Supplementary Material of BubbleFormer: Bubble Diagram Generation via Dual Transformer Models

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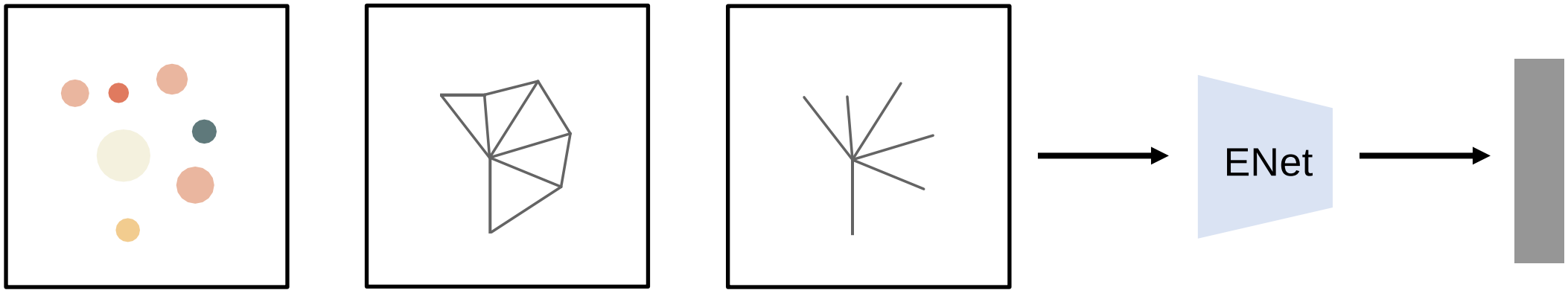
Outline

- Network architecture

- Questionnaire for perceptual studies comparison to GT

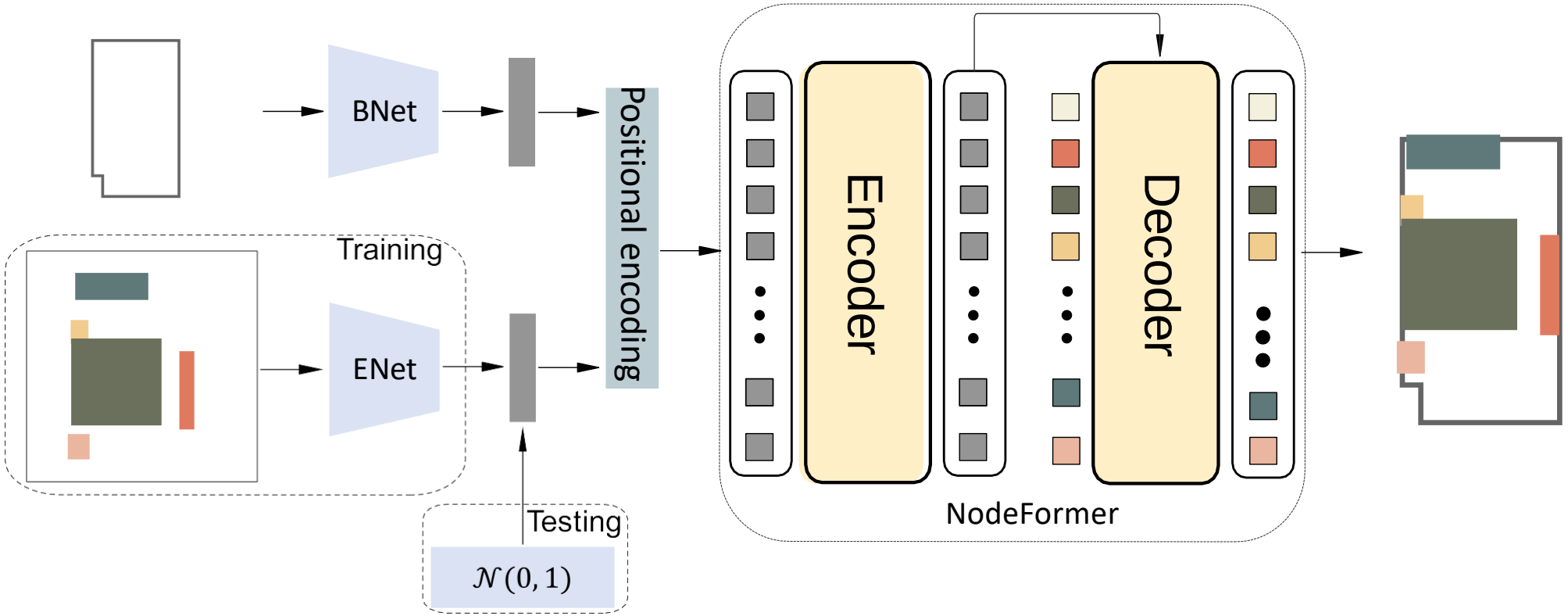
ENet

We adopt the input representation from WallPlan [Sun et al. 2022]. The bubble diagram is visually represented as a raster image. Nodes are represented as circles at their central locations with a certain radius proportional to their space sizes, and we assign pixel values of 1, 2, etc., to different node categories. Connections are visualized as line segments and assigned a pixel value of 2 for edges between the living room node and the other room node and 1 for edges between any two non-living room nodes. An example is shown below.

