Supplementary Material for WACV 2023 ID 0849 Avoiding Lingering in Learning Active Recognition by Adversarial Disturbance

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Abstract

This document is the supplementary material of our WACV submission with ID 0849. We provide the curves during training, the effect of disturbances, the classifier activations over steps, and the video result on the ShapeNet dataset [1].

1. The derivation of Equation 2

We denote the active recognition agent as $f_{\theta,\phi}$ containing two groups of parameters, *i.e.*, the recognizer and the recognition policy. Recall $\mathcal{P}(.)$ is the projection function from a 3D instance to a 2D image. We have the following loss of a two-step recognition process on the object instance x^i , which is

$$\begin{split} l^{i} &= |y^{i} - f_{\theta,\phi}(x^{i})| \\ &= |y^{i} - \arg\max_{y} \mathbf{P}[y|v_{0}, \mathcal{P}(c_{0} + \arg\max_{a}\pi_{\phi}(a_{1}|v_{0}))]| \\ &= |y^{i} - \arg\max_{y} \frac{\mathbf{P}[y, \mathcal{P}(c_{0} + \arg\max_{a}\pi_{\phi}(a_{1}|v_{0}))|v_{0}]}{\mathbf{P}[\mathcal{P}(c_{0} + \arg\max_{a}\pi_{\phi}(a_{1}|v_{0}))|v_{0}]}| \\ &= |y^{i} - \arg\max_{y} \frac{\mathbf{P}(y, \hat{v}_{a_{1}}|v_{0})}{\mathbf{P}[\arg\max_{a}\pi_{\phi}(a_{1}|v_{0})|v_{0}]}| \\ &= |y^{i} - \arg\max_{y} \frac{q_{\theta}(y, \hat{v}_{a_{1}}|v_{0})}{\pi_{\phi}(a_{1}|v_{0})}|. \end{split}$$

As $q_{\theta}(y, \hat{v}_{a_1}|v_0)$ and $\pi_{\phi}(a_1|v_0)$ are our recognizer and recognition policy, respectively, we factorize the active recognition process into a multiplication of two modules.

2. The curves during training

We here demonstrate the rewards of both the recognition policy and the adversarial policy, the accuracy of the training set, and the accuracy of the validation set in Fig. 1. As the recognizer gets better during training, the recognition policy could obtain rewards about which view benefits the recognition process. On the other hand, the adversarial policy gradually could not find views that the recognizer fails as the training process converges.

During training, the two policies compete with each other on the recognition performance, which forms a zerosum game. The convergence of our method could be comprehended as a Nash equilibrium by the min-max training procedure, *i.e.*, we want to obtain the highest recognition reward as there is no way to increase the reward achieved by the adversarial policy.

3. The effect of disturbances

We provide more examples on the view visiting frequencies during the training of ours and the baseline method [2]. The accuracy of each view is therefore marked on each grid. All heatmaps are normalized independently, *i.e.*, each heatmap covers the full-color range. During the agent exploration, the elevation of view grids is not connected endto-end. In other words, the agent stays at the same position when it attempts to go downwards at the bottom line of the view grid. It explains why the visiting heatmaps of our method are bright at the two ends of elevations.

We could notice that in Fig. 2 (b), the policy collapsed to a monotonous mode. The policy constantly visit views that could provide positive reward as the recognition accuracy of other views are unsatisfactory. We named this phenomenon during training as *lingering* as the agent being reluctant to explore challenging views. On the contrary, the adversarial policy disturbs our agent during training by discovering its current deficiencies. Therefore, with similar training epochs, the proposed method could obtain enough training for each view instead of overfitting to limited views.

4. The classifier activations over steps

We demonstrate the average classifier activations of the correct class at each step in Fig. 3. The increase in classifier activations reflects that the agent could progressively



Figure 1. We show the statistics of one training trial of our method on the ShapeNet dataset [1]. In each training epoch, we sample a T = 5 trajectory on each object instance and then update our model. The accuracy of the validation set stabilizes after about 4000 epochs.

disambiguate its predictions by taking more movements.

5. Ablation studies on auxiliary loss terms

In this section, we study the impact of $\mathcal{L}_{entropy}$ and $\mathcal{L}_{forecast}$ in our loss function. The $\mathcal{L}_{forecast}$ works as approximating the state transition function, which predicts the next-step feature based on the current state. It motivates our model to establish the relation between actions and different views. The $\mathcal{L}_{entropy}$ promotes exploratory behaviors. Table 1 compares the final recognition accuracy over both ShapeNet [1] and SUN360 [3] datasets.

	Datasets/Method	w/o $\mathcal{L}_{forecast}$	w/o $\mathcal{L}_{entropy}$	Ours
	ShapeNet	75.6±.3	75.4±.3	76.4±.3
	SUN360	69.2±.2	69.0±.3	69.6±.2
Tabl	le 1. Ablation stu	idies on the Shap	peNet and SUN	360 datasets

6. The video result on the ShapeNet dataset

More qualitative results of the proposed method on the ShapeNet dataset [1] are included in the demonstrative video. We show the top-3 guesses at each step to show the advantage brought by active recognition.

