

Scene	ResNet50 (%)	OTS (%)
Balcony interior	87	<b>89</b>
Bathroom	88	<b>88</b>
Bedroom	87	<b>91.5</b>
Closet	87	<b>88</b>
Dining room	66	<b>82</b>
Garage indoor	86	<b>90</b>
Home office	70	<b>81</b>
Home theater	83	<b>88</b>
Kitchen	70	<b>83</b>
Laundromat	90	<b>92</b>
Living room	60	<b>72</b>
Playroom	86	<b>89</b>
Staircase	<b>93</b>	91
Wet bar	60	<b>73</b>
Total	80.0	<b>85.9</b>

**Table 1.** Comparison of the proposed OTS and ResNet50 on the Places365-14classes.

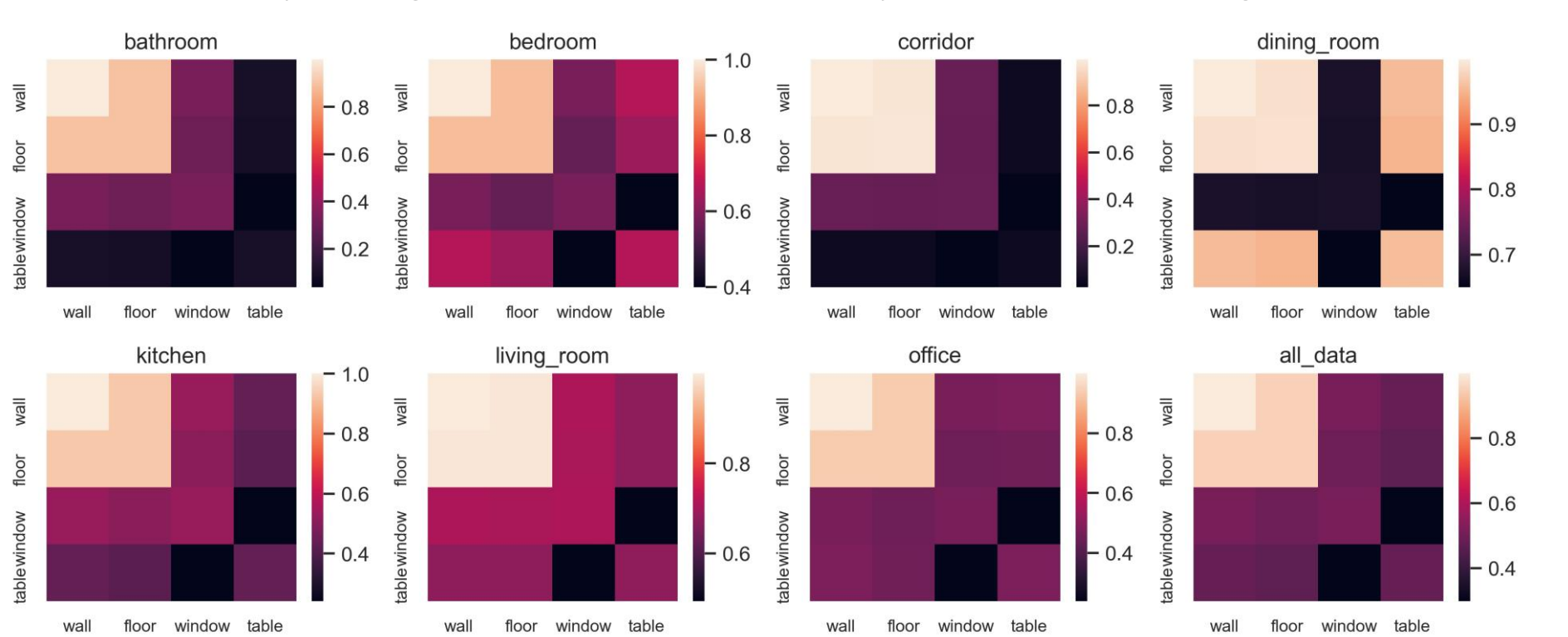
Scene	ResNet50 (%)	[1] (%)	OTS (%)
Bathroom	90	91	<b>93</b>
Bedroom	83	90	<b>98</b>
Corridor	93	<b>96</b>	95
Dining room	73	79	<b>88</b>
Kitchen	84	87	<b>92</b>
Living room	71	80	<b>80</b>
Office	88	<b>94</b>	91
Total	83.1	88.1	<b>91.0</b>