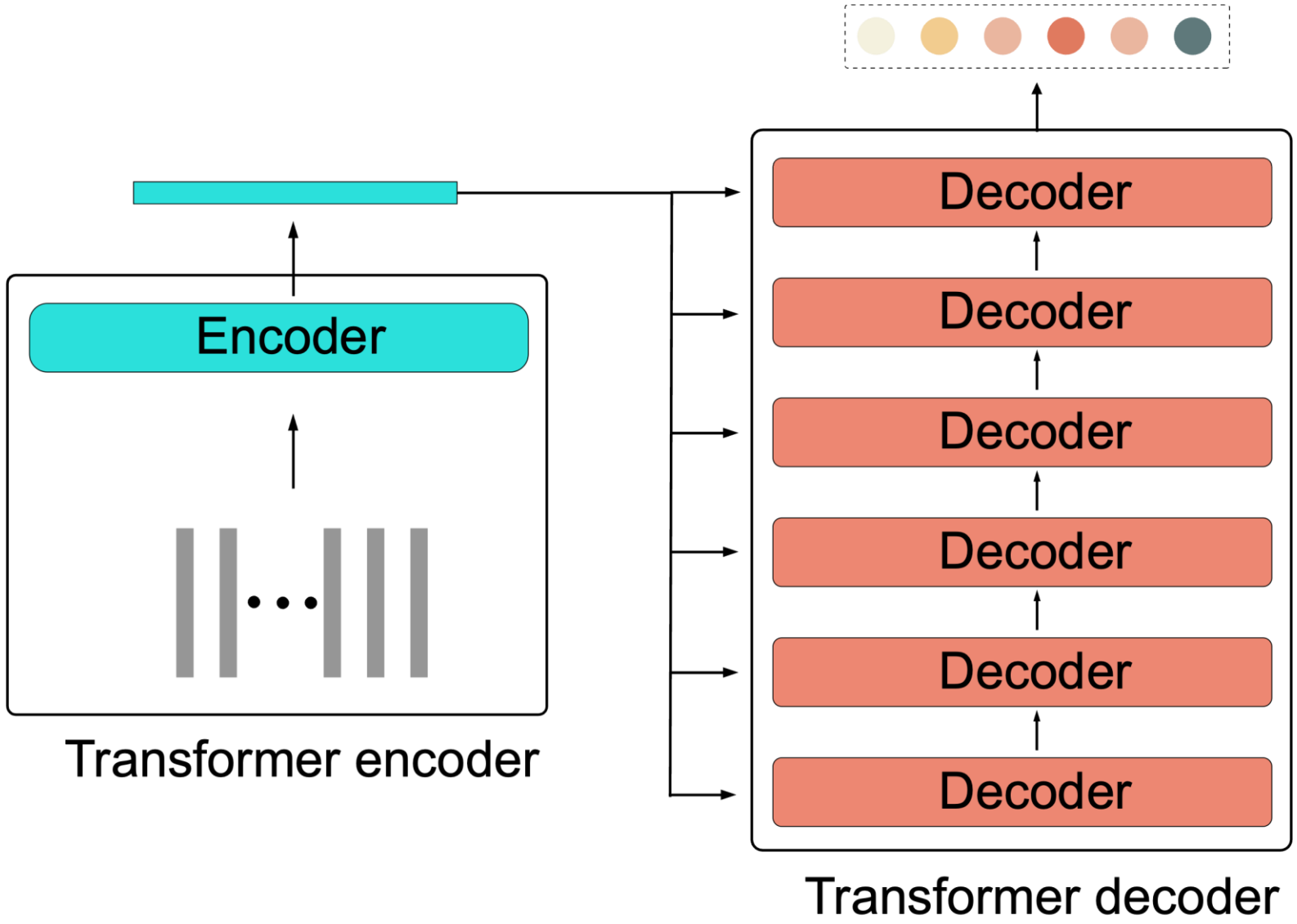


Node mask Connect mask Connect-living-room mask

BubbleFormer for graphic design



Transformer architecture



BNet and Enet architecture

Index	Inputs	Operation	Output Shape
1	-	Multi-channels image	[n,120,120]
2	1	Conv2d(n,64,2)	[64,60,60]
3	2	Batch Normalization	[64,60,60]
4	3	ReLU	[64,60,60]
5	4	Encoder1(2 layers)	[64,30,30]
6	5	Encoder2(2 layers)	[128,30,30]
7	6	Encoder3(2 layers)	[128,30,30]
8	7	Encoder4(2 layers)	[128,30,30]
9	8	Avgpool	[128,30,30]