References

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80.1	83.7	81.2	76.9	82.5	83.6	79.2	82.7	80.6	77.7	82.3	82.0	63.3	74.2	63.5	62.5	67.8	67.4	62.1	71.1	68.9	60.8	72.4 6	8.7	75.2	96.5	97.3	90.7	96.8	94.7 7	5.7 96	.5 97.	5 92.3	96.8	94.7	33.9	41.7	40.0	35.7	34.8	37.4	40.0	36.5	30.4	38.3 4	40.9 35	j.7
78.7	87.6	85.1	82.7	91.2	88.9	82.1	88.9	91.8	86.7	88.6	88.0	77.5	78.6	65.8	60.6	70.7	77.1	71.1	79.4	78.4	72.2	77.1 7	4.4	76.0	96.5	95.5 8	88.3 9	96.5	96.5 7	3.1 93	3 94.	4 91.5	97.1	92.3	68.7	67.0	53.9	62.6	71.3	66.1	60.9	67.8	64.3	62.6	67.8 68	1.7
85.7	90.3	90.7	85.7	91.9	92.9	86.0	94.7	95.0		94.3	91.2	84.3	79.2	73.4	58.8	78.1	81.4	76.1	82.7	87.2	68.0	83.7 8	5.2	66.7	94.7		92.5		92.8 5	8.7 88	.3 90.	95.7	95.5	92.8	87.0	76.5	57.0	65.2	76.5	80.9	82.6	87.8	89.6	88.7 9	93.9 92	2.2
88.3	92.8	91.1	87.9	89.3	90.5	81.4	93.9	95.1	90.1	94.5	93.7	88.2	84.3	72.4	30.7	68.7	74.4	68.7	79.0	72.2	54.8	79.2 8	5.6	54.4		87.2	85.9 1	90.1	82.9 6	0.0 79	.5 93.	96.3	94.1	82.7	81.7	67.8	51.7	55.7	75.7	81.7	86.1	94.8	92.2	91.3 9	92.2 90	.4
93.1	96.6	95.5	93.7	94.6	93.4	83.0	94.3	96.0	95.6	95.9	97.0	89.9	89.5	81.9	68.9	85.6	87.4	84.1	90.1	87.6	77.5	88.7 9	2.8	54.1	96.0	93.6	90.7 9	95.7	95.5 6	5.3 93	.1 96.	95.7	94.4	93.1	86.1	81.7	78.3	70.4	76.5	82.6	86.1	87.8	93.0	91.3 8	87.0 ×	4
88.3	96.5	95.6	92.2	94.4	89.1	80.8	92.1	93.6	94.3	95.2	95.4	86.8	91.3	84.9	84.1	88.0	90.7	88.0	86.2	82.5	75.5	85.4 8	8.0	68.3	96.0	96.0	87.2	95.2	93.9 7	3.3 92	.8 94.	1 91.7	92.8	93.3	81.7	87.0		76.5	80.0	77.4	84.3	86.1	89.6	78.3	76.5 77	1
81.8	89.1	89.6	83.7	90.5	91.4	80.2	90.5	91.5 8	85.4	89.2	90.5	79.6	81.0	83.5	81.0	84.9	86.2	77.9	80.4	84.9	80.8	84.3 8	4.3	72.0	93.9	93.9	90.7 1	92.3	92.3 7	4.4 92	.3 94.	1 88.5	93.9	92.8	63.5	61.7	59.1	61.7	57.4	60.0	62.6	64.3	60.0	53.9	60.0 67	.8
82.6	90.5	92.1	91.8	94.8	95.4	86.0	95.1	95.4	93.1	94.0	90.5	85.8	83.1	79.6	75.9	84.7	91.3	88.2	88.2	87.6	83.1	87.8 9	1.8	75.7	93.3	94.9	91.7 9	96.0	92.8 7	5.2 95	2 96.	84.3	94.9	95.5	82.6	81.7	80.9	77.4	79.1	84.3	84.3	87.0	78.3	72.2	79.1 82	.6
81.5	94.3	94.1	95.3	94.3	96.4	92.3	95.8	94.0	92.5	95.1	92.1	85.4	88.7	89.3	76.7	87.2	89.7	89.1	90.3	85.6	73.6	84.5 8	7.4	67.2	90.9	94.9 (96.0	93.3	92.0 5	8.1 95	.7 94.	9 87.7	94.7	94.4	87.8	88.7	90.4	88.7	89.6	94.8	86.1	85.2	78.3	71.3	84.3 89	.6
81.9	94.0	95.9	94.1	92.1	92.1	90.0	92.2	90.2 8	88.0	89.6	89.6	70.7	79.6	74.8	56.9	78.4	82.5	84.3	85.2	68.7	35.5	70.5 7	5.1	60.3	80.3	92.3	96.8	95.7	82.4 5	3.9 81	.6 88.	8 84.0	92.3	84.0	89.6	92.2	89.6	89.6	92.2	92.2	84.3	76.5	61.7	53.9 8	80.9 83	.5
86.5	93.7	95.3	94.1	93.4	91.7	84.5	89.6	90.5 8	86.9	93.0	89.9	76.9	81.2	86.4	66.2	81.6	86.2	83.5	83.5	74.0	55.9	812 8	0.0	62.1	87.7	91.2 9	96.3 9	96.0	94.4 6	7.5 96	.0 98.	91.7	93.1	94.1	86.1	91.3	88.7	90.4	90.4	88.7	81.7	77.4	62.6	67.0	82.6 81	
87.2	91.4	94.2	90.8	92.2	90.5	82.3	91.3	89.2 8	88.2	93.3	91.8	79.0	83.7	79.2	76.1	81.6	80.8	82.7	82.7	78.6	64.5	80.4 8	1.4	75.2	94.4	95.5 9	93.3 9	97.6	94.1 7	6.8 97	.3 97.	3 90.1	96.8	95.7	71.3	76.5	79.1	79.1	79.1	75.7	75.7	71.3	67.0	70.4 7	78.3 67	.8
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72.2	81.6	85.0	74.4	85.3	83.1	68.8	82.5	85.9	79.7	85.9	87.2	59.9	74.7	71.0	65.3	74.1		53.9	74.1	66.7	67.7		1.7	52.7	61.7	50.6	50.0	67.6	62.2 4	8.9 60	.1 53.	7 47.9	64.9	64.9	59.6	69.6	56.7	52.6		67.8	66.7	66.7	65.5	43.3	73.7 67	1.3
72.2 73.1	81.6 84.4	85.0 83.1	74.4 79.7	85.3 83.1	83.1 81.6	68.8 74.1	82.5 89.1	85.9 93.1 8	79.7 86.9	85.9 91.9	87.2 87.2	59.9 73.1	74.7 76.8	71.0 71.0	65.3 56.9	74.1 71.7	66.7 73.4	53.9 59.3	74.1 70.4	66.7 69.7	67.7 63.0	72.1 7 74.4 7	5.8	52.7 63.3	61.7 87.2	50.6 5 55.1 6	50.0 (51.2 (67.6 84.0	62.2 4 89.4 7	8.9 60 1.8 88	.1 53. .3 84.	7 47.9 0 59.6	64.9 81.9	64.9 85.1	59.6 74.9	69.6 85.4	56.7 78.9	52.6 59.6	70.2 73.7	67.8 76.0	66.7 70.8	66.7 78.4	65.5 80.7	43.3 71.9 8	73.7 67 83.6 85	.3 .4
72.2 73.1 76.9	84.4 84.4	85.0 83.1 84.4	74.4 79.7 76.2	85.3 83.1 75.9	83.1 81.6 77.2	68.8 74.1 62.5	82.5 89.1 86.9	85.9 93.1 92.2	79.7 86.9 94.4	85.9 91.9 91.9	87.2 87.2 92.5	59.9 73.1 85.2	74.7 76.8 80.5	71.0 71.0 75.1	65.3 56.9 49.5	74.1 71.7 75.1	66.7 73.4 83.2	53.9 59.3 80.8	74.1 70.4 81.8	66.7 69.7 79.5	67.7 63.0 57.9	72.1 7 74.4 7 79.8 8	1.7 S 5.8 G 5.9 T	52.7 63.3 70.2	61.7 87.2 89.4	50.6 5 55.1 (59.4 5	50.0 61.2 54.8	67.6 84.0 92.6	62.2 4 89.4 7 88.8 7	8.9 60 1.8 88 6.6 92	.1 53. .3 84. .6 92.	7 47.9 0 59.6 72.9	64.9 81.9 94.7	64.9 85.1 89.9	59.6 74.9 78.4	69.6 85.4 77.8	56.7 78.9 75.4	52.6 59.6 60.8	70.2 73.7 64.3	67.8 76.0 79.5	66.7 70.8 76.6	66.7 78.4 88.9	65.5 80.7 78.4	43.3 71.9 8 62.6 8	73.7 67 83.6 85 68.9 86	.3 .4 .3
72.2 73.1 76.9 46.2	81.6 84.4 81.6 51.2	85.0 83.1 84.4 52.8	74.4 79.7 76.2 44.4	85.3 83.1 75.9 58.4	83.1 81.6 77.2 57.2	68.8 74.1 62.5 36.2	82.5 89.1 86.9 76.2	85.9 93.1 92.2 91.6	79.7 86.9 94.4 91.6	85.9 91.9 91.9 91.2	87.2 87.2 92.5 84.4	59.9 73.1 85.2 79.1	74.7 76.8 80.5 78.1	71.0 71.0 75.1 64.6	65.3 56.9 49.5 24.6	74.1 71.7 75.1 64.0	66.7 73.4 83.2 78.1	53.9 59.3 80.8 80.8	74.1 70.4 81.8 80.5	66.7 69.7 79.5 66.0	67.7 63.0 57.9 32.0	72.1 7 74.4 7 79.8 8 73.4 7	5.8 5.9 1 5.9 1 5.1 1	52.7 63.3 70.2 76.6	61.7 67.2 69.4 65.1	50.6 3 55.1 6 59.4 5 55.1 4	50.0 (61.2 (54.8) 46.3 (67.6 84.0 92.6 84.0	62.2 4 89.4 7 88.8 7 85.1 7	8.9 60 1.8 88 6.6 92 7.1 91	.1 53. 13 84. 16 92. .5 87.	7 47.9 0 59.6 5 72.9 2 65.4	64.9 81.9 94.7 88.3	64.9 85.1 89.9 91.0	59.6 74.9 78.4 59.1	69.6 (85.4 (77.8 (69.0 (56.7 78.9 75.4 55.5	52.6 59.6 60.8 38.0	70.2 73.7 64.3 65.5	67.8 76.0 79.5 71.9	66.7 70.8 76.6 72.5	66.7 78.4 68.9 75.4	65.5 80.7 78.4 71.9	43.3 1 71.9 8 62.6 8 58.5 7	73.7 67 83.6 85 88.9 88 74.9 82	7.3 .4 .3 .5
72.2 73.1 76.9 46.2 73.8	84.4 84.4 81.6 51.2 88.1	85.0 83.1 84.4 52.8 84.4	74.4 79.7 76.2 44.4 75.9	85.3 83.1 75.9 58.4 82.8	83.1 81.6 77.2 57.2 83.1	68.8 74.1 62.5 36.2 74.7	82.5 89.1 86.9 76.2 87.8	85.9 93.1 92.2 91.6 95.9	79.7 86.9 94.4 91.6 95.0	85.9 91.9 91.9 91.2 91.2	87.2 87.2 92.5 84.4 95.0	59.9 73.1 85.2 79.1 90.6	74.7 76.8 80.5 78.1 81.1	71.0 71.0 75.1 64.6 78.1	65.3 56.9 49.5 24.6 62.3	74.1 71.7 75.1 64.0 79.1	66.7 73.4 83.2 78.1 83.5	53.9 59.3 80.8 80.8 83.5	74.1 70.4 81.8 80.5 86.5	66.7 69.7 79.5 66.0 81.8	67.7 63.0 57.9 32.0 65.0	72.1 7 74.4 7 79.8 8 73.4 7 84.2 8	1.7 3 5.8 6 5.9 1 5.1 1 4.5 1	52.7 63.3 70.2 76.6 73.4	61.7 67.2 89.4 65.1 92.6	50.6 3 55.1 6 55.1 4 55.1 4 55.1 4	50.0 6 51.2 8 54.8 9 46.3 9 58.0 4	67.6 84.0 92.6 54.0 87.2	62.2 4 89.4 7 88.8 7 85.1 7 86.7 7	8.9 60 1.8 88 6.6 92 7.1 91 5.5 91	.1 53. 13 84. 16 92. 15 87. 10 88.	7 47.9 0 59.6 5 72.9 2 65.4 3 68.1	64.9 81.9 94.7 88.3 96.3	64.9 85.1 89.9 91.0 96.3	59.6 74.9 78.4 59.1 86.5	69.6 (85.4 (77.8 (69.0 (91.8 (55.5 53.6	52.6 59.6 60.8 38.0 77.2	70.2 73.7 64.3 65.5 93.6	67.8 76.0 79.5 71.9 91.8	66.7 70.8 76.6 72.5 90.6	66.7 78.4 88.9 75.4 93.6	65.5 80.7 78.4 71.9 93.6	43.3 2 71.9 8 62.6 8 58.5 7 78.9 8	73.7 67 83.6 85 88.9 88 74.9 82 88.9 93	7.3 1.3 1.5 1.6