**Table 2.** Comparison of OTS, DEDUCE and ResNet50 on the Places365-7classes.

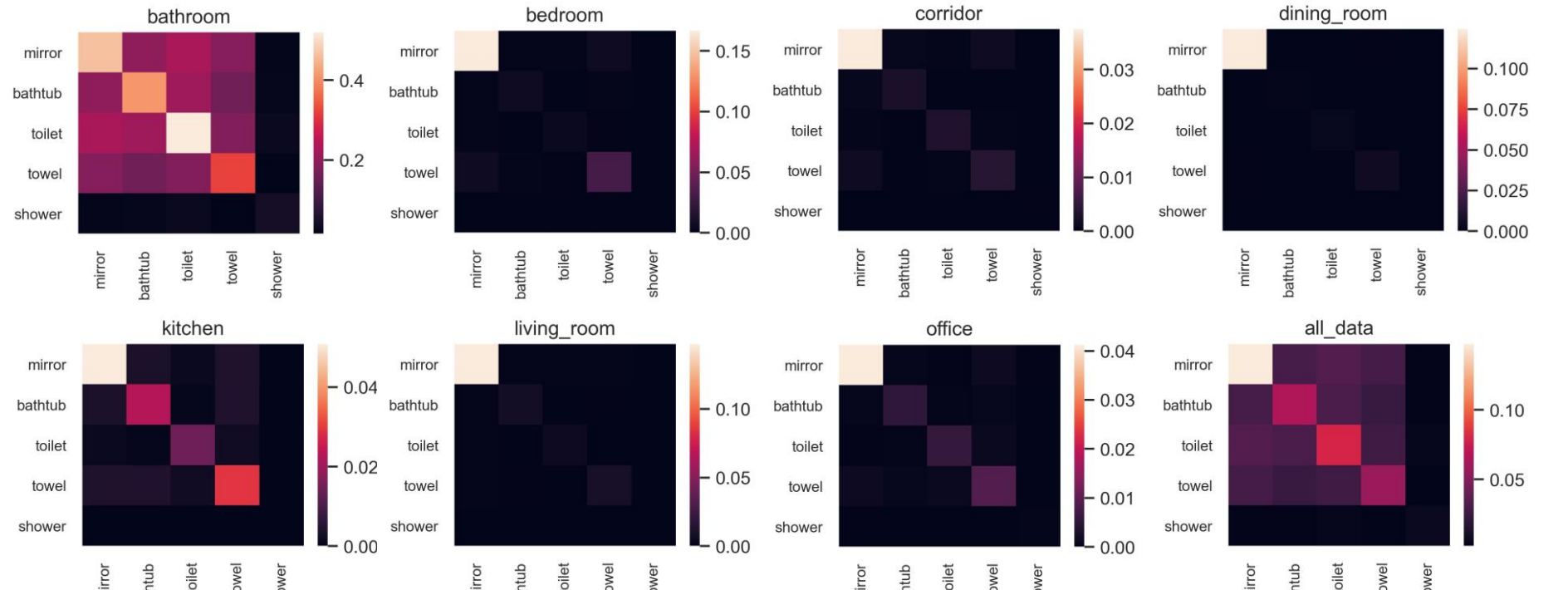
## References

1. Pal, A., et al.: DEDUCE: Diverse scEne Detection methods in Unseen Challenging Environments. IROS, 4198–4204, 2019

