85.7/75.0, 14.3/12.5,   88.0/100.0, 93.8/100.0, 85.7/75.0, 42.9/37.5,   88.0/100.0, 90.6/100.0, 85.7/75.0, 42.9/37.5,
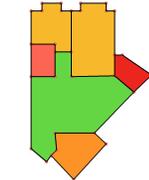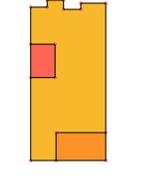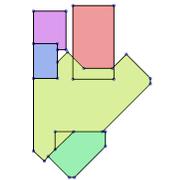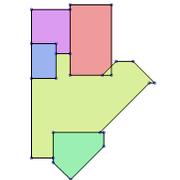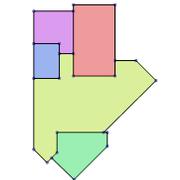
48.4/88.2, 55.6/100.0, 33.3/66.7, 0.0/0.0,   67.7/70.0, 63.9/67.6, 16.7/50.0, 0.0/0.0,   64.5/80.0, 72.2/89.7, 50.0/100.0, 0.0/0.0,   74.2/95.8, 75.0/96.4, 83.3/100.0, 50.0/60.0,
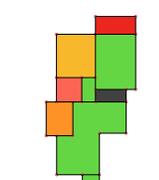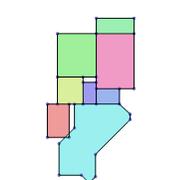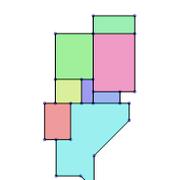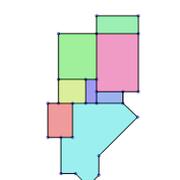
86.8/100.0, 88.9/100.0, 100.0/77.8, 42.9/33.3,   89.5/100.0, 86.7/97.5, 57.1/57.1, 14.3/12.5,   89.5/100.0, 86.7/100.0, 85.7/75.0, 28.6/25.0,   86.8/100.0, 86.7/100.0, 71.4/62.5, 14.3/12.5,
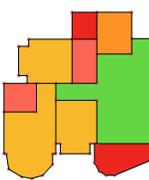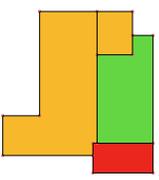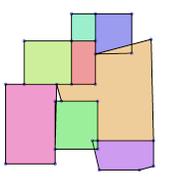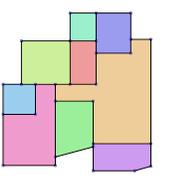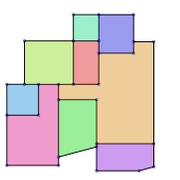
37.0/100.0, 37.0/100.0, 33.3/75.0, 0.0/0.0,   71.7/100.0, 74.1/100.0, 33.3/75.0, 0.0/0.0,   73.9/100.0, 75.9/100.0, 100.0/100.0, 100.0/100.0,   73.9/100.0, 74.1/100.0, 100.0/100.0, 100.0/100.0,
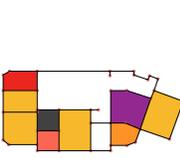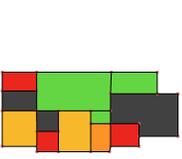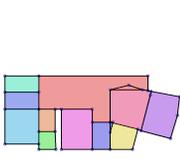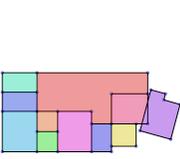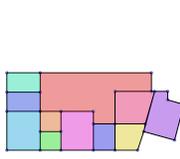
80.0/100.0, 84.6/100.0, 81.8/75.0, 36.4/33.3,   85.0/97.1, 90.4/92.2, 45.5/71.4, 0.0/0.0,   77.5/100.0, 82.7/100.0, 81.8/100.0, 45.5/45.5,   75.0/100.0, 82.7/100.0, 90.9/90.9, 36.4/36.4,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