72.2 73.1 76.9 46.2 73.8 82.8	81.6 84.4 81.6 51.2 88.1 92.5	85.0 83.1 84.4 52.8 84.4 92.2	74.4 79.7 76.2 44.4 75.9 79.4	85.3 83.1 75.9 58.4 82.8 88.8	83.1 81.6 77.2 57.2 83.1 88.8	68.8 74.1 62.5 36.2 74.7 81.6	82.5 89.1 86.9 76.2 87.8 91.6	85.9 93.1 92.2 91.6 95.9 96.6	79.7 86.9 94.4 91.6 95.0	85.9 91.9 91.9 91.2 94.1	87.2 92.5 84.4 95.0 95.0	59.9 73.1 85.2 79.1 90.6 75.8	74.7 76.8 60.5 78.1 81.1 80.5	71.0 71.0 75.1 64.6 78.1 79.5	65.3 56.9 49.5 24.6 62.3 69.4	74.1 71.7 75.1 64.0 79.1 82.2	66.7 73.4 83.2 78.1 83.5 80.1	53.9 59.3 80.8 80.8 83.5 76.8	74.1 70.4 81.8 80.5 86.5 81.1	66.7 69.7 79.5 66.0 81.8 75.8	67.7 63.0 57.9 32.0 65.0 70.0	72.1 7 74.4 7 79.8 8 73.4 7 84.2 8 80.5 8	1.7 4 5.8 6 5.9 7 5.9 7 5.9 7 5.9 7 5.2 7	52.7 63.3 70.2 76.6 73.4 75.0	61.7 67.2 69.4 65.1 92.6 68.3	50.6 5 55.1 6 59.4 5 55.1 4 58.3 5	50.0 (51.2 (54.8) 46.3 (58.0) 60.1 (67.6 84.0 92.6 84.0 87.2 86.7	62.2 4 89.4 7 88.8 7 85.1 7 86.7 7 87.6 7	8.9 60 1.8 88 6.6 92 7.1 91 5.5 91 7.7 91	1 53. 53 84. 16 92. 15 87. 10 88. 10 89.	7 47.9 0 59.6 6 72.9 2 65.4 3 68.1 4 64.4	64.9 81.9 94.7 88.3 95.3 89.4	64.9 85.1 89.9 91.0 96.3 89.4	59.6 74.9 78.4 59.1 86.5 94.2	69.6 (85.4) 77.8 (69.0 (91.8) 95.3 (55.5 93.6 94.7	52.5 59.6 60.8 38.0 77.2 81.3	70.2 73.7 64.3 65.5 93.6 90.6	67.8 76.0 79.5 71.9 91.8 97.7	66.7 70.8 76.6 72.5 90.6 92.4	66.7 78.4 88.9 75.4 93.6 95.3	65.5 80.7 78.4 71.9 93.6 95.3	43.3 1 71.9 8 62.6 8 58.5 7 78.9 8 91.2 8	73.7 67 83.6 85 88.9 85 74.9 82 88.9 93 85.4 91	7.3 5.4 1.5 1.6 .8
72.2 73.1 76.9 46.2 73.8 82.8 80.0	81.6 84.4 81.6 51.2 88.1 92.5 91.4	85.0 83.1 84.4 52.8 84.4 92.2 90.6	74.4 79.7 76.2 44.4 75.9 79.4 82.2	85.3 83.1 75.9 58.4 82.8 88.8 93.1	83.1 81.6 77.2 57.2 83.1 88.8 91.6	68.8 74.1 62.5 36.2 74.7 81.6 74.4	82.5 89.1 86.9 76.2 87.8 91.6 •2.2	85.9 3 93.1 0 92.2 9 91.6 9 95.9 9 96.6 9	79.7 86.9 94.4 91.6 95.0 90.6	85.9 91.9 91.2 94.1 94.1 69.7	87.2 92.5 84.4 95.0 95.0	59.9 73.1 85.2 79.1 90.6 75.8 59.9	74.7 76.8 80.5 78.1 81.1 80.5 75.1	71.0 71.0 75.1 64.6 78.1 79.5 71.7	65.3 56.9 49.5 24.6 62.3 69.4 65.3	74.1 71.7 75.1 64.0 79.1 82.2 68.0	66.7 73.4 83.2 78.1 83.5 80.1 71.7	53.9 59.3 80.8 80.8 83.5 76.8 66.3	74.1 3 70.4 3 81.8 3 80.5 3 86.5 3 81.1 3 71.4 3	66.7 69.7 79.5 66.0 81.8 75.8 72.1	67.7 63.0 57.9 32.0 65.0 70.0 69.7	72.1 7 74.4 7 79.8 8 73.4 7 84.2 8 80.5 8 73.4 7	1.7 4 5.8 6 5.9 1 5.9 1 6.1 1 5.2 1 5.1 5	52.7 63.3 70.2 76.6 73.4 75.0 56.4	61.7 67.2 89.4 85.1 92.6 88.3 70.7	50.6 3 55.1 6 55.1 4 55.1 4 55.1 4 56.3 5 55.1 6 72.3 5	50.0 6 51.2 8 54.8 9 46.3 8 55.0 8 55.0 8 55.0 8	67.6 84.0 92.6 84.0 87.2 86.7 86.7	62.2 4 89.4 7 88.8 7 85.1 7 86.7 7 87.6 7 68.6 5	8.9 60 1.8 68 6.6 92 7.1 91 5.5 91 7.7 91 5.9 65	 53. 84. 84. 92. 87. 87. 88. 88. 89. 89. 73. 	 47.9 59.6 59.6 72.9 65.4 66.1 64.4 53.7 	64.9 81.9 94.7 88.3 96.3 89.4 70.7	64.9 85.1 89.9 91.0 96.3 89.4 69.1	59.6 74.9 78.4 59.1 86.5 94.2 83.6	69.6 (85.4 (77.8 (69.0 (91.8 (95.3 (91.2 (56.7 78.9 75.4 55.5 93.6 94.7	52.5 59.6 60.8 38.0 77.2 81.3 76.0	70.2 73.7 64.3 65.5 93.6 90.6 87.7	67.8 76.0 79.5 71.9 91.8 97.7 87.7	66.7 70.8 76.6 72.5 90.6 92.4 84.8	66.7 78.4 88.9 75.4 93.6 95.3 93.0	65.5 80.7 78.4 71.9 93.6 95.3 92.4	43.3 1 71.9 8 62.6 2 58.5 7 78.9 8 91.2 8 82.5 9	73.7 67 83.6 85 68.9 86 74.9 82 88.9 93 85.4 91 91.8 93	7.3 5.4 1.3 1.5 .8 .0
72.2 73.1 76.9 46.2 73.8 82.8 80.0 81.2	81.6 84.4 81.6 51.2 88.1 92.5 91.6 91.6	85.0 83.1 84.4 52.8 84.4 92.2 90.6 95.3	74.4 79.7 76.2 44.4 75.9 79.4 82.2 89.1	85.3 83.1 75.9 58.4 82.8 88.8 93.1 93.4	83.1 81.6 77.2 57.2 83.1 88.8 91.6 93.4	68.8 74.1 62.5 36.2 74.7 81.6 74.4 78.8	82.5 89.1 86.9 76.2 87.8 91.6 91.6 92.2	85.9 1 93.1 8 92.2 9 91.6 9 95.9 9 96.6 1 90.3 1 92.2 1	79.7 86.9 94.4 91.6 95.0 90.6 83.8 80.0	85.9 91.9 91.2 94.1 94.1 89.7 90.6	87.2 87.2 92.5 84.4 95.0 95.0 92.8 90.9	59.9 73.1 85.2 79.1 90.6 75.8 59.9 75.8	74.7 76.8 80.5 78.1 81.1 80.5 75.1 82.8	71.0 71.0 75.1 64.6 78.1 79.5 71.7 77.8	65.3 56.9 49.5 24.6 62.3 69.4 65.3 72.4	74.1 75.1 64.0 79.1 82.2 68.0 81.1	66.7 73.4 83.2 78.1 83.5 80.1 71.7 84.8	53.9 59.3 80.8 80.8 83.5 76.8 66.3 73.7	74.1 70.4 81.8 80.5 86.5 81.1 71.4 84.2	66.7 69.7 79.5 66.0 81.8 75.8 72.1 81.8	67.7 63.0 57.9 32.0 65.0 70.0 69.7 71.7	72.1 7 74.4 7 79.8 8 73.4 7 84.2 8 80.5 8 73.4 7 80.8 7	1.7 4 5.8 6 5.9 1 5.1 1 5.2 1 5.1 5 5.1 5 5.1 5 5.1 5	52.7 63.3 70.2 76.6 73.4 75.0 56.4 73.4	61.7 67.2 69.4 65.1 92.6 88.3 70.7 86.7	50.6 3 55.1 6 55.1 6 55.1 6 55.1 6 55.1 6 72.3 5 57.2 5	50.0 6 51.2 8 54.8 1 46.3 1 58.0 8 50.1 8 53.2 1 59.0 1	67.6 84.0 92.6 84.0 87.2 86.7 86.7 89.4	62.2 4 89.4 7 88.8 7 85.1 7 86.7 7 87.8 7 68.6 5 88.3 7	8.9 60 1.8 68 6.6 92 7.1 91 5.5 91 7.7 91 5.9 65 3.9 67	1 53. 13 84. 16 92. 1.5 87. 1.0 88. 1.0 89. 1.4 73. 1.2 83.	 47.9 59.6 59.6 72.9 65.4 68.1 64.4 53.7 60.6 	64.9 81.9 94.7 55.3 96.3 89.4 70.7 87.8	64.9 85.1 89.9 91.0 96.3 89.4 69.1 85.1	59.6 74.9 78.4 59.1 86.5 94.2 83.6 89.5	69.6 6 85.4 1 77.8 1 69.0 1 91.8 1 95.3 1 91.2 1 96.5 1	55.5 53.6 94.7 94.2	52.6 59.6 60.8 38.0 77.2 81.3 76.0 80.1	70.2 73.7 64.3 93.6 90.6 87.7 87.7	67.8 79.5 71.9 91.8 97.7 87.7 88.9	66.7 70.8 76.6 90.6 92.4 84.8 93.0	66.7 78.4 88.9 75.4 93.6 95.3 93.0 97.7	65.5 80.7 78.4 71.9 93.6 95.3 92.4 94.2	 43.3 71.9 82.6 78.9 91.2 82.5 87.7 	73.7 67 83.6 85 88.9 85 88.9 93 85.4 91 91.8 93 95.3 94	7.3 1.4 1.3 1.6 1.6 1.0
72.2 73.1 76.9 46.2 73.6 82.6 80.0 81.2 68.6	81.6 84.4 81.6 81.6 81.6 88.1 92.5 91.6 93.4 89.7	 85.0 83.1 84.4 52.8 84.4 92.2 90.6 95.3 95.0 	74.4 79.7 76.2 44.4 75.9 79.4 82.2 89.1 96.6	85.3 83.1 75.9 58.4 82.8 88.8 93.1 93.4 90.9	83.1 81.6 77.2 57.2 83.1 88.8 91.6 93.4 95.3	68.8 74.1 62.5 36.2 74.7 81.6 74.4 75.8 76.6	82.5 89.1 86.9 76.2 87.8 91.6 92.2 92.2 92.2	85.9 1 93.1 6 92.2 9 91.6 9 95.9 9 96.6 1 90.3 6 92.2 1 92.3 1 94.1 1	79.7 2 86.9 2 94.4 2 91.6 2 95.0 2 90.6 2 83.8 2 80.0 2 73.8 2	85.9 91.9 91.9 91.2 94.1 94.1 99.7 90.6	87.2 92.5 84.4 95.0 95.0 92.8 90.9 85.8	59.9 73.1 85.2 79.1 90.6 75.8 59.9 75.8 83.5	74.7 76.8 80.5 78.1 81.1 80.5 75.1 82.8 89.2	71.0 71.0 75.1 64.6 78.1 79.5 71.7 77.8 80.5	65.3 56.9 49.5 24.6 62.3 69.4 65.3 72.4 67.3	74.1 71.7 75.1 64.0 79.1 82.2 68.0 81.1 84.8	66.7 73.4 83.2 83.5 80.1 71.7 84.8 83.2	53.9 59.3 80.8 80.8 83.5 76.8 66.3 73.7 88.2	74.1 70.4 81.8 80.5 86.5 81.1 71.4 84.2 84.2	66.7 69.7 79.5 66.0 81.8 75.8 72.1 81.8 80.8	67.7 63.0 57.9 32.0 65.0 70.0 69.7 71.7 71.4	72.1 7 74.4 7 79.8 8 73.4 7 84.2 8 80.5 8 73.4 7 80.8 7 80.8 7	1.7 1.7 5.6 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.7 1 5.8 1	52.7 63.3 70.2 76.6 73.4 75.0 56.4 73.4 73.4	61.7 67.2 69.4 85.1 92.6 88.3 70.7 86.7 90.4	50.6 3 55.1 6 55.1 6 55.1 6 55.1 6 55.1 6 72.3 3 57.2 3 57.2 3	50.0 6 51.2 8 54.8 1 46.3 1 58.0 4 50.1 4 50.2 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1 50.0 1	67.6 84.0 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6 92.6	62.2 4 89.4 7 88.8 7 85.1 7 86.7 7 86.7 7 68.6 5 88.3 7 94.7 7	8.9 60 1.8 88 6.6 92 7.1 91 5.5 91 7.7 91 5.9 65 3.9 67 1.3 91	 1 53. 