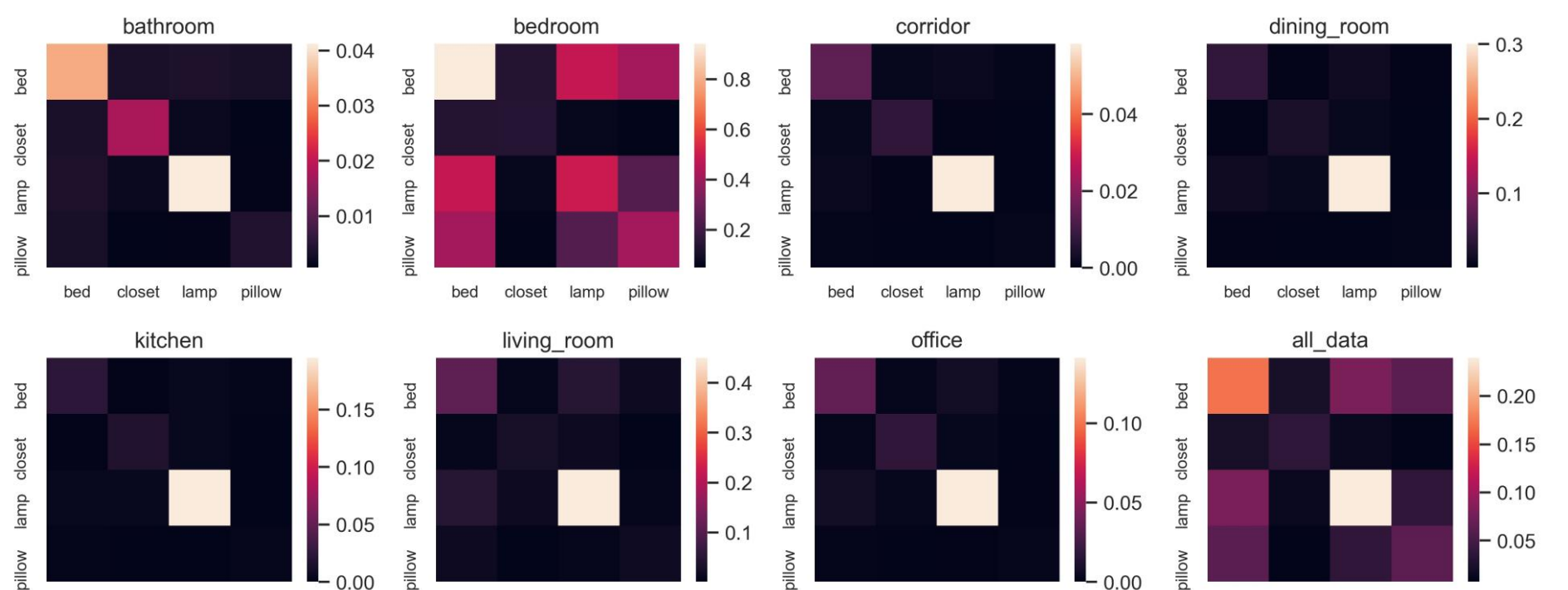
**Figure 1:** Frequency of each object/object pairs in different Scenes. The frequency is calculated by diving number of occurrences by the number of images.