Encoder module

Module	Index	Inputs	Operation	Output
Input	1	-	Feature map	[64,30,30]
Encoder1	2	1	ResnetBlock(64,64,1)	[64,30,30]
	3	2	ResnetBlock(64,64,1)	[64,30,30]
Encoder2	4	3	ResnetBlock(64,64,1)	[128,30,30]
	5	4	ResnetBlock(64,64,1)	[128,30,30]
Encoder3	6	5	ResnetBlock(64,64,1)	[128,30,30]
	7	6	ResnetBlock(64,64,1)	[128,30,30]
Encoder4	8	7	ResnetBlock(64,64,1)	[128,30,30]
	9	8	ResnetBlock(64,64,1)	[128,30,30]

Hyper parameters

Hyper parameters	**Value**
Batch size	4
Epoch	120
Optimizer	AdamW
Learning rate*	1.5e-4
Weight decay	1e-5

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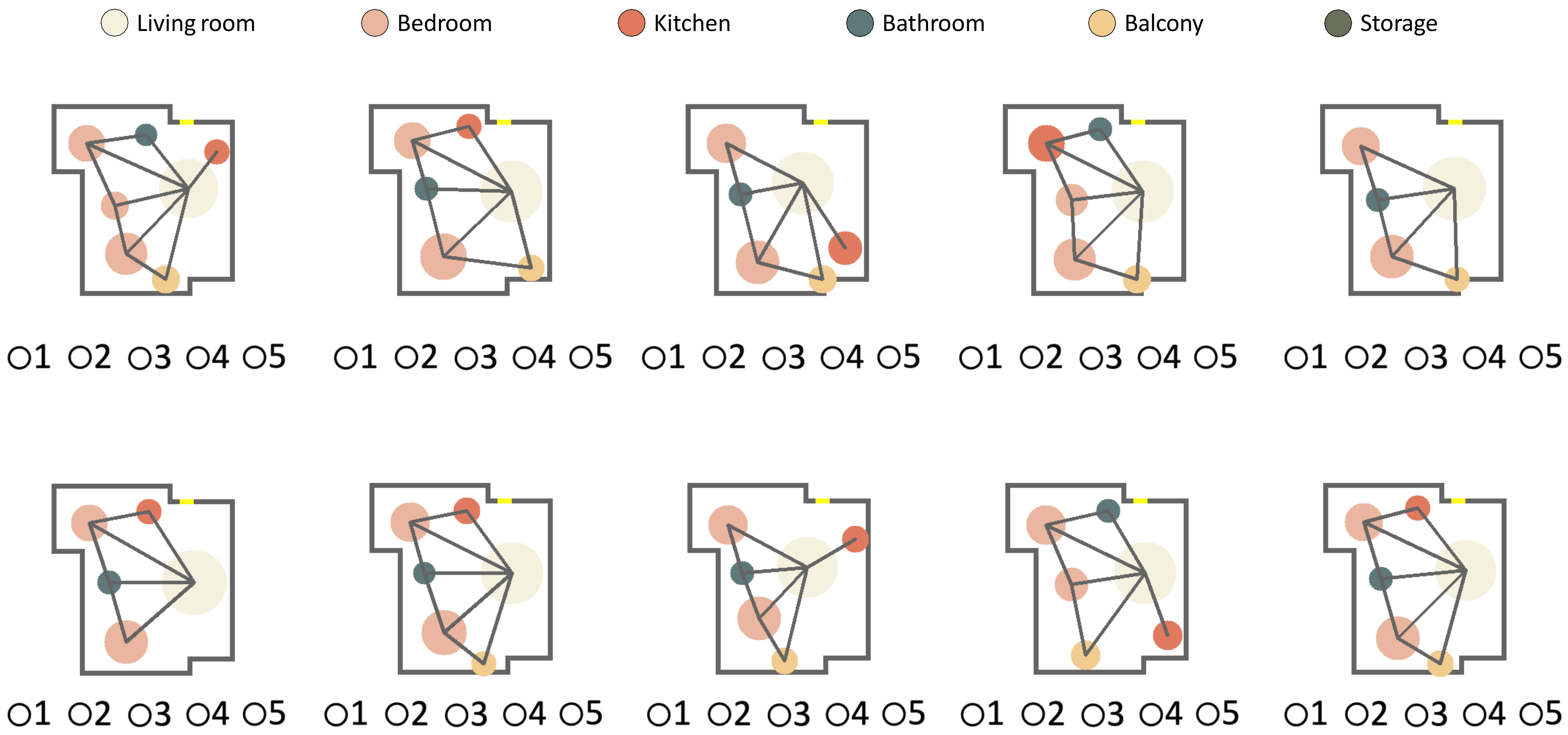
Based on your design experience, rate the bubble diagram under this boundary, with 1 being the lowest and 5 being the highest.


Living room
Bedroom
Kitchen
Bathroom
Balcony
Storage
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5
○1 ○2 ○3 ○4 ○5

Thank you