88.9/100.0, 87.0/100.0, 100.0/100.0, 100.0/100.0,   94.4/94.4, 87.0/90.9, 100.0/100.0, 100.0/100.0,   83.3/93.8, 73.9/85.0, 100.0/100.0, 100.0/100.0,   94.4/100.0, 95.7/100.0, 100.0/100.0, 100.0/100.0,
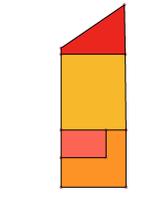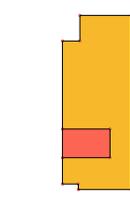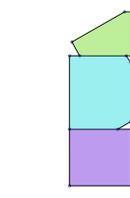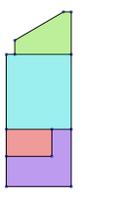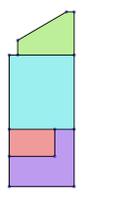
63.6/58.3, 64.3/69.2, 25.0/50.0, 0.0/0.0,   81.8/64.3, 85.7/75.0, 50.0/66.7, 25.0/33.3,   100.0/84.6, 100.0/87.5, 100.0/100.0, 100.0/100.0,   100.0/84.6, 100.0/87.5, 100.0/100.0, 100.0/100.0,
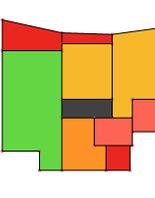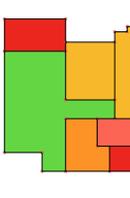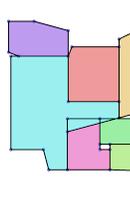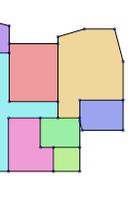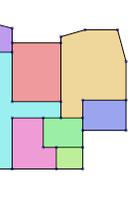
92.9/83.9, 92.1/92.1, 80.0/100.0, 20.0/25.0,   100.0/68.3, 97.4/77.1, 30.0/100.0, 0.0/0.0,   100.0/90.3, 97.4/97.4, 80.0/100.0, 20.0/25.0,   100.0/93.3, 97.4/100.0, 80.0/100.0, 20.0/25.0,
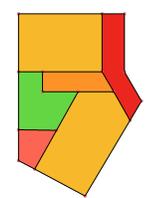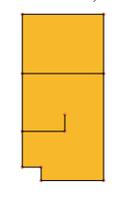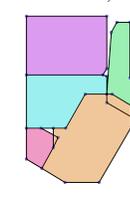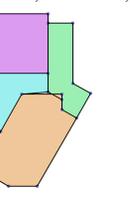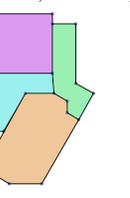
47.1/72.7, 54.5/100.0, 16.7/50.0, 0.0/0.0,   64.7/39.3, 72.7/48.5, 16.7/50.0, 0.0/0.0,   64.7/52.4, 72.7/61.5, 33.3/66.7, 0.0/0.0,   58.8/47.6, 68.2/55.6, 66.7/66.7, 0.0/0.0,
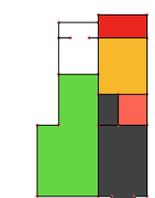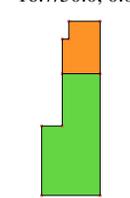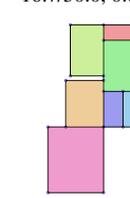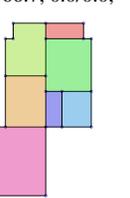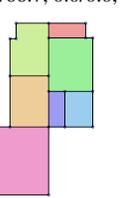
42.3/100.0, 40.6/100.0, 28.6/100.0, 0.0/0.0,   61.5/80.0, 62.5/74.1, 57.1/57.1, 0.0/0.0,   65.4/85.0, 62.5/76.9, 57.1/57.1, 0.0/0.0,   65.4/85.0, 62.5/76.9, 57.1/57.1, 0.0/0.0,
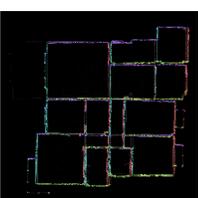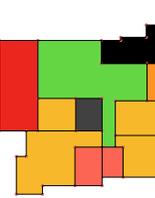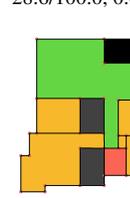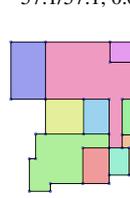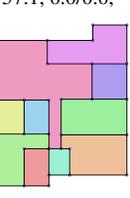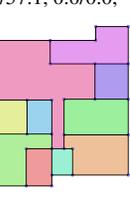
87.2/100.0, 87.7/98.0, 90.9/83.3, 54.5/50.0,   85.1/100.0, 87.7/100.0, 90.9/90.9, 63.6/63.6,   74.5/97.2, 77.2/91.7, 90.9/90.9, 63.6/63.6,   74.5/97.2, 77.2/91.7, 90.9/90.9, 63.6/63.6,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

96.6/100.0, 94.3/100.0, 85.7/100.0, 57.1/66.7, 79.3/95.8, 77.1/93.1, 57.1/100.0, 0.0/0.0, 86.2/96.2, 85.7/93.8, 85.7/100.0, 57.1/66.7, 86.2/96.2, 85.7/96.8, 85.7/100.0, 57.1/66.7,

90.3/100.0, 92.1/100.0, 100.0/88.9, 75.0/66.7, 90.3/100.0, 89.5/94.4, 100.0/88.9, 75.0/66.7, 90.3/100.0, 86.8/94.3, 100.0/88.9, 75.0/66.7, 90.3/100.0, 86.8/97.1, 100.0/88.9, 75.0/66.7,

100.0/100.0, 90.5/100.0, 87.5/100.0, 50.0/57.1, 96.8/100.0, 85.7/100.0, 75.0/85.7, 25.0/28.6, 93.5/100.0, 85.7/100.0, 75.0/85.7, 25.0/28.6, 96.8/100.0, 90.5/100.0, 75.0/85.7, 25.0/28.6,

100.0/96.6, 100.0/89.5, 100.0/70.0, 42.9/30.0, 78.6/88.0, 76.5/81.2, 85.7/85.7, 42.9/42.9, 89.3/96.2, 82.4/87.5, 85.7/85.7, 42.9/42.9, 78.6/95.7, 70.6/80.0, 85.7/85.7, 42.9/42.9,

83.3/100.0, 83.3/100.0, 100.0/100.0, 66.7/66.7, 70.8/85.0, 73.3/81.5, 66.7/66.7, 0.0/0.0, 83.3/100.0, 86.7/96.3, 100.0/100.0, 66.7/66.7, 83.3/100.0, 86.7/96.3, 100.0/100.0, 66.7/66.7,

