

## A Existing Noise Models

Let  $\mathcal{G} = (\mathcal{V}, \mathcal{E})$  be a graph where each node belongs to one of  $K$  classes. Three methods are generally adopted to add noise to the node labels; details about these three methods follow:

### A.1 Symmetric Label Noise

Symmetric Label Noise (SLN) [8, 4] assumes that the label of a node is changed with some fixed probability  $\rho$  (and hence retained with probability  $1 - \rho$ ). Also, the probability of a label being assigned to each of the classes is the same, which is  $\rho/(K-1)$ . Mathematically, if  $y$  and  $y'$  denote true and noisy label respectively, then  $P(y' = n | y = m) = \frac{\rho}{K-1}$ , where  $n, m$  belongs to set of all labels and  $m \neq n$ . Transition probability matrix for SLN is given by

$$Q = \begin{bmatrix} 1 - \rho & \frac{\rho}{K-1} & \frac{\rho}{K-1} & \cdots & \frac{\rho}{K-1} \\ \frac{\rho}{K-1} & 1 - \rho & \frac{\rho}{K-1} & & \frac{\rho}{K-1} \\ \vdots & & \ddots & \ddots & \vdots \\ \frac{\rho}{K-1} & & & 1 - \rho & \frac{\rho}{K-1} \\ \frac{\rho}{K-1} & \frac{\rho}{K-1} & \cdots & \frac{\rho}{K-1} & 1 - \rho \end{bmatrix}$$

### A.2 Class Conditional Noise

In Class Conditional Noise (CCN), the probability with which the label is changed depends on both  $y$  and  $y'$ . The probability of a node of class  $m$  being reassigned to class  $n$  is given by  $\rho_{mn}$  ( $P(y' = n | y = m) = \rho_{mn}$ ), where  $m \neq n$ . So, a node with label  $m$  is flipped with probability  $\rho_m = \sum_{i=1}^K \rho_{mi}$ ;  $i \neq m$  and the label is retained with the probability  $1 - \rho_m$ . This is also referred to as random noise and asymmetric noise. The transition probability matrix is given by

$$Q = \begin{bmatrix} 1 - \rho_1 & \rho_{12} & \rho_{13} & \cdots & \rho_{1K} \\ \rho_{21} & 1 - \rho_2 & \rho_{23} & & \rho_{2K} \\ \vdots & & \ddots & \ddots & \vdots \\ \rho_{(K-1)1} & & & 1 - \rho_{K-1} & \rho_{(K-1)K} \\ \rho_{K1} & \rho_{K2} & \cdots & \rho_{K(K-1)} & 1 - \rho_K \end{bmatrix}$$

#### A.2.1 Pairwise Noise

Pairwise Noise is a special class of Class Conditional Noise. The motivation behind Pairwise Noise is that one is more likely to mislabel two similar classes. For Pairwise Noise  $\rho_1 = \rho_2 = \cdots = \rho_K = \rho$ , and the label is flipped to the next label (with probability  $\rho$ ). The transition probability matrix is given by

$$Q = \begin{bmatrix} 1-\rho & \rho & 0 & \dots & 0 \\ 0 & 1-\rho & \rho & & 0 \\ \vdots & & \ddots & \ddots & \vdots \\ 0 & & & 1-\rho & \rho \\ \rho & 0 & \dots & 0 & 1-\rho \end{bmatrix}$$

## B Derivation for Sequential flipping

For a given dataset having  $K$  **classes**, we are interested in finding the probability with which the label of a node of **degree**  $n$  is changed. We assumed that the probability of transitioning between any two classes is uniform. So, when  $\rho$  is the probability of calling an edge noisy, the transition probability matrix due to an edge is given by

$$Q = \begin{bmatrix} 1-\rho & \frac{\rho}{K-1} & \frac{\rho}{K-1} & \dots & \frac{\rho}{K-1} \\ \frac{\rho}{K-1} & 1-\rho & \frac{\rho}{K-1} & & \frac{\rho}{K-1} \\ \vdots & & \ddots & \ddots & \vdots \\ \frac{\rho}{K-1} & & & 1-\rho & \frac{\rho}{K-1} \\ \frac{\rho}{K-1} & \frac{\rho}{K-1} & \dots & \frac{\rho}{K-1} & 1-\rho \end{bmatrix}$$

For ease of notation let  $p = \frac{\rho}{K-1}$ , the matrix get modified to

$$Q = \begin{bmatrix} 1-(K-1)p & p & p & \dots & p \\ p & 1-(K-1)p & p & & p \\ \vdots & & \ddots & \ddots & \vdots \\ p & & & 1-(K-1)p & p \\ p & p & \dots & p & 1-(K-1)p \end{bmatrix}$$

As the label is getting sequentially updated for every incident edge, the transition probability matrix for a node with degree  $n$  is  $Q^n$ . As  $Q$  is a symmetric matrix, we will try to diagonalize the matrix in order to find a closed-form solution for  $Q^n$ . Observe that the sum of every row of the matrix  $Q$  is the same, and they sum up to 1. This means one of the eigenvectors is  $v_1 = \frac{1}{\sqrt{K}}[1, 1, \dots, 1]$  for eigenvalue  $\lambda_1 = 1$ . To find other eigenvalues, let  $v = [x_1, \dots, x_K]$  be an eigenvector of  $Q$ , then it satisfies

$$(1 - (K-1)p)x_i + p(x_1 + x_2 + \dots + x_k - x_i) = \lambda x_i, \quad i = 1, \dots, k$$