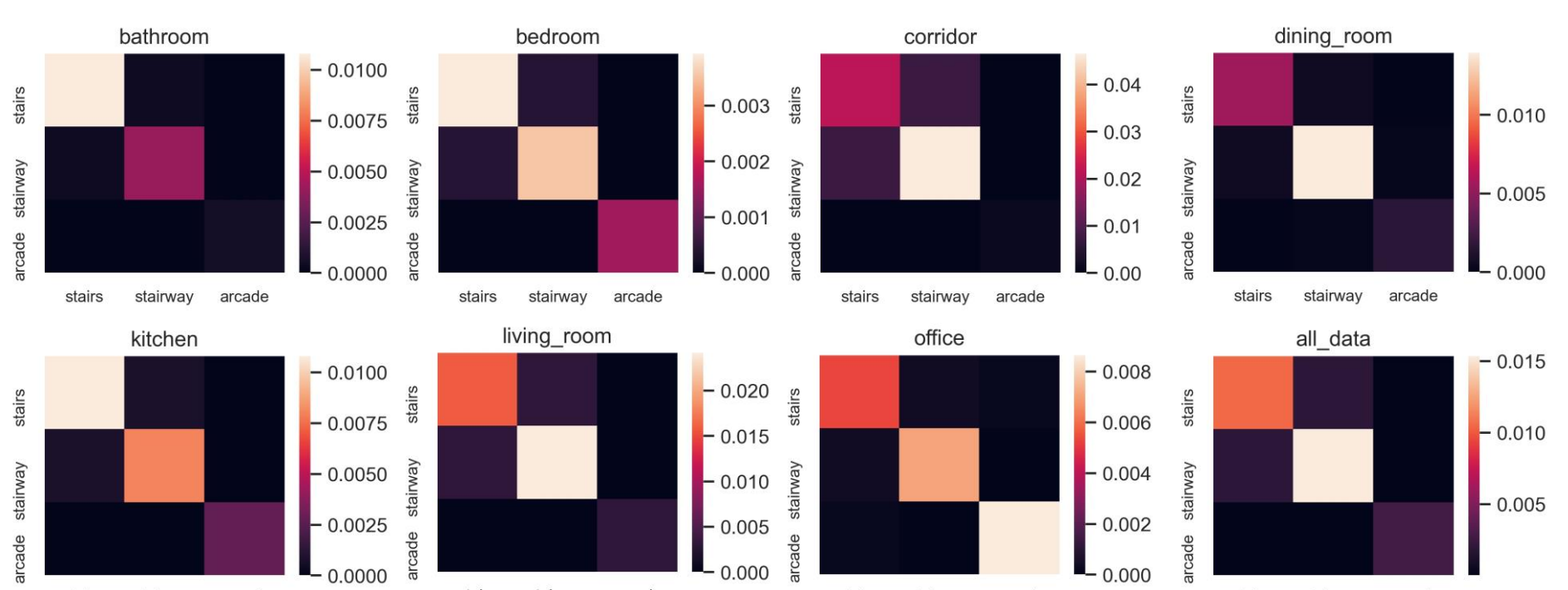
(a) Most frequently appeared object pairs in all scenes



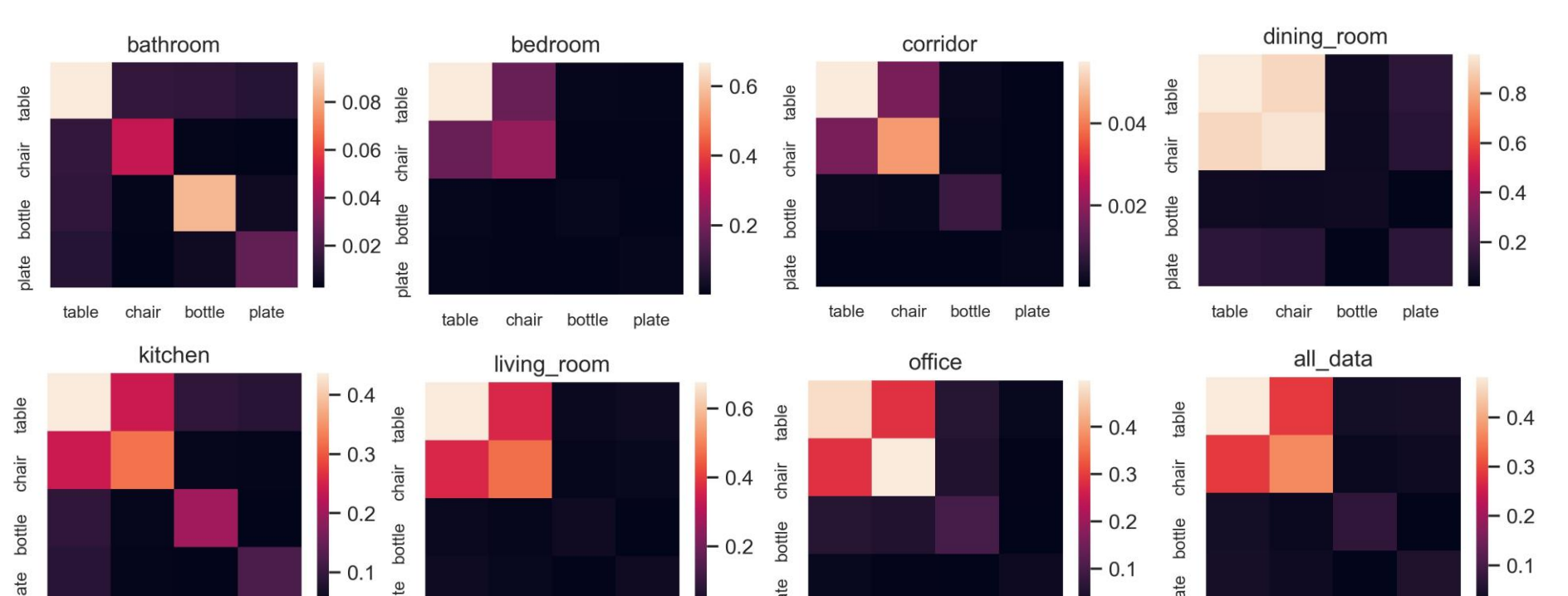
(b) Most frequently appeared object pairs in bathroom