84. 92. 87. 88. 89. 89. 89. 89. 89. 89. 89. 80. 80. 80. 80. 80. 80. 80. 	 47.9 59.6 59.6 72.9 65.4 68.1 68.1 68.1 64.4 53.7 60.6 54.8 	64.9 94.7 88.3 96.3 89.4 70.7 87.8 87.8	64.9 85.1 89.9 91.0 96.3 89.4 69.1 85.1 92.0	59.6 74.9 78.4 59.1 86.5 94.2 83.6 89.5 90.6	69.6 (85.4 (77.8 (91.8 (91.8 (91.2 (91.2 (95.3 (95.3 (95.3 (55.5 33.6 94.7 94.2	52.6 59.6 60.8 38.0 77.2 81.3 76.0 80.1 76.6	70.2 73.7 64.3 93.6 90.6 87.7 87.7 92.4	67.8 76.0 79.5 91.8 97.7 87.7 88.9 89.5	66.7 70.8 76.6 90.6 92.4 84.8 93.0 87.1	66.7 78.4 88.9 75.4 93.6 95.3 93.0 97.7 94.7	65.5 80.7 78.4 93.6 95.3 92.4 94.2 90.6	43.3 71.9 62.6 58.5 78.9 81.2 82.5 87.7 5 87.7 5	73.7 67 83.6 85 88.9 82 74.9 82 88.9 93 85.4 91 91.8 92 91.8 92	7.3 5.4 1.3 1.5 1.6 1.0 1.2 .4
72.22 73.1 76.9 46.2 73.6 82.6 80.0 81.2 68.8 39.7	81.6 84.4 81.6 81.1 92.5 91.0 93.4 89.3 93.4 89.3	 85.0 83.1 84.4 52.8 84.4 92.2 90.6 95.3 95.0 88.1 	74.4 79.7 76.2 44.4 75.9 79.4 82.2 89.1 95.6 89.4	 85.3 83.1 75.9 58.4 88.8 93.1 93.4 90.9 90.6 	83.1 81.6 77.2 57.2 83.1 88.8 91.6 93.4 95.3 81.6	68.8 74.1 62.5 36.2 74.7 81.6 74.4 76.6 76.6	82.5 89.1 86.9 76.2 87.8 91.6 91.6 92.2 92.2 89.4 55.6	85.9 1 93.1 0 92.2 2 91.6 2 95.9 2 96.6 2 90.3 2 92.2 1 84.1 2 57.8 3	79.7 3 86.9 3 94.4 3 91.6 4 95.0 3 90.6 3 83.8 3 80.0 3 73.8 3 55.0 4	85.9 91.9 91.2 91.2 94.1 94.1 90.6 82.8 57.8	87.2 87.2 92.5 84.4 95.0 95.0 95.0 95.0 95.5 59.7	59.9 73.1 85.2 79.1 90.6 75.8 59.9 75.8 83.5 83.5	74.7 76.8 80.5 78.1 81.1 80.5 75.1 82.8 89.2 81.1	71.0 71.0 75.1 64.6 78.1 79.5 71.7 77.8 80.5 70.0	65.3 56.9 49.5 24.6 62.3 69.4 65.3 72.4 67.3 38.4	74.1 71.7 75.1 64.0 79.1 82.2 68.0 81.1 84.8 71.7	66.7 73.4 83.2 78.1 83.5 80.1 71.7 84.8 83.2 83.2	53.9 59.3 80.8 80.8 83.5 76.8 66.3 73.7 88.2 85.5	74.1 70.4 81.8 80.5 86.5 81.1 71.4 84.2 84.2 84.2 80.1	66.7 69.7 79.5 66.0 81.8 75.8 72.1 81.8 80.8 65.0	67.7	72.1 7 74.4 7 79.8 8 73.4 7 84.2 8 80.5 8 73.4 7 80.8 7 80.8 7 80.8 7 82.5 8 80.9 8	1.7 1.7 5.0 1 5.1 1 3.1 1 3.1 1 3.1 1 3.1 1 3.1 1 3.1 1 3.1 1 3.1 1 3.1 1 3.1 1 3.1 1	52.7 63.3 70.2 76.6 73.4 75.0 56.4 73.4 73.2 75.5	61.7 67.2 89.4 85.1 92.6 88.3 70.7 86.7 90.4 88.3	50.6 : 55.1 (55.1 (55.1) 55.1) 55.1) 55.1 (55.1) 55.1) 55.1) 55.1 (55.1) 55.1) 55	50.0 1 61.2 1 46.3 1 46.3 1 58.0 1 60.1 4 53.2 1 59.0 1 69.7 1 69.7 1 71.3 1	67.6 6 64.0 6 92.6 9 84.0 1 84.0 1 84.0 1 85.7 1 10 10 10 10 10 10 10 10 10 1	62.2 4 89.4 7 88.8 7 85.1 7 86.7 7 86.8 7 86.8 7 88.3 7 94.7 7 91.5 7	8.9 60 1.8 68 6.6 92 7.1 91 5.5 91 7.7 91 5.9 65 3.9 67 1.3 91 8.2 81	1 53. 13 84. 16 92. 1.5 87. 1.0 88. 1.0 89. 1.4 73. 1.2 83. 1.0 88. 1.0 88. 1.0 88.	 47.9 59.6 59.6 72.9 65.4 68.1 64.4 53.7 60.6 54.8 50.0 	64.9 94.7 88.3 96.3 89.4 70.7 87.8 87.2 87.8	64.9 85.1 91.0 96.3 89.4 69.1 85.1 92.0 83.0	59.6 74.9 78.4 59.1 86.5 94.2 83.6 89.5 90.6 64.9	69.6 (85.4 (77.8 (69.0 (91.8 (95.3 (56.7 78.9 75.4 55.5 93.6 94.7 94.7 94.2 91.2	52.6 59.6 60.8 38.0 77.2 81.3 76.0 80.1 76.6 49.1	70.2 73.7 64.3 65.5 93.6 90.6 87.7 87.7 92.4 85.4	67.8 79.5 71.9 91.8 97.7 87.7 88.9 89.5 89.5	66.7 70.8 76.6 72.5 90.6 92.4 84.8 93.0 87.1 64.9	66.7 78.4 88.9 75.4 93.6 95.3 93.0 97.7 94.7 67.3	65.5 80.7 78.4 93.6 95.3 92.4 92.4 92.4 92.4 92.5	43.3 71.9 62.6 58.5 78.9 91.2 82.5 87.7 58.7.7 31.6	73.7 67 83.6 82 88.9 82 74.9 82 88.9 93 85.4 91 91.8 93 95.3 94 91.8 92 85.3 94 91.8 92 85.3 94	7.3 5.4 1.3 1.5 1.6 1.0 1.2 1.4 1.4
72.2 73.1 76.9 46.2 73.6 80.0 81.2 68.8 39.7 64.4	81.6 84.4 81.6 51.2 92.5 91.4 93.4 89.3 76.5 76.5	85.0 83.1 84.4 52.6 84.4 92.2 90.6 95.3 95.0 88.1	74.4 79.7 76.2 44.4 75.9 79.4 82.2 89.1 96.6 89.4 94.7	 85.3 83.1 75.9 58.4 82.8 83.8 93.1 93.4 90.9 90.6 	83.1 81.6 77.2 57.2 83.1 88.8 91.6 93.4 95.3 81.6 89.7	68.8 74.1 62.5 36.2 74.7 81.6 76.6 76.6 48.1	82.5 89.1 86.9 76.2 87.8 91.6 92.2 89.4 55.6 84.1	85.9 1 93.1 1 92.2 2 91.6 2 95.9 2 96.6 1 90.3 1 92.2 1 84.1 1 57.8 1 83.4 1	79.7 86.9 94.4 91.6 91.6 90.6 83.8 80.0 73.8 55.0 76.9	85.9 91.9 91.9 91.2 94.1 94.1 90.6 82.8 57.8	87.2 87.2 92.5 84.4 95.0 95.0 92.8 90.9 85.6 59.7 78.4	59.9 73.1 85.2 79.1 90.6 59.9 75.8 83.5 83.5 85.5	74.7 76.8 80.5 78.1 81.1 80.5 75.1 82.8 69.2 81.1 83.2	71.0 75.1 64.6 78.1 79.5 71.7 77.8 80.5 70.0 80.1	65.3 56.9 49.5 24.6 62.3 69.4 65.3 72.4 67.3 38.4 53.9	74.1 71.7 75.1 64.0 79.1 82.2 68.0 81.1 84.8 71.7 83.5	66.7 73.4 83.2 78.1 83.5 80.1 71.7 84.6 83.2 83.5 85.2	53.9 59.3 80.8 80.8 83.5 76.8 66.3 73.7 88.2 85.2 85.2	74.1 70.4 81.8 80.5 86.5 81.1 71.4 84.2 84.2 84.2 84.2 84.2 84.2	66.7 69.7 79.5 66.0 81.8 75.8 81.8 81.8 80.8 65.0	67.7 6 63.0 1 57.9 1 32.0 1 65.0 1 67.7 1 70.0 1 71.7 1 71.4 1 27.6 1 52.5 1	72.1 7 74.4 7 79.8 8 773.4 7 84.2 8 84.2 84.2 8 84.2 8 84.	1.7 2 5.6 0 5.9 1 3.1 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.5 1 5.1 5 5.1 5 5.1 5 5.1 5 5.3 5 5.4 5 5.5 5 5.1 5 5 5 5 5 5 5 5 5 5 5 6 5 7 5 7 5 7 5 7 5 7 5 <	52.7 63.3 70.2 76.6 73.4 75.0 56.4 73.4 75.5 75.5 75.5	61.7 67.2 69.4 65.1 92.6 86.3 70.7 86.7 90.4 68.3 94.1	550.6 1 553.1 6 553.1 6 553.1 6 553.1 6 553.1 6 553.1 6 553.1 6 553.1 6 553.1 6 553.1 6 72.3 1 553.7 1 6 6 6 6 72.3 1 6 6 72.3 1 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	50.0 1 51.2 1 54.8 1 558.0 1 558.0 1 558.0 1 559.0 1 559.0 1 559.0 1 559.0 1 69.7 1 69.7 1 559.0 1	67.6 6 64.0 1 92.6 5 84.0 5 87.2 5 88.7 5 88.7 5 93.4 5 95.7 5 95.7 5 95.8 5 91.5 5	62.2 4 89.4 7 88.8 7 85.1 7 85.7 7 86.8 5 68.6 5 94.7 7 91.5 7 89.4 7	8.9 60 1.8 88 6.6 92 7.1 91 5.5 91 5.7 91 5.8 65 3.9 87 1.3 91 8.2 81	1 53. 13 84. 16 92. .5 87. .6 88. .6 88. .6 88. .6 88.	 47.9 59.6 72.9 65.4 68.1 64.4 53.7 60.6 54.8 54.8 50.0 49.5 	64.9 81.9 94.7 88.3 96.3 89.4 70.7 87.8 87.2 87.8 92.6	64.9 65.1 89.9 91.0 96.3 89.4 69.1 85.1 92.0 83.0 83.8	59.6 78.4 59.1 86.5 94.2 83.6 89.5 90.6 64.9 71.9	69.6 1 85.4 1 77.8 1 69.0 1 91.8 1 95.3 1 96.5 1 95.3 1 95.3 1 79.5 1 84.2 1	56.7 78.9 75.4 55.5 93.6 94.7 94.7 94.2 91.2 74.3 84.8	52.6 59.6 60.8 38.0 77.2 81.3 76.0 80.1 76.6 49.1 61.4	70.2 73.7 64.3 65.5 93.6 90.6 87.7 87.7 92.4 85.4 80.1	67.8 79.5 71.9 91.8 97.7 88.9 88.9 80.1 80.1	66.7 70.8 76.6 72.5 90.6 92.4 84.8 93.0 87.1 64.9 74.3	66.7 78.4 88.9 75.4 93.6 95.3 93.0 97.7 94.7 67.3 80.1	65.5 80.7 78.4 71.9 93.6 95.3 94.2 90.6 65.5 79.5	43.3 62.6 58.5 78.9 91.2 82.5 82.7 837.7 51.6 62.6	73.7 67 83.6 85 88.9 85 74.9 82 85.4 91 91.8 92 95.3 94 91.8 65 91.8 92 67.8 65 71.3 7	7.3 5.4 1.3 1.5 1.6 1.8 1.0 1.2 1.4 1.4