93.5/100.0, 94.6/100.0, 100.0/85.7, 42.9/42.9, 90.3/100.0, 91.9/100.0, 50.0/60.0, 0.0/0.0, 90.3/100.0, 91.9/100.0, 83.3/71.4, 28.6/28.6, 87.1/100.0, 89.2/100.0, 83.3/71.4, 28.6/28.6,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

| | | 100.0/93.5, 100.0/92.1, 100.0/87.5, 100.0/87.5, | 69.0/71.4, 71.4/71.4, 57.1/80.0, 28.6/28.6, | 96.6/93.3, 94.3/89.2, 85.7/85.7, 28.6/28.6, | 86.2/92.6, 82.9/85.3, 85.7/85.7, 28.6/28.6, |
		67.5/100.0, 72.5/100.0, 81.8/100.0, 45.5/55.6,	67.5/100.0, 74.5/100.0, 27.3/33.3, 0.0/0.0,	60.0/100.0, 68.6/100.0, 63.6/77.8, 9.1/11.1,	65.0/100.0, 72.5/100.0, 63.6/77.8, 9.1/11.1,
		82.8/77.4, 84.2/86.5, 70.0/100.0, 20.0/28.6,	69.0/74.1, 68.4/78.8, 30.0/75.0, 0.0/0.0,	58.6/73.9, 57.9/75.9, 50.0/83.3, 20.0/33.3,	58.6/73.9, 57.9/78.6, 40.0/66.7, 0.0/0.0,
		83.0/100.0, 84.2/100.0, 100.0/91.7, 81.8/75.0,	83.0/100.0, 84.2/98.0, 100.0/91.7, 81.8/81.8,	87.2/100.0, 80.7/90.2, 100.0/100.0, 100.0/100.0,	87.2/100.0, 78.9/100.0, 100.0/100.0, 100.0/100.0,
		100.0/97.4, 100.0/93.9, 100.0/83.3, 60.0/50.0,	81.1/88.2, 78.3/87.8, 70.0/87.5, 10.0/12.5,	94.6/97.2, 95.7/95.7, 100.0/100.0, 100.0/100.0,	100.0/100.0, 100.0/97.9, 100.0/100.0, 100.0/100.0,
		100.0/100.0, 100.0/96.6, 100.0/87.5, 100.0/87.5,	100.0/95.7, 100.0/87.5, 100.0/87.5, 100.0/87.5,	100.0/100.0, 100.0/93.3, 100.0/87.5, 100.0/87.5,	100.0/100.0, 100.0/93.3, 100.0/87.5, 100.0/87.5,
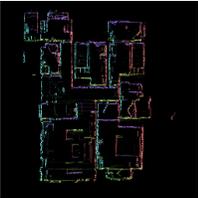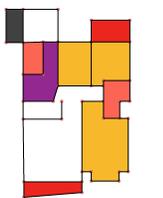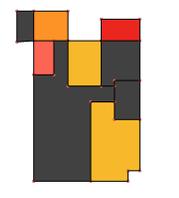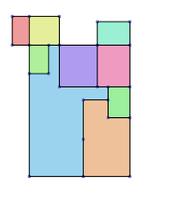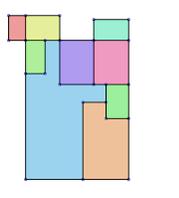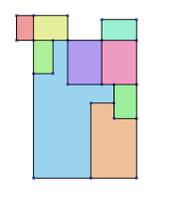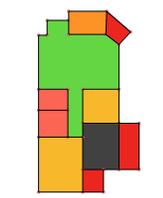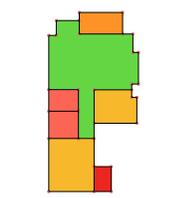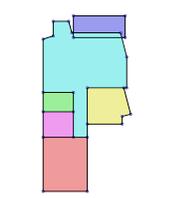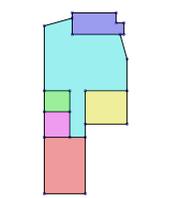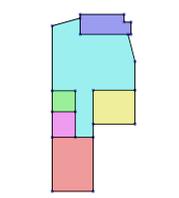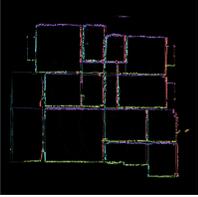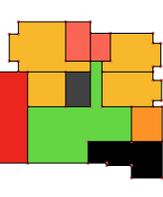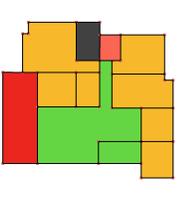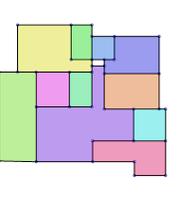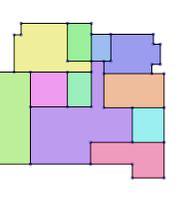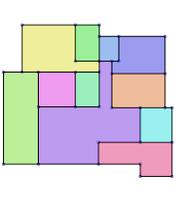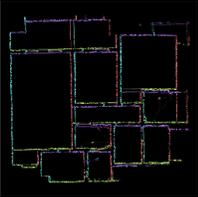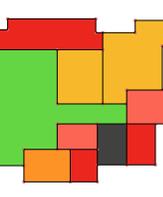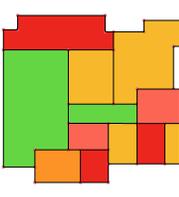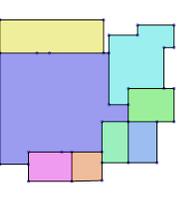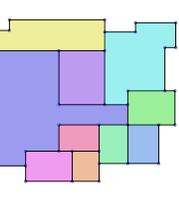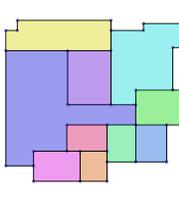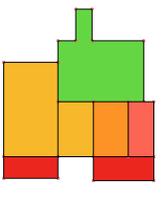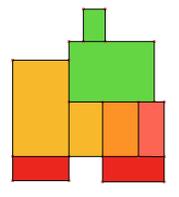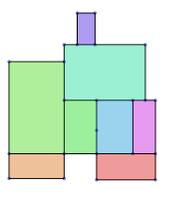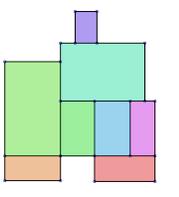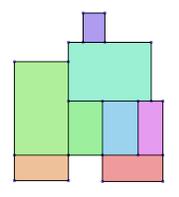
Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours
		83.3/96.8, 81.4/94.6, 87.5/100.0, 62.5/71.4,	88.9/100.0, 83.7/97.3, 100.0/100.0, 62.5/62.5,	80.6/93.5, 79.1/85.0, 100.0/100.0, 100.0/100.0,	66.7/100.0, 69.8/90.9, 100.0/100.0, 100.0/100.0,
		77.8/100.0, 84.4/100.0, 100.0/83.3, 60.0/50.0,	66.7/90.0, 68.8/91.7, 100.0/100.0, 60.0/60.0,	70.4/95.0, 75.0/100.0, 100.0/100.0, 60.0/60.0,	70.4/95.0, 78.1/100.0, 100.0/100.0, 60.0/60.0,
		100.0/94.4, 100.0/91.7, 100.0/85.7, 66.7/57.1,	100.0/73.9, 100.0/73.3, 83.3/100.0, 16.7/14.3,	100.0/94.4, 100.0/84.6, 100.0/85.7, 66.7/57.1,	100.0/94.4, 100.0/88.0, 83.3/71.4, 16.7/14.3,
		100.0/100.0, 100.0/100.0, 100.0/100.0, 100.0/100.0,	100.0/100.0, 100.0/100.0, 100.0/87.5, 71.4/71.4,	100.0/100.0, 100.0/100.0, 100.0/100.0, 100.0/100.0,	100.0/100.0, 100.0/100.0, 100.0/100.0, 100.0/100.0,
		81.8/100.0, 84.6/100.0, 100.0/100.0, 85.7/85.7,	78.8/92.9, 82.1/94.1, 100.0/100.0, 85.7/85.7,	87.9/96.7, 84.6/86.8, 100.0/87.5, 85.7/75.0,	87.9/96.7, 84.6/86.8, 100.0/87.5, 85.7/75.0,
		86.7/96.3, 94.7/100.0, 77.8/87.5, 33.3/37.5,	70.0/72.4, 78.9/83.3, 55.6/83.3, 11.1/12.5,	73.3/91.7, 81.6/100.0, 88.9/100.0, 66.7/75.0,	73.3/91.7, 78.9/96.8, 88.9/100.0, 66.7/75.0,
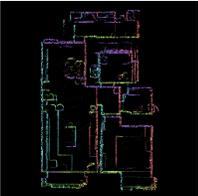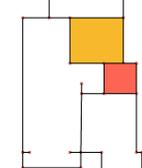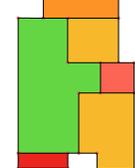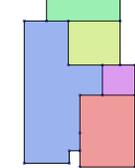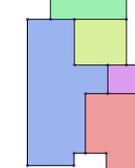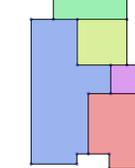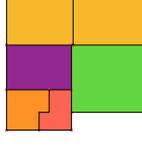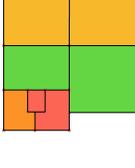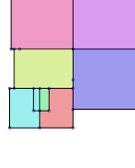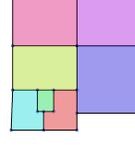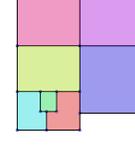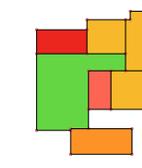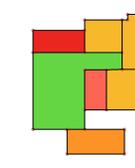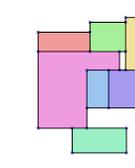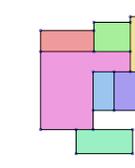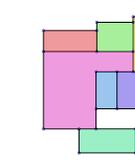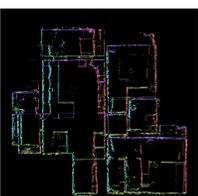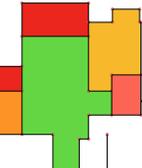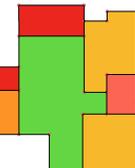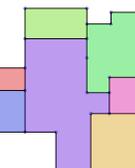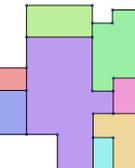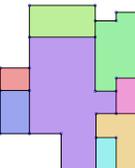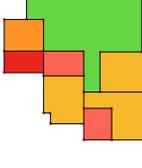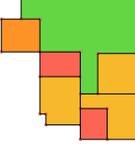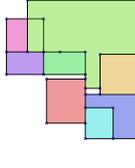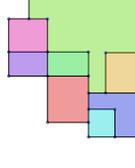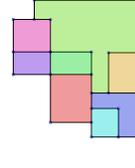
Figure 1. More qualitative and quantitative evaluations.