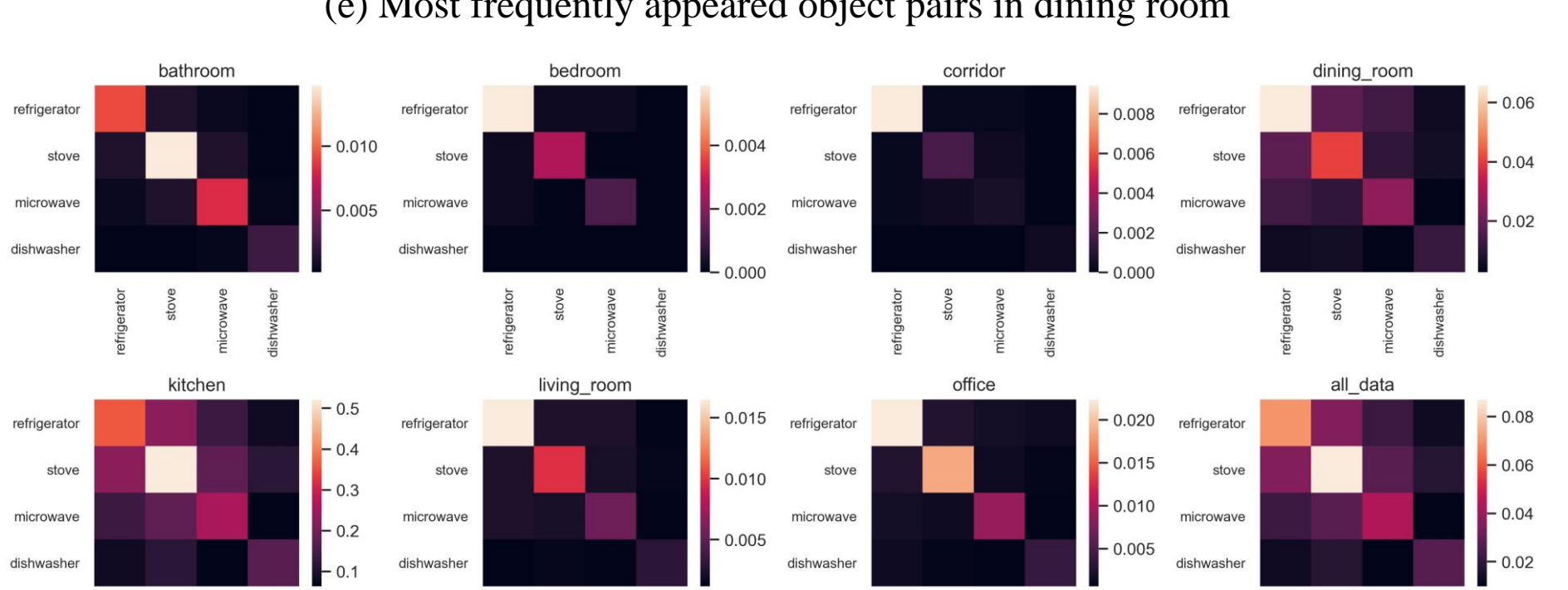
(c) Most frequently appeared object pairs in bedroom