72.2 73.1 76.9 46.2 73.8 82.6 80.0 81.2 66.8 39.7 64.4 75.3	 81.6 84.4 <li< th=""><th> 85.0 83.1 84.4 52.6 84.4 92.2 90.6 95.0 86.1 90.0 95.0 </th><th>74.4 79.7 76.2 44.4 75.9 79.4 82.2 89.1 96.6 89.4 94.7 87.2</th><th> 85.3 85.4 82.8 83.1 93.1 93.4 93.4 </th><th>83.1 81.6 77.2 57.2 83.1 88.8 91.6 93.4 95.3 81.6 89.7 88.4</th><th>68.8 74.1 62.5 36.2 74.7 81.6 76.8 76.8 48.1 74.1 75.3</th><th>82.5 89.1 86.9 76.2 87.8 91.6 92.2 89.4 89.4 55.6 84.1 91.8</th><th>85.9 1 93.1 8 92.2 1 91.6 1 95.9 1 96.6 1 90.3 6 90.3 6 92.2 1 93.3 1 94.1 1 57.6 2 83.4 1 90.6 4</th><th>79.7 · · · · · · · · · · · · · · · · · · ·</th><th>85.9 91.9 91.2 91.2 94.1 94.1 94.1 90.6 82.8 57.8 79.4</th><th>87.2 87.2 92.5 84.4 95.0 95.0 95.0 92.8 90.9 85.6 59.7 78.4 88.8</th><th>59.9 73.1 85.2 79.1 90.6 59.9 75.8 83.5 85.5 85.5 85.5</th><th>74.7 76.8 80.5 78.1 81.1 80.5 75.1 82.8 89.2 81.1 83.2 79.5</th><th>71.0 75.1 64.6 78.1 79.5 71.7 77.8 80.5 70.0 80.1 74.4</th><th>65.3 56.9 49.5 24.6 62.3 69.4 65.3 72.4 67.3 38.4 53.9 71.7</th><th>74.1 71.7 75.1 64.0 79.1 62.2 68.0 61.1 84.8 71.7 83.5 81.1</th><th>66.7 73.4 83.2 78.1 83.5 80.1 71.7 84.8 83.2 83.5 85.2 83.5</th><th> 53.9 59.3 80.8 80.8 83.5 76.8 76.8 85.2 85.5 83.2 76.4 </th><th>74.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</th><th>66.7 69.7 79.5 66.0 81.8 75.8 81.8 80.8 66.0 72.1 75.1</th><th>67.7 [63.0] 57.9 [57.9] 65.0 [65.0] 69.7] 71.4] 27.6] 52.5] 69.0]</th><th>72.1 7 72.4 7 74.4 7 79.8 8 73.4 7 73.4 7 880.5 8 80.6 7 80.8 7 80.8 7 80.5 8 80.5 8 80.6 7 80.8 7 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8</th><th>1.7 1.7 5.8 6 5.9 1 5.9 1 3.1 1 5.2 1 5.1 5 5.1 5 9.1 1 3.8 1 1.1 7 1.4.8 1</th><th>52.7 63.3 70.2 76.6 73.4 75.0 56.4 73.4 75.2 75.5 77.1</th><th>61.7 67.2 69.4 85.1 92.6 88.3 70.7 86.7 90.4 88.3 94.1 90.4</th><th>50.6 : 55.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 :</th><th>550.0 1 551.2 1 554.8 1 46.3 1 558.0 1 558.0 1 60.1 1 559.0 1 559.0 1 559.0 1 60.7 1 659.7 1 660.7 1 660.0 1 660.0 1 663.3 1</th><th>67.6 (84.0 (92.6 (84.0 (84.0 (87.2 (86.7 (86.7 (86.7 (86.7 (86.8 (95.7 (88.8 (91.5 (</th><th>62.2 4 89.4 7 83.8 7 85.1 7 86.7 7 86.8 5 86.8 5 94.7 7 91.5 7 89.4 7</th><th>8.9 60 1.8 88 6.6 92 7.1 91 5.5 91 7.7 91 5.9 65 3.9 87 1.3 91 8.2 81 3.9 85 3.9 90</th><th>1 53. 13 84. 14 92. 15 87. 10 88. 11 73. 12 83. 13 84. 14 73. 15 87. 16 83. 17 83. 18 81. 19 81. 10 83. 11 84. 12 83.</th><th>7 47.9 0 59.6 1 72.9 2 85.4 3 68.1 4 63.7 0 80.6 3 54.8 9 50.0 5 49.5 6 62.2</th><th> 64.9 61.9 94.7 88.3 96.3 69.4 70.7 87.8 87.8 87.8 87.8 87.8 82.6 89.9 </th><th>64.9 65.1 89.9 91.0 96.3 89.4 69.1 85.1 92.0 83.0 83.0 88.8 91.5</th><th>59.6 74.9 78.4 59.1 85.5 94.2 83.6 89.5 90.8 64.9 71.9 76.6</th><th>69.6 6 85.4 1 77.8 1 69.0 1 91.8 1 95.3 1 96.5 1 95.3 1 95.3 1 95.3 1 95.3 1 95.3 1 95.4 1 86.0 2</th><th>56.7 75.4 55.5 93.6 94.7 94.2 91.2 74.3 94.8 94.9</th><th>52.6 59.6 60.8 38.0 77.2 81.3 76.0 80.1 76.6 49.1 61.4</th><th>70.2 73.7 64.3 65.5 93.6 90.6 87.7 87.7 92.4 85.4 80.1</th><th>67.8 79.5 71.9 91.8 97.7 88.9 88.9 80.1 80.1 84.2 87.1</th><th>66.7 70.8 76.6 72.5 90.6 92.4 84.8 93.0 87.1 64.9 74.3 81.3</th><th>66.7 78.4 88.9 75.4 93.6 93.0 93.0 97.7 94.7 67.3 60.1 91.8</th><th>65.5 80.7 78.4 93.6 95.3 92.4 94.2 90.6 65.5 79.5</th><th>43.3 1 62.6 1 58.5 1 78.9 6 91.2 6 87.7 5 74.8 6 31.6 6</th><th>73.7 67 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 94 93.6 94 94.7 92 95.3 94 95.3 94 95.4 92 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.6 95 95.7 95 95.7 95 95.7</th><th>7.3 5.4 1.3 1.5 1.8 1.8 1.8 1.8 1.8 1.8 1.4 1.4 1.4 1.4 1.4</th></li<>	 85.0 83.1 84.4 52.6 84.4 92.2 90.6 95.0 86.1 90.0 95.0 	74.4 79.7 76.2 44.4 75.9 79.4 82.2 89.1 96.6 89.4 94.7 87.2	 85.3 85.4 82.8 83.1 93.1 93.4 93.4 	83.1 81.6 77.2 57.2 83.1 88.8 91.6 93.4 95.3 81.6 89.7 88.4	68.8 74.1 62.5 36.2 74.7 81.6 76.8 76.8 48.1 74.1 75.3	82.5 89.1 86.9 76.2 87.8 91.6 92.2 89.4 89.4 55.6 84.1 91.8	85.9 1 93.1 8 92.2 1 91.6 1 95.9 1 96.6 1 90.3 6 90.3 6 92.2 1 93.3 1 94.1 1 57.6 2 83.4 1 90.6 4	79.7 · · · · · · · · · · · · · · · · · · ·	85.9 91.9 91.2 91.2 94.1 94.1 94.1 90.6 82.8 57.8 79.4	87.2 87.2 92.5 84.4 95.0 95.0 95.0 92.8 90.9 85.6 59.7 78.4 88.8	59.9 73.1 85.2 79.1 90.6 59.9 75.8 83.5 85.5 85.5 85.5	74.7 76.8 80.5 78.1 81.1 80.5 75.1 82.8 89.2 81.1 83.2 79.5	71.0 75.1 64.6 78.1 79.5 71.7 77.8 80.5 70.0 80.1 74.4	65.3 56.9 49.5 24.6 62.3 69.4 65.3 72.4 67.3 38.4 53.9 71.7	74.1 71.7 75.1 64.0 79.1 62.2 68.0 61.1 84.8 71.7 83.5 81.1	66.7 73.4 83.2 78.1 83.5 80.1 71.7 84.8 83.2 83.5 85.2 83.5	 53.9 59.3 80.8 80.8 83.5 76.8 76.8 85.2 85.5 83.2 76.4 	74.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	66.7 69.7 79.5 66.0 81.8 75.8 81.8 80.8 66.0 72.1 75.1	67.7 [63.0] 57.9 [57.9] 65.0 [65.0] 69.7] 71.4] 27.6] 52.5] 69.0]	72.1 7 72.4 7 74.4 7 79.8 8 73.4 7 73.4 7 880.5 8 80.6 7 80.8 7 80.8 7 80.5 8 80.5 8 80.6 7 80.8 7 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8 80.9 8	1.7 1.7 5.8 6 5.9 1 5.9 1 3.1 1 5.2 1 5.1 5 5.1 5 9.1 1 3.8 1 1.1 7 1.4.8 1	52.7 63.3 70.2 76.6 73.4 75.0 56.4 73.4 75.2 75.5 77.1	61.7 67.2 69.4 85.1 92.6 88.3 70.7 86.7 90.4 88.3 94.1 90.4	50.6 : 55.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 : 35.1 :	550.0 1 551.2 1 554.8 1 46.3 1 558.0 1 558.0 1 60.1 1 559.0 1 559.0 1 559.0 1 60.7 1 659.7 1 660.7 1 660.0 1 660.0 1 663.3 1	67.6 (84.0 (92.6 (84.0 (84.0 (87.2 (86.7 (86.7 (86.7 (86.7 (86.8 (95.7 (88.8 (91.5 (62.2 4 89.4 7 83.8 7 85.1 7 86.7 7 86.8 5 86.8 5 94.7 7 91.5 7 89.4 7	8.9 60 1.8 88 6.6 92 7.1 91 5.5 91 7.7 91 5.9 65 3.9 87 1.3 91 8.2 81 3.9 85 3.9 90	1 53. 13 84. 14 92. 15 87. 10 88. 11 73. 12 83. 13 84. 14 73. 15 87. 16 83. 17 83. 18 81. 19 81. 10 83. 11 84. 12 83.	7 47.9 0 59.6 1 72.9 2 85.4 3 68.1 4 63.7 0 80.6 3 54.8 9 50.0 5 49.5 6 62.2	 64.9 61.9 94.7 88.3 96.3 69.4 70.7 87.8 87.8 87.8 87.8 87.8 82.6 89.9 	64.9 65.1 89.9 91.0 96.3 89.4 69.1 85.1 92.0 83.0 83.0 88.8 91.5	59.6 74.9 78.4 59.1 85.5 94.2 83.6 89.5 90.8 64.9 71.9 76.6	69.6 6 85.4 1 77.8 1 69.0 1 91.8 1 95.3 1 96.5 1 95.3 1 95.3 1 95.3 1 95.3 1 95.3 1 95.4 1 86.0 2	56.7 75.4 55.5 93.6 94.7 94.2 91.2 74.3 94.8 94.9	52.6 59.6 60.8 38.0 77.2 81.3 76.0 80.1 76.6 49.1 61.4	70.2 73.7 64.3 65.5 93.6 90.6 87.7 87.7 92.4 85.4 80.1	67.8 79.5 71.9 91.8 97.7 88.9 88.9 80.1 80.1 84.2 87.1	66.7 70.8 76.6 72.5 90.6 92.4 84.8 93.0 87.1 64.9 74.3 81.3	66.7 78.4 88.9 75.4 93.6 93.0 93.0 97.7 94.7 67.3 60.1 91.8	65.5 80.7 78.4 93.6 95.3 92.4 94.2 90.6 65.5 79.5	43.3 1 62.6 1 58.5 1 78.9 6 91.2 6 87.7 5 74.8 6 31.6 6	73.7 67 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 92 93.6 94 93.6 94 94.7 92 95.3 94 95.3 94 95.4 92 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.5 94 95.6 95 95.7 95 95.7 95 95.7	7.3 5.4 1.3 1.5 1.8 1.8 1.8 1.8 1.8 1.8 1.4 1.4 1.4 1.4 1.4