| | Processed Input | Ground Truth | FloorNet | Ours (w/o E_{data}, E_{consis}) | Ours (w/o E_{consis}) | Ours |

91.7/91.7, 90.0/90.0, 85.7/85.7, 28.6/28.6,

100.0/80.0, 100.0/78.9, 85.7/75.0, 57.1/50.0,

100.0/88.9, 86.7/76.5, 100.0/87.5, 100.0/87.5,

100.0/85.7, 100.0/85.7, 100.0/87.5, 100.0/87.5,
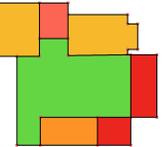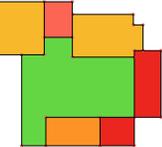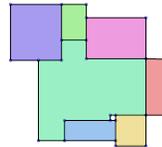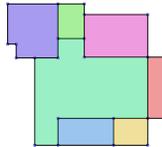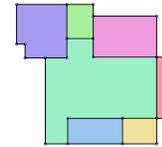
86.7/100.0, 86.1/100.0, 100.0/100.0, 100.0/100.0,

76.7/92.0, 80.6/90.6, 85.7/75.0, 57.1/57.1,

76.7/100.0, 77.8/93.3, 100.0/100.0, 100.0/100.0,

76.7/100.0, 80.6/96.7, 100.0/100.0, 100.0/100.0,
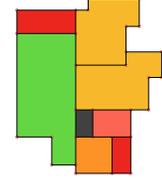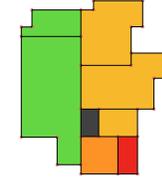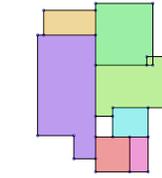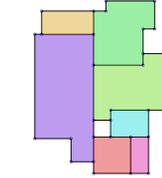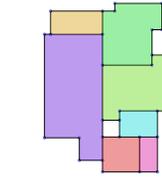
96.7/90.6, 94.6/89.7, 100.0/100.0, 100.0/100.0,

83.3/83.3, 83.8/81.6, 62.5/100.0, 12.5/14.3,

93.3/87.5, 89.2/84.6, 87.5/87.5, 37.5/42.9,

93.3/87.5, 89.2/84.6, 87.5/87.5, 37.5/42.9,
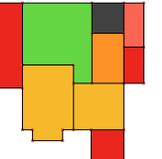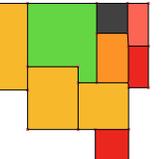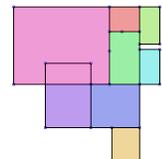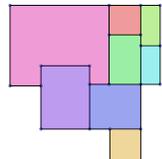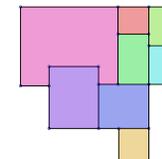
85.2/95.8, 88.6/96.9, 100.0/100.0, 100.0/100.0,

81.5/88.0, 82.9/87.9, 44.4/66.7, 11.1/12.5,

81.5/100.0, 82.9/96.7, 77.8/87.5, 33.3/37.5,

81.5/100.0, 82.9/96.7, 77.8/87.5, 33.3/37.5,
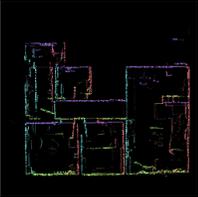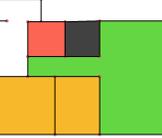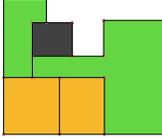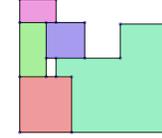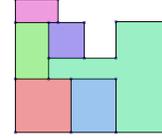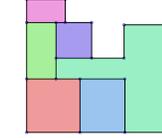
90.0/100.0, 92.0/100.0, 83.3/100.0, 33.3/40.0,

90.0/94.7, 92.0/92.0, 33.3/33.3, 0.0/0.0,

95.0/100.0, 100.0/96.2, 66.7/66.7, 16.7/16.7,

100.0/100.0, 100.0/96.2, 66.7/66.7, 16.7/16.7,
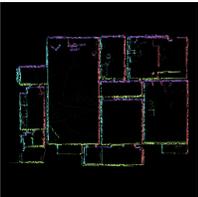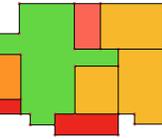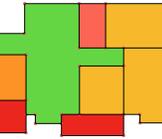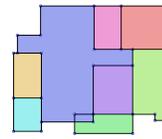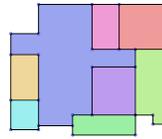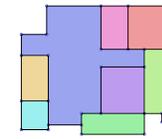
96.6/93.3, 97.2/94.6, 87.5/87.5, 62.5/62.5,

82.8/82.8, 86.1/81.6, 62.5/83.3, 0.0/0.0,

86.2/89.3, 83.3/85.7, 87.5/87.5, 62.5/62.5,

86.2/89.3, 86.1/88.6, 87.5/87.5, 62.5/62.5,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