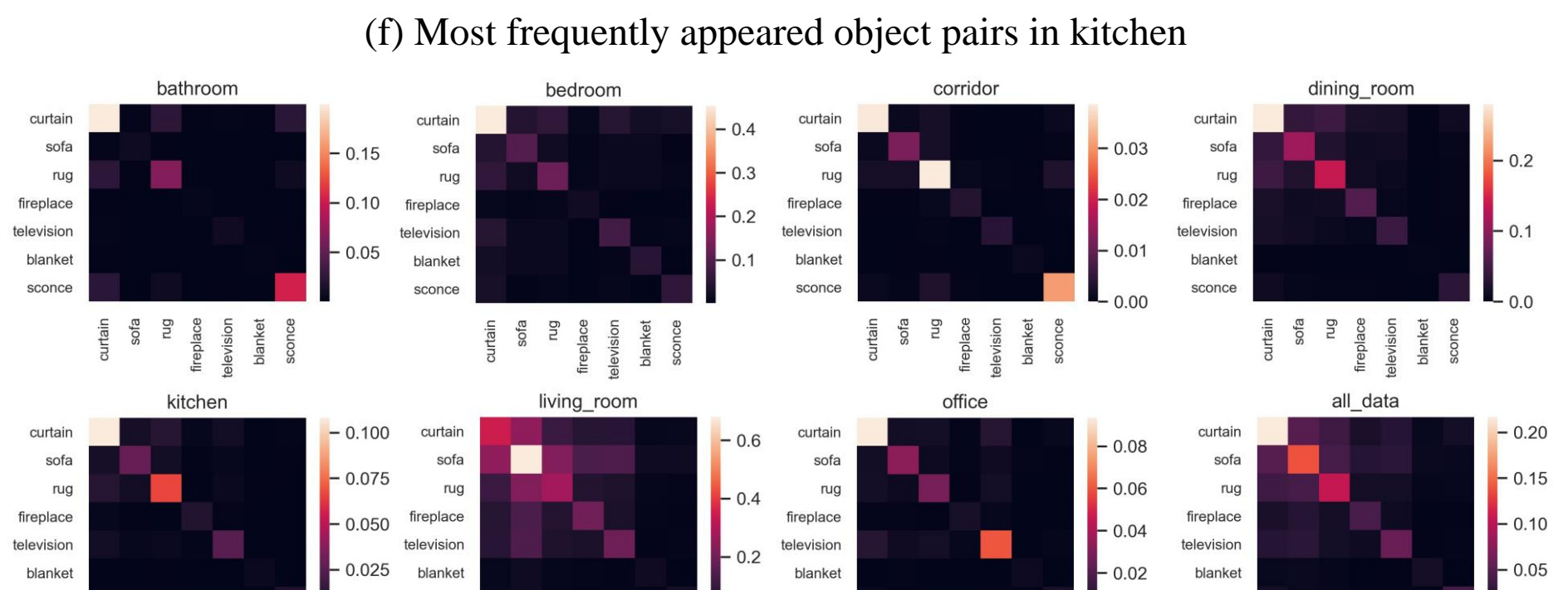
(d) Most frequently appeared object pairs in corridor