(a) Our view-visiting frequencies and their corresponding single view accuracy during training.

58.1	50.7	56.3	51.9	53.9	58.4	53.1	46.9	50.7	56.5	52.8	52.7	56.9	45.6	25.4	6.4	24.3	46.8	53.2 4	2.5	21.2 9	.7 2	9.3 51	1 71	5 93.6	97.9	93.9	97.1	94.9	59.5 93	98.1	94.1	97.3 94.9	20.0	13.9	18.3	23,5	24.3	20.9	18.3	17.4	17.4	20.9	21.7 20.
55.3	63.3	68.6	66.0	67.2	67.7	61.4	69.6	75.5	76.6	71.3	70.9	51.8	45.2		2.9	24.9	43.1	48.5 4	7.4	29.5 1	2.2 3	57.3 46	73	.6 94.7	96.5	93.9	94.1	94.9	68.8 88	5 88.0	78.7	89.3 92.8	12.2	4.3	0.9		9.6	14.8	16.5	19.1	25.2	31.3	26.1 15.
62.9	71.3	71.7	67.9	69.7	72.8	56.4	69.3	77.2	80.4	81.2	71.5	44.9		6.0	1.6	10.9	47.2	57.1 5	3.2	33.0 2	.5 3	56.3 44	1 78	93.3	93.6	88.5	87.7	86.1	79.2 60	0 51.5	62.7	68.0 86.4	4.3	0.9	0.9	0.9	0.9		13.0	22.6	22.6	20.9	20.0 14.1
67.7	62.5	62.6	53.7	64.1	61.3	49.8	57.6	71.5	67.0	65.6	66.2	48.2	32.4	0.6	4.3	3.7	46.2	54.2 5	5.7	35.3 4	3 3	51.1 45	4 85	.1 86.7	85.6	76.8	81.6	59.2	84.5 8.8	46.7	58.1	41.1 10.4	3.5	0.9	0.0	0.0	0.0	5.2	17.4	16.5	17.4	14.8	12.2 13.
73.7	73.6	69.1		66.6	72.8	64.1	75.2	79.5	83.9	79.0	76.2	66.0	40.0	4.7	0.4	6.0	42.9	49.5 5	3.8	32.4 7	.6 4	5.6 57	9 74	.7 92.8	84.5	85.3	85.3	91.7	69.9 76	3 64.0	63.5	41.1 70.1	9.6	5.2	1.7		0.0	4.3	13.0	16.5	14.8	12.2	9.6 12.
65.5	69.2	68.4	81.2	70.4	63.1	69.4	68.5	74.5	81.8	76.8	73.7	55.9	52.0	21.2	11.3	26.4	42.9	53.6 4	9.3	32.8 1	9.2 3	5.9 56	3 66	.1 94.7	94.1	84.3	91.2	92.8	58.1 90	88.0	72.5	81.3 86.7	12.2	9.6	7.8	5.2	6.1	7.8	10.4	14.8	10.4	11.3	15.7 15.7
57.5	59.0	57.6	70.8	63.8	53.8	53.5	52.6		69.0	65.2	65.2	42.5	38.6	24.7	18.1			48.5 4	2.9	37.1	1.0 2	6.0 42	9 64	.0 92.3	94.9	80.8	95.2	92.0	57.3 94	96.5	81.9	93.9 92.3	7.0	8.7	5.2	6.1	5.2	3.5	3.5	4.3	5.2	4.3	4.3 7.0
67.1	65.6	69.2	79.1	77.3	58.5	51.3	55.0	57.3	78.4	65.0	61.0	51.5	25.6	29.1	8.5		51.8	54.8 4	8.0	33.8 7	.6	2.4 37	9 70	.9 89.9	84.0		75.2	86.9	66.7 96	94.9	84.5	93.3 93.1	10.4	15.7	16.5	14.8	15.7	14.8	8.7	5.2	5.2	3.5	5.2 8.7
59.6	79.1	73.0	80.5	76.1	71.4	68.5	60.9	62.0	70.5	50.7	67.9	47.2	38.6	30.3	0.6	27.6	48.7	63.7 4	1.6	5.2 0	4	1.7 41	4 83	.2 71.5	56.3	47.7	23.5	58.1	78.7 95	2 86.7	86.7	81.3 86.4	6.1	16.5	14.8	11.3		14.8	9.6	4.3	1.7	0.0	0.0 1.7
50.9	67.1		62.3	65.2	63.5	68.1	54.3	46.1	36.5	44.6	51.7	54.6	50.1	22.9	3.7	27.8	44.5	41.4 2	7.6	1.0 4	.9 3	5.3 42	7 86	.9 2.7	18.7	41.9	23.5	7.7	83.7 82	1 89.6	81.9	83.2 60.8	9.6	17.4	16.5		15.7	9.6	6.1	1.7	0.0	0.0	0.0 2.6
57.1	75.9	78.0	75.0	79.8	65.2	60.2	67.4	64.9	58.3	57.2	58.3	55.3	55.1	47.2	4.7	30.3	41.9	47.8 4	0.0	3.7 2	.7 9	9.7 41	9 81	.1 62.4	21.6	46.9	56.0	80.0	72.3 93	3 94.9	89.3	84.0 86.7	13.0	11.3	9.6	13.0	13.0	11.3	2.6	0.0	0.0	0.0	0.0 4.3
62.6	68.3	73.7	75.0	71.5	66.2	57.7	62.2	59.3	65.6	62.4	58.8	53.6	49.3	33.8	6.0	29.9	52.4	55.9 4	7.8	20.4 5	.8 2	24.7 52	4 77	.3 86.1	72.0	58.7	87.5	92.8	58.4 94	4 98.1	91.5	94.4 93.6	16.5	18.3	18.3	18.3	14.8	19.1	10.4	2.6	0.9		6.1 10.
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0.0	44.1	43.8	42.2	40.9	22.2	0.6	40.9	43.8	44.7	40.0	22.8	10.8	40.4	37.7	10.4	38.4	39.4	11.4 3	8.7	34.7 7	4	1.1 40	4 0.	0.5	9.6	47.9	3.2	0.0	0.0 0.0	5.3	50.0	1.1 0.0	6.4	0.0	2.3	1.8	1.8	2.3	11.1	7.0	0.6	0.0	0.6 1.2
0.0 0.0	44.1 42.8	43.8 38.4	42.2 26.6	40.9 38.4	22.2 22.2	0.6 2.2	40.9 56.2	43.8 56.9	44.7 51.2	40.0 64.4	22.8 47.5	10.8 27.6	40.4 40.7	37.7 28.3	10.4 6.1	38.4 22.9	39.4 22.6	11.4 3 10.1 2	8.7 7.6	34.7 <mark>7</mark> 29.0 6	.1 4 .4 2	1.1 40 86.3 40	4 0.0 7 11	0.5	9.6 64.9	47.9 6.9	3.2 62.2	0.0 34.0	0.0 0.0	5.3 9 <mark>63.3</mark>	50.0 41.0	1.1 0.0 62.2 21.8	6.4 5.8	0.0 2.9	2.3 0.6	1.8 2.3	1.8 1.8	2.3 1.2	11.1 21.6	7.0 12.9	0.6 8.8	0.0 2.9	0.6 1.2 2.9 5.3
0.0 0.0 2.8	44.1 42.8 30.0	43.8 38.4 16.2	42.2 26.6 8.4	40.9 38.4 21.9	22.2 22.2 21.9	0.6 2.2 12.5	40.9 56.2 59.1	43.8 56.9 60.9	44.7 51.2 55.6	40.0 64.4 69.1	22.8 47.5 71.2	10.8 27.6 31.0	40.4 40.7 30.0	37.7 28.3 13.8	10.4 6.1 0.0	38.4 22.9 5.1	39.4 22.6 20.2	11.4 3 10.1 2 14.8 1	8.7 7.6 6.8	34.7 7 29.0 6 13.8 1	.1 4 .4 2 .0 1	H.1 40 6.3 40 15.5 37	4 0.0 7 11 0 33	0 0.5 .2 31.4 .0 51.1	9.6 64.9 76.6	47.9 6.9 1.1	3.2 62.2 80.3	0.0 34.0 49.5	0.0 0.0 11.7 30 30.9 41	5.3 9 63.3 5 76.6	50.0 41.0 43.6	1.1 0.0 62.2 21.8 72.9 44.1	6.4 5.8	0.0 2.9 0.6	2.3 0.6 0.0	1.8 2.3 0.6	1.8 1.8 0.0	2.3 1.2 2.9	11.1 21.6 20.5	7.0 12.9 19.3	0.6 8.8 26.9	0.0 2.9 14.0	0.6 1.2 2.9 5.3 7.6 7.6
0.0 0.0 2.8 2.8	44:1 42.8 30.0 2.8	43.8 38.4 16.2 0.3	42.2 26.6 8.4 0.3	40.9 38.4 21.9 0.0	22.2 22.2 21.9 1.6	0.6 2.2 12.5 5.3	40.9 56.2 59.1 23.1	43.8 56.9 60.9 50.3	44.7 5 51.2 5 55.6 5 50.0 5	40.0 3 64.4 5 69.1 3 49.7 3	22.8 47.5 71.2 23.8	10.8 27.6 31.0 17.8	40.4 40.7 30.0 14.8	37.7 28.3 13.8 0.3	10.4 6.1 0.0 0.0	38.4 22.9 5.1 0.3	39.4 22.6 20.2 13.5	11.4 3 10.1 2 14.8 1 16.5 1	8.7 7.6 6.8 1.4	34.7 <mark>7</mark> 29.0 6 13.8 1 0.3 0	.1 4 .4 2 .0 1 .3 0	H1.1 40 (6.3 40 (5.5 37 ().0 16	4 0.0 7 111 0 3.3 5 3.2	0.5 .2 .0 .4 .4 .5	9.6 64.9 76.6 76.6	47.9 6.9 1.1 0.0	3.2 62.2 80.3 79.3	0.0 34.0 49.5 45.2	0.0 0.0 11.7 30 30.9 41 27.7 30	5.3 9 63.3 5 76.6 9 69.1	50.0 41.0 43.6 39.9	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9	6.4 5.8 4.1 0.0	0.0 2.9 0.6 0.0	2.3 0.6 0.0	1.8 2.3 0.6 0.0	1.8 1.8 0.0 0.0	2.3 1.2 2.9 4.7	11.1 21.6 20.5 1.2	7.0 12.9 19.3 4.1	0.6 8.8 26.9 10.5	0.0 2.9 14.0	0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0
0.0 0.0 2.8 2.8 2.8	44.1 42.8 30.0 2.8 58.8	43.8 38.4 16.2 0.3 41.9	42.2 26.6 8.4 0.3 21.2	40.9 38.4 21.9 0.0 29.1	22.2 22.2 21.9 1.6 54.4	0.6 2.2 12.5 5.3	40.9 56.2 59.1 23.1 69.1	43.8 · 56.9 : 60.9 : 50.3 : 64.7 :	44.7 51.2 55.6 55.6	40.0 : 64.4 : 69.1 : 49.7 : 56.9 :	22.8 47.5 71.2 23.8 77.8	10.8 27.6 31.0 17.8 16.5	40.4 40.7 30.0 14.8 18.5	37.7 28.3 13.8 0.3 9.1	10.4 6.1 0.0 0.0	38.4 22.9 5.1 0.3 24.9	39.4 22.6 20.2 13.5 32.7	11.4 3 10.1 2 14.8 1 16.5 1 35.0 4	8.7 7.6 6.8 1.4 7.1	34.7 <mark>7</mark> 29.0 6 13.8 1 0.3 0 31.6 1	.1 4 .4 2 .0 1 .3 0 .0 1	H1.1 40 26.3 40 15.5 37 0.0 16 11.4 13	4 0.0 7 111 0 33 5 32 8 38	0.5 2 31.4 0 51.1 4 48.9 8 51.1	9.6 64.9 76.6 76.6 66.0	47.9 6.9 1.1 0.0 1.6	3.2 62.2 80.3 79.3 79.8	0.0 34.0 49.5 45.2 60.1	0.0 0.0 111.7 30 30.9 41. 27.7 30 40.4 30	5.3 9 63.3 5 76.6 9 69.1 9 66.0	50.0 41.0 43.6 39.9 39.4	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7	6.4 5.8 4.1 0.0 6.4	0.0 2.9 0.6 0.0 20.5	2.3 0.6 0.0 0.0 7.0	1.8 2.3 0.6 0.0	1.8 1.8 0.0 0.0 1.8	2.3 1.2 2.9 4.7 19.3	11.1 21.6 20.5 1.2 16.4	7.0 12.9 19.3 4.1 11.7	0.6 8.8 26.9 10.5 5.8	0.0 2.9 14.0 1.2 4.7	 0.6 1.2 2.9 5.3 7.6 7.6 7.6 7.6 12.3 12.4
0.0 0.0 2.8 2.8 21.9 20.6	44.1 42.8 30.0 2.8 58.8 65.0	43.8 38.4 16.2 0.3 41.9 63.4	42.2 26.6 8.4 0.3 21.2 45.0	40.9 38.4 21.9 0.0 29.1 53.8	22.2 22.2 21.9 1.6 54.4 68.8	0.6 2.2 12.5 5.3 18.1 24.7	40.9 56.2 59.1 23.1 69.1	43.8 56.9 60.9 50.3 64.4	44.7 51.2 55.6 55.6 48.8	40.0 2 64.4 2 69.1 2 49.7 2 56.9 2 58.8 2	22.8 47.5 71.2 23.8 77.8 78.1	10.8 27.6 31.0 17.8 16.5 4.0	40.4 40.7 30.0 14.8 18.5 26.3	37.7 28.3 13.8 0.3 9.1 23.6	10.4 6.1 0.0 1.7 4.0	38.4 22.9 5.1 0.3 24.9 46.1	39,4 22,6 20,2 13,5 32,7 42,8	11.4 3 10.1 2 14.8 1 16.5 1 35.0 4 22.6 5	8.7 3 7.6 3 6.8 3 1.4 0 7.1 3 6.6 3	34.7 7 29.0 6 13.8 1 0.3 0 31.6 1 46.8 1	.1 4 .4 2 .0 1 .3 0 .0 1 .3 2	41.1 40 86.3 40 15.5 37 0.0 16 11.4 13 25.9 20	 4 0.0 7 11 0 33 5 32 6 36 2 16 	0.5 .2 31.4 .0 51.1 .4 48.3 .8 51.1 .1 21.3	9.6 64.9 76.6 76.6 66.0 39.4	47.9 6.9 1.1 0.0 1.6 23.9	3.2 62.2 80.3 79.3 79.8 62.2	0.0 34.0 49.5 45.2 60.1 37.8	0.0 0.0 11.7 30 30.9 41 27.7 30 40.4 30 13.3 16	5.3 63.3 5 76.6 9 69.1 9 66.0 0 60.6	50.0 41.0 43.6 39.9 39.4 53.2	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.8 39.9	6.4 5.8 4.1 0.0 6.4 8.8	0.0 2.9 0.6 0.0 20.5 37.4	2.3 0.6 0.0 7.0 7.0	1.8 2.3 0.6 0.0 1.8 2.9	1.8 1.8 0.0 0.0 1.8 7.6	2.3 1.2 2.9 4.7 19.3 7.6	11.1 21.6 20.5 1.2 16.4 7.6	7.0 12.9 19.3 4.1 11.7 5.8	0.6 8.8 26.9 10.5 5.8 3.5	0.0 2.9 14.0 1.2 4.7 1.8	0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.3 12.1 9.9 15.1