91.3/95.5, 96.7/96.7, 100.0/77.8, 42.9/33.3,

87.0/90.9, 93.3/90.3, 71.4/62.5, 0.0/0.0,

87.0/100.0, 93.3/96.6, 71.4/62.5, 0.0/0.0,

87.0/100.0, 90.0/93.1, 71.4/62.5, 0.0/0.0,

72.0/85.7, 73.3/88.0, 66.7/80.0, 0.0/0.0,

84.0/72.4, 80.0/66.7, 33.3/50.0, 0.0/0.0,

84.0/77.8, 83.3/73.5, 100.0/75.0, 100.0/75.0,

84.0/75.0, 80.0/68.6, 100.0/75.0, 100.0/75.0,

73.9/100.0, 70.4/97.4, 88.9/88.9, 44.4/44.4,

67.4/91.2, 63.0/79.1, 11.1/16.7, 0.0/0.0,

78.3/100.0, 72.2/88.6, 55.6/62.5, 11.1/10.0,

76.1/100.0, 70.4/86.4, 55.6/62.5, 11.1/10.0,

88.9/94.1, 88.0/95.7, 87.5/100.0, 12.5/14.3,

100.0/81.8, 100.0/83.3, 62.5/55.6, 12.5/12.5,

100.0/90.0, 96.0/82.8, 62.5/62.5, 12.5/12.5,

100.0/90.0, 96.0/82.8, 62.5/62.5, 12.5/12.5,

97.8/100.0, 94.4/100.0, 100.0/90.0, 88.9/80.0,

84.8/100.0, 79.6/100.0, 77.8/77.8, 11.1/11.1,

84.8/100.0, 81.5/97.8, 77.8/63.6, 44.4/40.0,

89.1/100.0, 85.2/100.0, 88.9/80.0, 44.4/40.0,

72.4/100.0, 69.4/100.0, 50.0/100.0, 12.5/25.0,

86.2/96.2, 86.1/91.2, 87.5/87.5, 50.0/50.0,

79.3/85.2, 83.3/88.2, 87.5/87.5, 50.0/50.0,

79.3/82.1, 83.3/85.7, 87.5/87.5, 50.0/50.0,

Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours
		64.9/100.0, 68.9/100.0, 55.6/71.4, 0.0/0.0,	73.0/90.0, 73.3/86.8, 66.7/75.0, 22.2/25.0,	70.3/81.2, 73.3/82.5, 88.9/88.9, 55.6/55.6,	73.0/87.1, 80.0/90.0, 77.8/77.8, 33.3/33.3,
		71.4/95.2, 76.5/100.0, 85.7/100.0, 42.9/50.0,	89.3/80.6, 88.2/81.1, 71.4/62.5, 0.0/0.0,	89.3/86.2, 82.4/73.7, 71.4/55.6, 0.0/0.0,	75.0/77.8, 76.5/72.2, 71.4/55.6, 0.0/0.0,
		100.0/97.4, 97.8/91.7, 100.0/81.8, 77.8/63.6,	94.6/89.7, 95.6/86.0, 88.9/80.0, 77.8/77.8,	89.2/100.0, 86.7/92.9, 88.9/88.9, 44.4/44.4,	89.2/97.1, 86.7/88.6, 100.0/100.0, 100.0/100.0,
		88.9/100.0, 87.9/100.0, 85.7/85.7, 42.9/42.9,	96.3/89.7, 93.9/83.8, 100.0/87.5, 57.1/57.1,	92.6/96.2, 90.9/88.2, 100.0/100.0, 85.7/85.7,	92.6/96.2, 90.9/88.2, 100.0/100.0, 85.7/85.7,
		88.6/100.0, 90.7/100.0, 100.0/87.5, 85.7/75.0,	88.6/100.0, 90.7/100.0, 71.4/62.5, 28.6/25.0,	88.6/100.0, 90.7/100.0, 85.7/75.0, 71.4/62.5,	88.6/100.0, 90.7/100.0, 85.7/75.0, 71.4/62.5,
		0.0/0.0, 0.0/0.0, 0.0/0.0, 0.0/0.0,	95.7/91.7, 92.6/89.3, 60.0/42.9, 0.0/0.0,	91.3/100.0, 92.6/92.6, 80.0/57.1, 20.0/14.3,	95.7/100.0, 96.3/96.3, 80.0/57.1, 20.0/14.3,
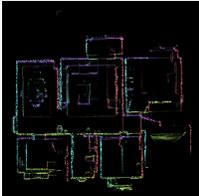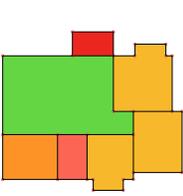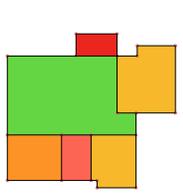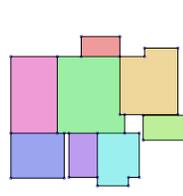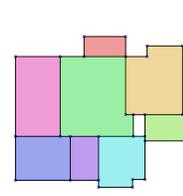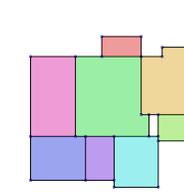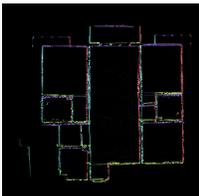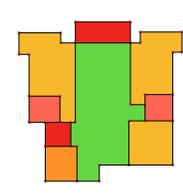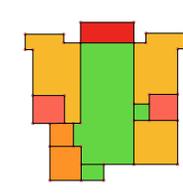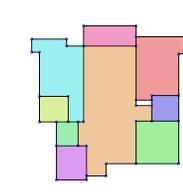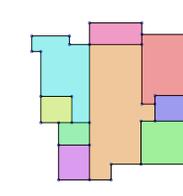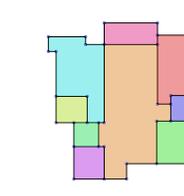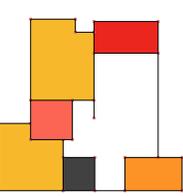