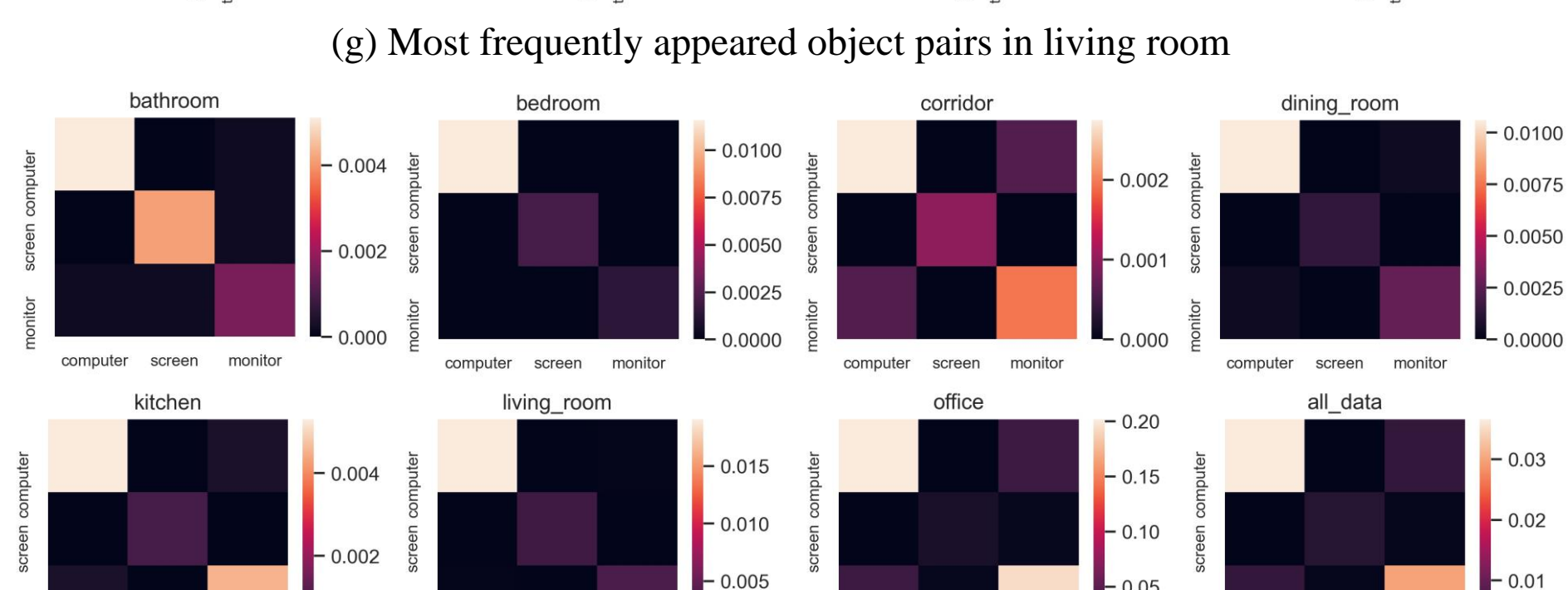
(e) Most frequently appeared object pairs in dining room