0.0 0.0 2.8 2.8 21.9 20.6 14.1	44.1 42.8 30.0 2.8 58.8 65.0 65.0	43.8 38.4 16.2 0.3 41.9 63.4 65.9	42.2 26.6 8.4 0.3 21.2 45.0 48.4	40.9 38.4 21.9 0.0 29.1 53.8 57.5	22.2 22.2 21.9 1.6 54.4 69.7	0.6 2.2 12.5 5.3 18.1 24.7 18.8	40.9 56.2 59.1 23.1 69.1 70.0 63.4	43.8 56.9 60.9 50.3 64.7 64.4	44.7 1 51.2 1 55.6 1 55.6 1 48.8 1 51.9 1	40.0 2 64.4 2 69.1 2 49.7 2 55.9 2 55.8 2	22.8 47.5 71.2 23.8 77.8 78.1	10.8 27.6 31.0 17.8 16.5 4.0 6.7	40.4 40.7 30.0 14.8 18.5 26.3 33.3	37.7 28.3 13.8 0.3 9.1 23.6 35.7	10.4 6.1 0.0 1.7 4.0 7.4	38.4 22.9 5.1 0.3 24.9 46.1 39.1	39.4 22.6 20.2 13.5 32.7 42.8 31.0	11.4 3 10.1 2 14.8 1 16.5 1 35.0 4 22.6 5 4.4 3	8.7 3 7.6 3 6.8 3 1.4 4 7.1 3 6.6 4 1.0 3	34.7 7 29.0 6 13.8 1 0.3 0 31.6 1 46.8 1 38.7 4	.1 4 .4 2 .0 1 .3 0 .3 2 .4 2	40 6.3 40 15.5 37 0.0 16 11.4 13 25.9 20 38.0 32	 4 0.0 7 11 0 33 32 5 32 6 36 36 2 16 0 0.3 	0.5 0.5 0.5 0.5 0.5 0.1 0.5 0.0 0.5 0.5 0.5 0.5 0.5 0.5	9.6 64.9 76.6 76.6 66.0 39.4 0.5	47.9 6.9 1.1 0.0 1.6 23.9 43.6	3.2 62.2 60.3 79.3 79.8 62.2 3.2	0.0 34.0 49.5 45.2 60.1 37.8 0.0	0.0 0.0 11.7 30 30.9 41. 27.7 30 40.4 30 13.3 16 0.0 0.0	5.3 63.3 5 76.6 9 69.1 9 69.1 9 66.0 0 60.6 1.1	50.0 41.0 43.6 39.9 39.4 53.2 46.3	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.6 39.9 1.6 0.5	6.4 5.8 4.1 0.0 6.4 8.8 10.5	0.0 2.9 0.6 0.0 20.5 37.4 37.4	2.3 0.6 0.0 7.0 7.0 7.6	1.8 2.3 0.6 1.8 2.9 1.2	1.8 1.8 0.0 1.8 7.6 5.8	2.3 1.2 2.9 4.7 19.3 7.8 7.6	11.1 21.6 20.5 1.2 16.4 7.6 7.0	7.0 12.9 19.3 4.1 11.7 5.8 8.8	0.6 8.8 26.9 10.5 5.8 3.5 4.7	0.0 2.9 14.0 1.2 4.7 1.8 2.3	0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.3 12.3 9.9 15.3 10.5 26.3
0.0 0.0 2.8 2.8 21.9 20.6 14.1 15.3	44.1 42.8 30.0 2.8 58.8 65.0 65.0 65.0	43.8 38.4 16.2 0.3 41.9 63.4 65.9	42.2 26.6 8.4 0.3 21.2 45.0 48.4 45.0	40.9 38.4 21.9 0.0 29.1 53.8 57.5 56.6	22.2 21.9 1.6 54.4 69.7 54.4	0.6 2.2 12.5 5.3 18.1 24.7 18.8 12.2	40.9 56.2 59.1 23.1 69.1 70.0 63.4 55.9	43.8 56.9 60.9 50.3 54.7 64.4 50.3	44.7 5 51.2 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 51.9 1 51.9 1 51.9 1	40.0 : 69.1 : 49.7 : 56.9 : 58.8 : 58.8 :	22.8 47.5 71.2 23.8 77.8 78.1 73.1	10.8 27.6 31.0 17.8 16.5 4.0 6.7 21.9	40.4 40.7 30.0 14.8 18.5 26.3 33.3 48.1	37.7 28.3 13.8 0.3 9.1 23.6 35.7 39.4	10.4 6.1 0.0 1.7 4.0 7.4 6.1	38.4 22.9 5.1 0.3 24.9 46.1 39.1 25.6	39.4 22.6 20.2 13.5 32.7 42.8 31.0 23.2	11.4 3 10.1 2 14.8 1 16.5 1 35.0 4 22.6 5 4.4 3 5.4 1	8.7 : 7.6 : 6.8 : 1.4 : 6.6 : 1.0 : 9.2 :	34.7 7 29.0 6 13.8 1 0.3 0 31.6 1 46.8 1 38.7 4 16.8 1	1 4 .4 2 .0 1 .3 0 .3 2 .0 3 .0 3 .7 4	40 11.1 40 15.5 37 0.0 16 11.4 13 15.5 20 18.0 32 13.8 51	 4 0.1 7 11 33 32 <l< th=""><th>0.5 .2 31.4 .0 51.1 .4 48.8 .8 51.1 .1 21.3 .5 0.0 .6 25.0</th><th>9.6 64.9 76.6 76.6 66.0 39.4 0.5 44.1</th><th>47.9 6.9 1.1 0.0 1.6 23.9 43.6 32.4</th><th>3.2 62.2 79.3 79.8 62.2 3.2 51.6</th><th>0.0 34.0 49.5 45.2 50.1 37.8 0.0 31.4</th><th>0.0 0.0 11.7 30 30.9 41. 27.7 30 40.4 30 13.3 16 0.0 0.0 12.6 28</th><th>5.3 63.3 5 76.6 9 69.1 9 66.0 0 60.6 1.1 7 37.8</th><th>50.0 41.0 43.6 39.9 39.4 53.2 46.3 3.7</th><th>1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.8 39.9 1.6 0.5 50.0 26.6</th><th>6.4 5.8 4.1 6.4 8.8 10.5 7.6</th><th>0.0 2.9 0.6 20.5 37.4 37.4 9.4</th><th>2.3 0.6 0.0 7.0 7.0 7.6 18.1</th><th>1.8 2.3 0.6 0.0 1.8 2.9 1.2 3.5</th><th>1.8 0.0 0.0 1.8 7.6 5.8 20.5</th><th>2.3 1.2 2.9 4.7 19.3 7.6 7.6 9.9</th><th>11.1 21.6 20.5 1.2 16.4 7.6 7.0 9.9</th><th>7.0 12.9 19.3 4.1 11.7 5.8 8.8 14.6</th><th>0.6 8.8 26.9 10.5 5.8 3.5 4.7 9.4</th><th>0.0 2.9 14.0 1.2 4.7 1.8 2.3 5.8</th><th>0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.4 12.4 9.9 15.4 10.4 26.9 14.6 38.9</th></l<>	0.5 .2 31.4 .0 51.1 .4 48.8 .8 51.1 .1 21.3 .5 0.0 .6 25.0	9.6 64.9 76.6 76.6 66.0 39.4 0.5 44.1	47.9 6.9 1.1 0.0 1.6 23.9 43.6 32.4	3.2 62.2 79.3 79.8 62.2 3.2 51.6	0.0 34.0 49.5 45.2 50.1 37.8 0.0 31.4	0.0 0.0 11.7 30 30.9 41. 27.7 30 40.4 30 13.3 16 0.0 0.0 12.6 28	5.3 63.3 5 76.6 9 69.1 9 66.0 0 60.6 1.1 7 37.8	50.0 41.0 43.6 39.9 39.4 53.2 46.3 3.7	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.8 39.9 1.6 0.5 50.0 26.6	6.4 5.8 4.1 6.4 8.8 10.5 7.6	0.0 2.9 0.6 20.5 37.4 37.4 9.4	2.3 0.6 0.0 7.0 7.0 7.6 18.1	1.8 2.3 0.6 0.0 1.8 2.9 1.2 3.5	1.8 0.0 0.0 1.8 7.6 5.8 20.5	2.3 1.2 2.9 4.7 19.3 7.6 7.6 9.9	11.1 21.6 20.5 1.2 16.4 7.6 7.0 9.9	7.0 12.9 19.3 4.1 11.7 5.8 8.8 14.6	0.6 8.8 26.9 10.5 5.8 3.5 4.7 9.4	0.0 2.9 14.0 1.2 4.7 1.8 2.3 5.8	0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.4 12.4 9.9 15.4 10.4 26.9 14.6 38.9
0.0 0.0 2.8 21.9 20.6 14.1 15.3 14.7	44.1 42.8 30.0 2.8 58.8 65.0 65.0 65.0 65.0	43.8 38.4 16.2 0.3 41.9 63.4 65.9 65.9 59.4	42.2 26.6 8.4 0.3 21.2 45.0 48.4 45.0 38.1	40.9 38.4 21.9 0.0 29.1 53.8 57.5 56.6 62.2	22.2 21.9 1.6 54.4 69.7 64.4 67.8	0.6 2.2 12.5 5.3 18.1 24.7 18.8 12.2 23.1	40.9 56.2 59.1 23.1 69.1 70.0 63.4 55.9 46.9	43.8 - 56.9 : 60.9 : 50.3 : 64.4 - 60.3 : 52.2 - 25.0 :	44.7 1 51.2 1 55.6 1 55.6 1 55.6 1 51.9 1 51.9 1 45.6 1 19.7 1	40.0 2 64.4 2 69.1 2 49.7 2 56.9 2 58.8 2 50.3 2 25.0 2	22.8 47.5 71.2 23.8 77.8 78.1 73.1 65.0	10.8 27.6 31.0 17.8 16.5 4.0 6.7 21.9 29.3	40,4 40,7 30,0 14,6 18,5 26,3 33,3 48,1 37,7	37.7 28.3 13.8 0.3 9.1 23.6 35.7 39.4 27.6	10.4 6.1 0.0 1.7 4.0 7.4 6.1 3.0	38.4 22.9 5.1 0.3 24.9 46.1 39.1 25.6 13.1	39.4 22.6 20.2 13.5 32.7 42.8 31.0 23.2 15.8	11.4 3 10.1 2 14.8 1 16.5 1 35.0 4 4.4 3 5.4 1 13.1 1	8.7 : 7.6 : 6.8 : 1.4 : 6.6 : 1.0 : 9.2 : 7.2 :	34.7 7 29.0 6 13.8 1 0.3 0 31.6 1 46.8 1 38.7 4 16.8 5 7.4 0	.1 4 .4 2 .0 1 .3 0 .3 2 .0 3 .0 3 .7 4 .0 2	H1.1 40 26.3 40 15.5 37 0.0 16 11.4 13 25.9 20 38.0 32 33.8 51 27.6 39	 4 0.0 7 11 11 33 32 32<!--</th--><th>0.5 .2 31.4 .2 51.1 .4 48.5 .6 51.1 .1 21.3 .3 0.0 .4 35.0 .5 0.0 .5 25.0 .3 42.6</th><th>9.6 64.9 76.6 66.0 39.4 0.5 44.1</th><th>47.9 6.9 1.1 0.0 1.6 23.9 43.6 32.4 35.6</th><th>3.2 62-2 80.3 79.3 62.2 3.2 51.6 74.5</th><th>0.0 34.0 49.5 60.1 37.8 0.0 31.4 37.2</th><th>0.0 0.0 11.7 30 30.9 41. 27.7 30 40.4 30 13.3 16 0.0 0.0 12.8 28 35.1 46</th><th> 5.3 63.3 76.6 66.1 66.2 60.6 1.1 37.6 37.6 71.6 </th><th>50.0 41.0 43.6 39.9 39.4 53.2 46.3 3.7 0.0</th><th>1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.8 39.9 1.6 0.5 50.0 26.6 60.0 52.1</th><th>5.4 5.8 4.1 6.4 8.8 10.5 7.6 8.8</th><th>0.0 2.9 0.6 2.0 2.0 20.5 37.4 37.4 37.4 9.4 9.4</th><th>2.3 0.6 0.0 2.0 7.0 7.6 18.1 13.5</th><th>1.8 2.3 0.6 1.8 2.9 1.2 3.5 10.5</th><th>1.8 0.0 0.0 1.8 7.6 20.5 33.3</th><th>2.3 1.2 2.9 4.7 19.3 7.6 7.6 9.9 12.9</th><th>11.1 21.6 20.5 1.2 16.4 7.6 9.9 8.8</th><th>7.0 12.9 19.3 4.1 11.7 5.8 8.8 14.6 11.1</th><th>0.6 8.8 26.9 10.5 5.8 3.5 4.7 9.4 2.9</th><th>0.0 2.9 14.0 1.2 4.7 1.8 2.3 5.8</th><th>0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.3 12.3 9.9 15.3 10.5 26.3 12.4 33.3 2.5 3.4</th>	0.5 .2 31.4 .2 51.1 .4 48.5 .6 51.1 .1 21.3 .3 0.0 .4 35.0 .5 0.0 .5 25.0 .3 42.6	9.6 64.9 76.6 66.0 39.4 0.5 44.1	47.9 6.9 1.1 0.0 1.6 23.9 43.6 32.4 35.6	3.2 62-2 80.3 79.3 62.2 3.2 51.6 74.5	0.0 34.0 49.5 60.1 37.8 0.0 31.4 37.2	0.0 0.0 11.7 30 30.9 41. 27.7 30 40.4 30 13.3 16 0.0 0.0 12.8 28 35.1 46	 5.3 63.3 76.6 66.1 66.2 60.6 1.1 37.6 37.6 71.6 	50.0 41.0 43.6 39.9 39.4 53.2 46.3 3.7 0.0	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.8 39.9 1.6 0.5 50.0 26.6 60.0 52.1	5.4 5.8 4.1 6.4 8.8 10.5 7.6 8.8	0.0 2.9 0.6 2.0 2.0 20.5 37.4 37.4 37.4 9.4 9.4	2.3 0.6 0.0 2.0 7.0 7.6 18.1 13.5	1.8 2.3 0.6 1.8 2.9 1.2 3.5 10.5	1.8 0.0 0.0 1.8 7.6 20.5 33.3	2.3 1.2 2.9 4.7 19.3 7.6 7.6 9.9 12.9	11.1 21.6 20.5 1.2 16.4 7.6 9.9 8.8	7.0 12.9 19.3 4.1 11.7 5.8 8.8 14.6 11.1	0.6 8.8 26.9 10.5 5.8 3.5 4.7 9.4 2.9	0.0 2.9 14.0 1.2 4.7 1.8 2.3 5.8	0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.3 12.3 9.9 15.3 10.5 26.3 12.4 33.3 2.5 3.4