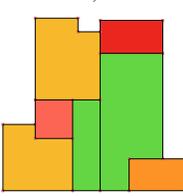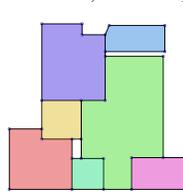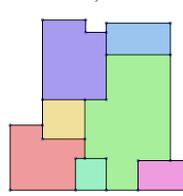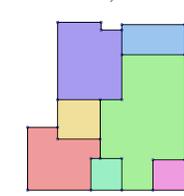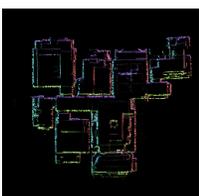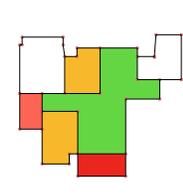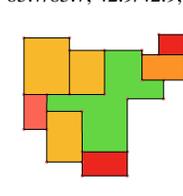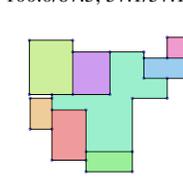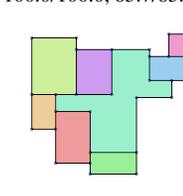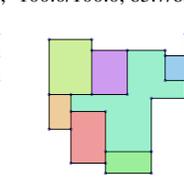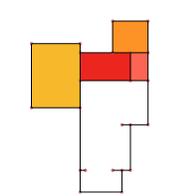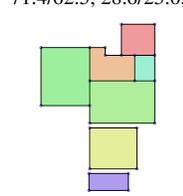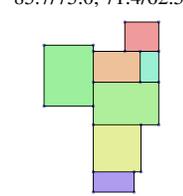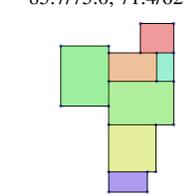
Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours
		90.9/100.0, 92.6/100.0, 100.0/100.0, 66.7/66.7,	100.0/95.7, 100.0/96.4, 83.3/83.3, 33.3/33.3,	81.8/100.0, 77.8/87.5, 83.3/83.3, 33.3/33.3,	81.8/100.0, 77.8/87.5, 83.3/83.3, 33.3/33.3,
		100.0/94.4, 100.0/91.3, 100.0/83.3, 40.0/33.3,	76.5/81.2, 81.0/81.0, 100.0/100.0, 60.0/60.0,	100.0/100.0, 100.0/91.3, 100.0/100.0, 100.0/100.0,	100.0/100.0, 95.2/87.0, 100.0/100.0, 100.0/100.0,
		94.3/100.0, 92.7/100.0, 100.0/100.0, 71.4/71.4,	71.4/100.0, 75.6/100.0, 85.7/85.7, 14.3/14.3,	68.6/100.0, 68.3/96.6, 85.7/85.7, 42.9/42.9,	71.4/100.0, 73.2/100.0, 85.7/85.7, 42.9/42.9,
		100.0/100.0, 98.3/100.0, 100.0/92.3, 83.3/76.9,	60.9/100.0, 63.8/100.0, 16.7/28.6, 0.0/0.0,	82.6/100.0, 79.3/97.9, 75.0/75.0, 41.7/41.7,	84.8/100.0, 86.2/100.0, 75.0/75.0, 41.7/41.7,
		87.5/87.5, 95.0/95.0, 80.0/80.0, 60.0/60.0,	75.0/75.0, 75.0/75.0, 20.0/50.0, 0.0/0.0,	93.8/78.9, 95.0/82.6, 80.0/80.0, 60.0/60.0,	93.8/78.9, 95.0/82.6, 80.0/80.0, 60.0/60.0,
		96.6/100.0, 97.1/100.0, 100.0/100.0, 83.3/83.3,	65.5/86.4, 67.6/85.2, 50.0/100.0, 0.0/0.0,	86.2/100.0, 79.4/93.1, 83.3/100.0, 66.7/80.0,	93.1/100.0, 94.1/100.0, 83.3/100.0, 66.7/80.0,
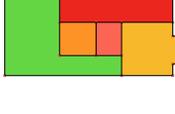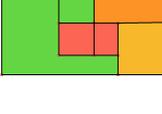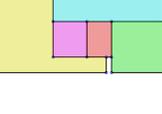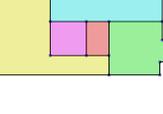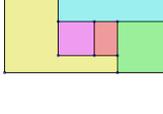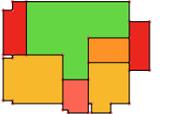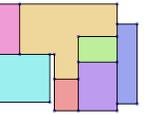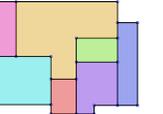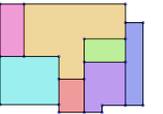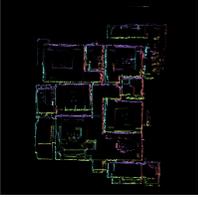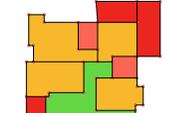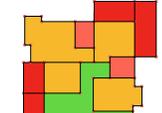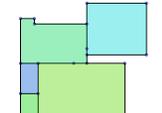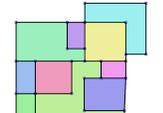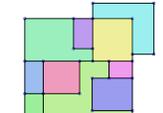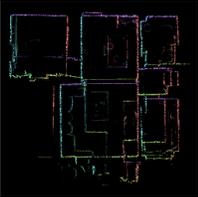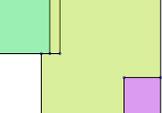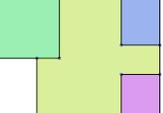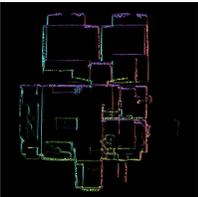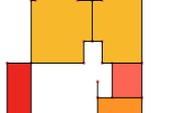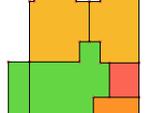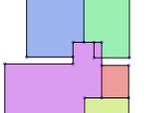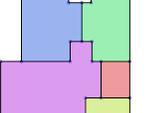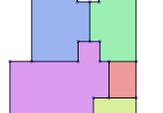
Figure 1. More qualitative and quantitative evaluations.