(f) Most frequently appeared object pairs in kitchen




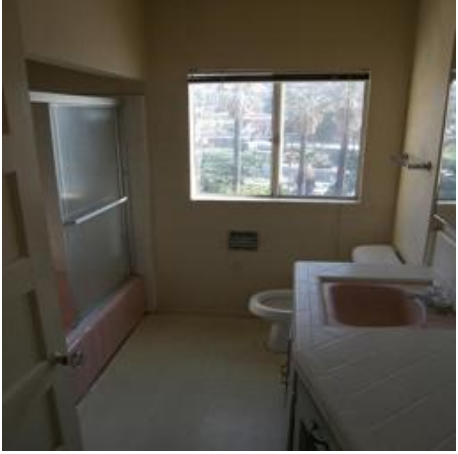














(g) Most frequently appeared object pairs in living room






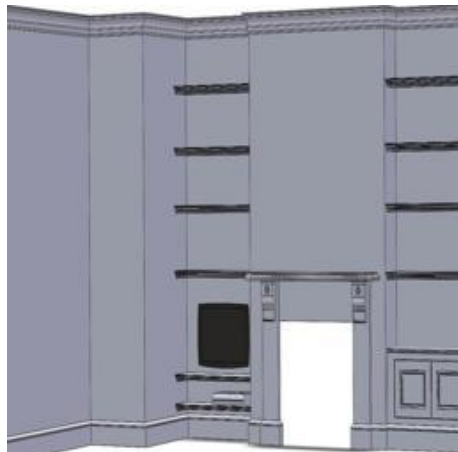

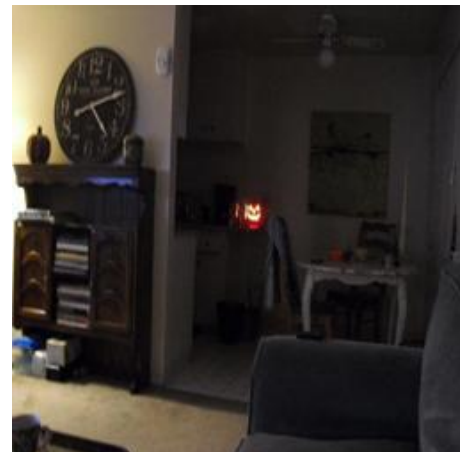

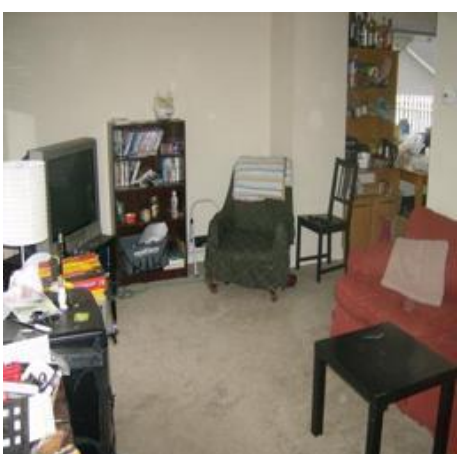




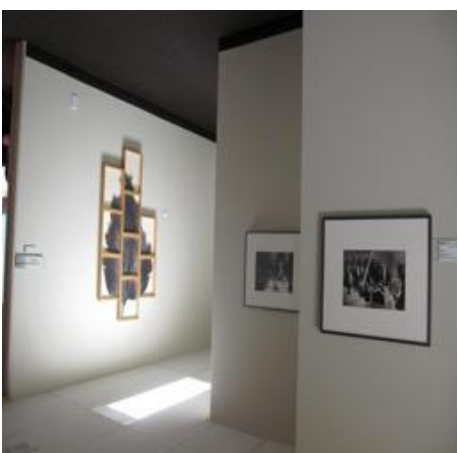



(h) Most frequently appeared object pairs in office



**Figure 2:** Bad case of OTS and ResNet50. (a) Images that ResNet50 misclassified but OTS correctly classified. (b) Images that OTS misclassified but ResNet50 correctly classified.

					
<b>Prediction:</b> Bathroom	Living room	Living room	Bathroom	Kitchen	Bathroom
<b>Ground Truth:</b> Balcony interior	Bathroom	Bedroom	Closet	Corridor	Dining room
					
<b>Prediction:</b> Balcony interior	Living room	Bedroom	Dining room	Wet bar	Office
<b>Ground Truth:</b> Garage room	Home office	Home theater	Kitchen	Laundromat	Living room
					
<b>Prediction:</b> Dining room	Living room	Balcony interior	Kitchen		
<b>Ground Truth:</b> Office	Playroom	Staircase	Wet bar		

(a) Images that ResNet50 misclassified but OTS correctly classified.

					
<b>Prediction:</b> Garage indoor	Office	Living room	Laundromat	Office	Office
<b>Ground Truth:</b> Balcony interior	Bathroom	Bedroom	Closet	Corridor	Dining room
					
<b>Prediction:</b> Kitchen	Living room	Living room	Bathroom	Home theater	Office
<b>Ground Truth:</b> Garage room	Home office	Home theater	Kitchen	Laundromat	Living room
					
<b>Prediction:</b> Corridor	Staircase	Laundromat	Kitchen		
<b>Ground Truth:</b> Office	Playroom	Staircase	Wet bar		

(b) Images that OTS misclassified but ResNet50 correctly classified.