0.0 0.0 2.8 2.8 21.9 20.6 14.1 15.3 14.7 4.4	44.1 42.8 30.0 2.8 65.0 65.0 68.1 66.6 15.0	43.8 38.4 16.2 0.3 41.9 63.4 65.9 65.9 59.4 33.4	42.2 26.6 8.4 0.3 21.2 45.0 48.4 45.0 38.1 32.5	40.9 38.4 21.9 0.0 23.1 53.8 57.5 56.6 62.2 40.6	22.2 21.9 1.6 54.4 69.7 64.4 67.8 25.6	0.6 2.2 12.5 5.3 18.1 24.7 18.8 12.2 23.1 3.1	40.9 3 55.2 3 59.1 3 59.1 3 60.1 3 60.4 3 65.9 3 46.9 3 1.2 3	43.8 - 55.9 : 60.9 : 50.3 : 56.4.7 : 66.3 : 55.2.2 - 25.0 : 0.6 :	44.7 1 51.2 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 48.8 1 51.9 1 45.6 1 19.7 1 0.3 1	40.0 2 64.4 - 69.1 - 69.1 - 56.9 - 55.8.8 - 50.3 - 25.0 - 0.6 -	22.8 47.5 71.2 23.8 77.8 77.8 78.1 73.1 65.0 50.9	10.8 27.6 31.0 17.8 16.5 4.0 6.7 21.9 29.3 13.1	40.4 40.7 30.0 14.8 26.3 33.3 48.1 37.7 6.1	37.7 28.3 13.8 0.3 9.1 23.6 35.7 39.4 27.6 0.0	10.4 6.1 0.0 0.0 1.7 4.0 7.4 6.1 3.0	38.4 22.9 5.1 0.3 24.9 46.1 39.1 25.6 13.1 1.7	39,4 22,6 20,2 13,5 32,7 42,8 31,0 23,2 15,8 13,8	11.4 3 10.1 2 14.8 1 16.5 1 35.0 4 4.4 3 5.4 1 13.1 1 19.5 1	8.7 : 7.6 : 6.8 : 1.4 : 1.0 : 9.2 : 7.2 : 4.1 :	34.7 7 29.0 6 13.8 1 0.3 0 31.6 1 46.8 1 38.7 4 16.8 5 7.4 0 1.0 0	.1 4 .4 2 .0 1 .3 0 .4 2 .5 2 .6 3 .6 3 .7 4 .6 2 .6 2 .7 4	H1.1 40 16.3 40 15.5 37 0.0 16 11.4 13 15.5 20 16.0 32 13.8 51 27.6 39 0.3 11	4 0.0 7 11 33 5 322 18 8 38 8 38 8 38 8 38 8 38 9 39 9 39 9 3	0.5 .2 .2 .1 .0 .1 .4 .51.1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1	9.6 64.9 76.6 66.0 39.4 0.5 44.1 77.7 61.7	47.9 6.9 1.1 0.0 1.6 23.9 43.6 32.4 35.6 35.6	3.2 62.2 79.3 79.8 62.2 3.2 51.6 74.5 60.1	0.0 34.0 49.5 60.1 37.8 0.0 31.4 37.2 28.7	0.0 0.0 11.7 30 30.9 41 27.7 30 40.4 30 13.3 16 0.0 0.0 12.8 28 35.1 46	5.3 63.3 5 76.6 69.1 60.6 1.1 7 37.8 3 71.8 3 73.9	50.0 41.0 43.6 39.9 53.2 46.3 3.7 0.0	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.8 39.9 1.6 0.5 50.0 20.6 80.9 52.1 79.8 54.3	6.4 5.8 4.1 0.0 6.4 8.8 10.5 7.6 8.8 1.2	0.0 2.9 0.6 20.5 37.4 37.4 9.4 9.4 7.6	 2.3 0.6 0.0 0.0 7.0 7.6 18.1 13.5 7.0 	1.8 2.3 0.6 1.8 2.9 1.2 3.5 10.5 2.3	1.8 0.0 0.0 1.8 7.6 20.5 33.3 4.7	2.3 1.2 2.9 4.7 19.3 7.8 9.9 12.9 0.0	11.1 21.6 20.5 1.2 16.4 7.6 9.9 8.8 0.6	7.0 12.9 19.3 4.1 11.7 5.8 8.8 14.6 11.1 6.4	0.6 8.8 26.9 10.5 5.8 3.5 4.7 9.4 2.9 0.0	0.0 2.9 14.0 1.2 4.7 1.8 2.3 5.8 1.8 2.0	0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.3 12.3 9.9 15.3 10.5 26.3 14.6 38.3 2.9 7.0
0.0 0.0 2.8 21.9 20.6 14.1 15.3 14.7 4.4 7.2	44.1 42.8 30.0 58.8 65.0 65.0 65.1 66.6 15.0 60.0	43.8 38.4 16.2 0.3 41.9 63.4 65.9 65.9 59.4 33.4 50.9	42.2 26.6 8.4 0.3 21.2 45.0 48.4 45.0 38.1 32.5 36.2	40.9 38.4 21.9 0.0 29.1 53.8 57.5 56.6 62.2 40.6 45.3	22.2 21.9 1.6 54.4 69.7 64.4 67.8 25.6 65.0	0.6 2.2 12.5 5.3 18.1 24.7 18.8 12.2 23.1 3.1 1.9	40.9 3 55.2 3 59.1 3 59.1 3 63.4 3 55.9 3 46.9 3 1.2 3 25.0 3	43.8 - 55.9 : 60.9 : 64.7 : 64.7 : 64.7 : 55.2 - 55.2 - 25.0 . 0.6 . 27.8 .	44.7 1 51.2 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 48.8 1 51.9 1 45.6 1 19.7 1 0.3 1 13.4 1	40.0 2 64.4 - 69.1 - 56.9 - 58.8 - 50.3 - 50.3 - 50.4 - 50.3 - 50.4 - 50.3 - 50.4 - 50.3 - 50.4 - 50.3 - 50.4 - 50.3 - 50.4 - 50.5 -	22.8 47.5 71.2 23.8 77.8 77.8 78.1 73.1 65.0 50.9 3.4 29.1	10.8 27.6 31.0 17.8 16.5 4.0 6.7 21.9 29.3 13.1 14.5	40.4 40.7 30.0 14.8 26.3 33.3 48.1 37.7 6.1 14.5	37.7 28.3 13.8 0.3 9.1 23.6 35.7 39.4 27.6 0.0 17.5	10.4 6.1 0.0 0.0 1.7 4.0 6.1 6.1 5.0 0.0	38.4 22.9 5.1 0.3 24.9 46.1 39.1 25.6 13.1 1.7 29.0	39.4 22.6 20.2 13.5 32.7 42.8 31.0 23.2 15.8 13.8 45.1	11.4 3 10.1 2 14.8 1 16.5 1 35.0 4 22.6 5 4.4 3 5.4 1 13.1 1 19.5 1 39.1 3	8.7 7.6 6.8 1.4 1.4 1.0 5.6 1.0 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2	34.7 7 29.0 6 13.8 1 0.3 0 331.6 1 46.8 1 38.7 4 16.8 5 1.0 0 1.0 0 1.0 0 1.0 0 1.0 0	.1 4 .4 2 .0 1 .3 0 .3 2 .0 3 .0 3 .0 2 .0 2 .0 2 .0 2 .0 3 .0 2 .0 3 .0 2 .0 2 .0 3 .0 2 .0 3	H.1 40 (6.3 40 (5.5 37 (1.4 13 (5.5) 20 (1.4 13 (5.5) 20 (3.6) 32 (3.8) 51 (3.7) 39 (3.3) 11 (1.4) 25	4 0.0 7 11 33 5 32 5 32 7 18 38 38 38 38 38 38 38 38 38 38 38 38 38	0.5 0.5 2 31.4 48.8 48.8 51.1 21.3 0.0 25.0 25.0 25.0 44.1 42.6 44.1 44.1 44.1	9.6 64.9 76.6 66.0 39.4 0.5 44.1 61.7 61.7 72.3	47.9 6.9 1.1 0.0 1.6 23.9 43.6 35.6 35.6 35.6	3.2 62.2 79.3 79.3 62.2 51.6 74.5 60.1 57.4	0.0 34.0 49.5 45.2 60.1 37.8 0.0 31.4 37.2 28.7 29.3	0.0 0.0 11.7 30 30.9 41 27.7 30 40.4 30 13.3 16 0.0 0.0 12.8 28 35.1 46 36.2 46 36.4 58	5.3 5.3 5 5 6 6 7 6 6 7 6 7 6 7 7 7 7 7 7 7 7 7	50.0 41.0 43.6 39.9 39.4 53.2 46.3 3.7 0.0 0.0 0.0 1.1	1.1 0.0 62.2 21.8 72.9 44.1 60.6 39.9 75.5 53.7 63.8 39.9 1.6 0.5 50.0 26.6 80.9 52.1 79.8 54.3 77.1 54.0	6.4 5.8 4.1 0.0 6.4 8.8 10.5 7.6 8.8 1.2 4.1	0.0 2.9 0.6 20.5 37.4 9.4 9.4 7.6 1.8	2.3 0.6 0.0 7.0 7.0 18.1 13.5 7.0 11.1	1.8 2.3 0.6 1.8 2.9 1.2 3.5 10.5 2.3 7.0	1.8 0.0 0.0 1.8 7.6 20.5 33.3 4.7 9.9	2.3 1.2 2.9 4.7 19.3 7.6 9.9 12.9 0.0 9.9	11.1 21.6 20.5 1.2 16.4 7.6 7.0 9.9 8.8 0.6 3.5	7.0 12.9 19.3 4.1 11.7 5.8 14.6 11.1 6.4 7.0	0.6 8.8 26.9 10.5 5.8 4.7 9.4 2.9 0.0	0.0 2.9 14.0 4.7 1.8 2.3 5.8 1.8 1.8 2.0 0.0	0.6 1.2 2.9 5.3 7.6 7.6 2.3 7.6 12.3 12.3 9.9 15.4 10.4 26.3 14.6 36.3 2.9 7.0 0.0 2.3
0.0 0.0 2.8 2.8 21.9 20.6 14.1 15.3 14.7 4.4 7.2 1.2	44.1 42.8 30.0 2.8 65.0 65.0 68.1 66.6 15.0 60.0 63.7	43.8 38.4 16.2 0.3 41.9 63.4 65.9 65.9 59.4 33.4 50.9 54.1	42.2 26.6 8.4 0.3 21.2 45.0 48.4 45.0 38.1 32.5 36.2 38.4	40.9 38.4 21.9 0.0 29.1 53.8 57.5 56.6 62.2 40.6 45.3 53.8	22.2 21.9 1.6 54.4 69.7 64.4 67.8 25.6 65.0 47.8	0.6 2.2 12.5 5.3 18.1 24.7 18.8 12.2 23.1 3.1 1.9 1.2	40.9 3 56.2 1 59.1 1 23.1 1 63.4 1 70.0 1 63.4 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1 70.0 1	43.8 - 56.9 : 56.9 : 56.9 : 50.3 : 56.4 : 56.7 : 56.8 : 56.3 : 56.4 : 56.4 : 56.7 : 55.2 : 25.0 : 0.6 : 27.8 : 37.5 :	44.7 1 51.2 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.6 1 55.8 1 55.9 1 45.6 1 19.7 1 0.3 1 13.4 1 28.1 1	40.0 2 64.4 2 69.1 3 49.7 3 56.8 3 58.8 3 50.3 4 25.0 3 0.6 3 20.9 3 40.9 3	22.8 47.5 71.2 23.8 77.8 78.1 50.9 50.9 3.4 29.1 35.6	10.8 27.6 31.0 17.8 4.0 21.9 29.3 13.1 14.5 9.8	40.4 40.7 30.0 14.8 26.3 33.3 48.1 37.7 6.1 14.5 25.6	37.7 28.3 13.8 0.3 9.1 23.6 35.7 39.4 27.6 0.0 17.5 33.0	10.4 6.1 0.0 1.7 4.0 7.4 6.1 3.0 0.0 3.7 6.7	38.4 22.9 5.1 0.3 24.9 46.1 39.1 13.1 1.7 29.0 44.8	39,4 22,6 20,2 13,5 32,7 42,8 31,0 23,2 15,8 13,8 45,1 51,2	111.4 3 10.1 2 14.8 1 16.5 1 35.0 4 22.6 5 4.4 3 5.4 1 13.7 1 19.5 1 39.1 3 20.9 4	8.7 7.6 6.8 1.4 6.8 7.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	334.7 7 229.0 6 13.8 1 13.8 1 0.3 0 31.6 1 38.7 4 16.8 1 1.0.0 0 11.0 0 1.0.0 0 1.0.0 0 229.6 0	.1 4 .4 2 .0 1 .3 0 .3 2 .0 3 .3 2 .3 2 .3 2 .3 2 .3 2 .3 3 .3 1 .3 3	H.1. 40 40.3 40 40.5. 40 40.5.5 37 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16 40.0 16	 4 0.1 7 111 111 32 32	0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	9.6 64.9 76.6 66.0 39.4 44.1 61.7 61.7 72.3 72.3	47.9 6.9 1.1 2.3 43.6 32.4 35.6 35.6 43.1 41.0	 3.2 62.2 79.3 79.3 62.2 3.2 51.6 74.5 60.1 57.4 52.1 	0.0 34.0 49.5 45.2 60.1 37.8 0.0 31.4 37.2 28.7 29.3 13.8	0.0 0.0 11.7 30 30.9 41. 27.7 30 40.4 30 13.3 16 0.0 0.0 12.6 28 35.1 46 36.7 58 9.0 36	5.3 5.3 5 5 6 6 .3 6 .3 6 .4 6 .4 6 .4 6 .4 6 .4 7 .4 7 .4 7 .4	50.0 41.0 43.6 39.9 53.2 46.3 5.7 0.0 0.0 1.1 25.5	1.1 0.0 12.2 21.8 72.9 41.1 60.6 30.9 75.5 53.7 63.8 30.9 1.6 0.5 50.0 20.6 60.4 50.0 60.5 50.0 60.6 54.3 77.1 58.0 64.9 28.7	6.4 5.8 4.1 0.0 6.4 8.8 10.5 7.6 8.8 1.2 4.1 5.8	0.0 2.9 0.6 20.5 37.4 7.6 7.6 3.5	2.3 0.6 0.0 7.0 7.0 7.6 18.1 13.5 7.0 11.1 5.3	1.8 2.3 0.6 1.0 2.9 1.2 3.5 10.5 2.3 7.0 3.5	1.8 1.8 0.0 1.8 7.6 20.5 33.3 4.7 9.9 2.9	2.3 1.2 2.9 4.7 19.3 7.6 9.9 12.9 0.0 9.9 6.4	11.1 21.6 20.5 1.2 16.4 7.6 9.9 8.8 0.6 3.5 9.4	7.0 12.9 19.3 4.1 11.7 5.8 8.8 14.6 11.1 6.4 7.0 2.9	0.6 8.8 26.9 10.5 5.8 3.5 4.7 9.4 2.9 0.0 0.0	0.0 2.9 14.0 1.2 4.7 1.8 2.3 5.8 1.8 0.0 0.6 1.2	0.6 1.2 2.9 5.3 7.6 7.6 2.3 0.0 12.3 12.3 9.9 15.1 10.5 26.3 1.4 38.3 2.9 7.0 0.0 2.3 0.0 2.3 0.6 2.3 1.2 1.2

(b) The view-visiting frequencies and their corresponding single view accuracy during training of [2] which does not address the *lingering* problem.

Figure 2. A comparison between the proposed method and the baseline who does not consider the *lingering* problem on the ShapeNet dataset [1]. We discretize the viewing sphere for each object as a 12×12 grid. Then, the visiting frequencies of views by heatmaps on different categories are demonstrated. The training accuracy of views is accordingly marked on each grid. Note that we normalize each heatmap separately.



Figure 3. The classifier activations of the correct category over steps on both the ShapeNet [1] and the SUN360 dataset [3].