Processed Input	Ground Truth	FloorNet	Ours (w/o E_{data}, E_{consis})	Ours (w/o E_{consis})	Ours

88.0/73.3, 84.8/75.7, 77.8/87.5, 44.4/50.0,

92.0/85.2, 90.9/88.2, 77.8/87.5, 33.3/37.5,

96.0/82.8, 93.9/83.8, 100.0/100.0, 100.0/100.0,

92.0/85.2, 93.9/88.6, 100.0/100.0, 100.0/100.0,
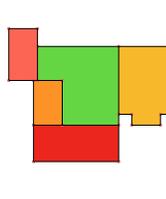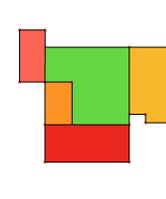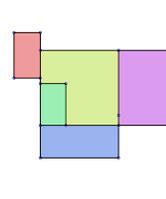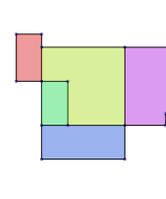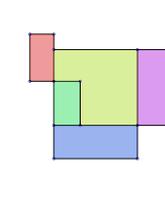
85.0/100.0, 91.7/100.0, 100.0/100.0, 60.0/60.0,

80.0/100.0, 83.3/100.0, 100.0/100.0, 60.0/60.0,

85.0/100.0, 79.2/95.0, 100.0/100.0, 60.0/60.0,

75.0/100.0, 70.8/94.4, 100.0/100.0, 60.0/60.0,
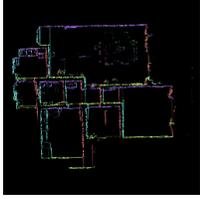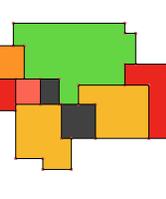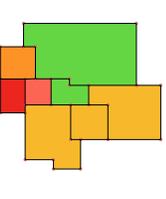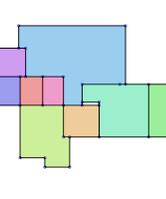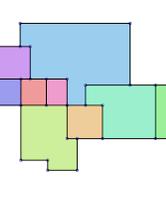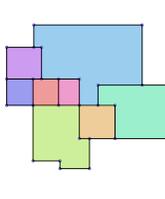
82.9/100.0, 83.7/100.0, 88.9/100.0, 44.4/50.0,

85.7/93.8, 86.0/84.1, 77.8/70.0, 22.2/22.2,

85.7/100.0, 79.1/91.9, 88.9/88.9, 44.4/44.4,

85.7/100.0, 81.4/94.6, 88.9/88.9, 44.4/44.4,
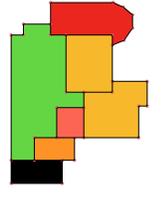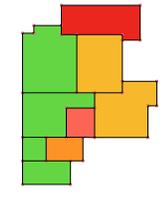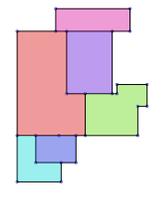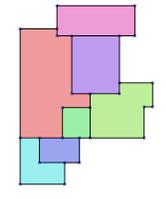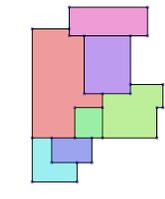
91.2/93.9, 92.5/90.2, 100.0/77.8, 28.6/22.2,

76.5/100.0, 72.5/85.3, 57.1/66.7, 0.0/0.0,

79.4/96.4, 75.0/88.2, 85.7/85.7, 57.1/57.1,

79.4/96.4, 75.0/88.2, 85.7/85.7, 57.1/57.1,

Figure 1. More qualitative and quantitative evaluations.