As  $Q$  is a symmetric matrix, so all other eigenvectors must be orthogonal to  $v_1$ . Hence,  $x_1 + \dots + x_K = 0$ , and

$$(1 - Kp)x_i = \lambda x_i, \quad i = 1, \dots, k$$

This means  $(1 - Kp)$  is an eigenvalue for  $Q$ . Eigenvector corresponding to this eigenvalue satisfies  $Q - (1 - Kp)I = 0$ , that is

$$Q = \begin{bmatrix} p & p & p & \dots & p \\ p & p & p & & p \\ \vdots & & \ddots & \ddots & \vdots \\ p & & & p & p \\ p & p & \dots & p & p \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_{K-1} \\ x_K \end{bmatrix} = 0$$

As the solution space of given system of equation have  $k - 1$  dimension, so we obtain  $k - 1$  linearly independent eigenvectors given by

$$v_2 = \frac{1}{\sqrt{2}}[1, -1, 0, 0, \dots, 0, 0],$$

$$v_3 = \frac{1}{\sqrt{6}}[1, 1, -2, 0, \dots, 0, 0],$$

$$v_4 = \frac{1}{\sqrt{12}}[1, 1, 1, -3, 0, \dots, 0, 0],$$

$\vdots$

$$v_k = \frac{1}{\sqrt{(K-1)K}}[1, 1, 1, 1, \dots, 1, -(k-1)]$$

Again, as  $Q$  is a symmetric matrix using eigen decomposition of a symmetric matrix, assuming eigenvectors are row vectors

$$Q^n = \sum_{i=1}^K \lambda_i^n v_i^\top v_i$$

Separating the term corresponding to  $\lambda = 1$  gives

$$\begin{aligned} Q^n &= \frac{1}{K} \begin{bmatrix} 1 & 1 & 1 & \dots & 1 \\ 1 & 1 & 1 & & 1 \\ \vdots & & \ddots & \ddots & \vdots \\ 1 & & & 1 & 1 \\ 1 & 1 & \dots & 1 & 1 \end{bmatrix} + \sum_{i=2}^K \lambda_i^n v_i^\top v_i \\ &= \frac{1}{K} \begin{bmatrix} 1 & 1 & 1 & \dots & 1 \\ 1 & 1 & 1 & & 1 \\ \vdots & & \ddots & \ddots & \vdots \\ 1 & & & 1 & 1 \\ 1 & 1 & \dots & 1 & 1 \end{bmatrix} + (1 - Kp)^n \begin{bmatrix} | & | & \dots & | \\ v_2 & v_3 & \dots & v_K \\ | & | & \dots & | \end{bmatrix} \begin{bmatrix} -v_2- \\ -v_3- \\ \vdots \\ -v_K- \end{bmatrix} \\ &= \frac{1}{K} \begin{bmatrix} 1 & 1 & 1 & \dots & 1 \\ 1 & 1 & 1 & & 1 \\ \vdots & & \ddots & \ddots & \vdots \\ 1 & & & 1 & 1 \\ 1 & 1 & \dots & 1 & 1 \end{bmatrix} + (1 - Kp)^n \begin{bmatrix} \frac{K-1}{K} & -\frac{1}{K} & -\frac{1}{K} & \dots & -\frac{1}{K} \\ -\frac{1}{K} & \frac{k-1}{K} & -\frac{1}{K} & & -\frac{1}{K} \\ \vdots & & \ddots & \ddots & \vdots \\ -\frac{1}{K} & & & \frac{k-1}{K} & -\frac{1}{K} \\ -\frac{1}{K} & -\frac{1}{K} & \dots & -\frac{1}{K} & \frac{k-1}{K} \end{bmatrix} \end{aligned}$$

Now, using our original notation  $\rho = (K - 1)p$ . Using  $Q^n$ , starting with the true label  $y_i$ , the probability of the label being changed to a specific class is

given by

$$s_{sc}(n) = \frac{1}{K} \left( 1 - \left( 1 - \frac{K\rho}{K-1} \right)^n \right).$$

For a node of degree  $n$ , the probability of its label being flipped is  $(K-1) \times s_{sc}(n)$  and is hence given by

$$s(n) = \frac{K-1}{K} \left( 1 - \left( 1 - \frac{K\rho}{K-1} \right)^n \right).$$

## C Proof of Theorem 1

*Proof.* As  $n$  denotes the degree of node, and hence can take only natural numbers, so we will prove all property only for natural values of  $n$ .

1.  $r(n)$  and  $s(n)$  are increasing function of  $n$ .  $q(2n)$  and  $q(2n+1)$  are decreasing function of  $n$ .

**For  $r(n)$  :** Let  $m > n$  be two natural numbers, as  $(1-\rho) \leq 1$  for  $\rho \in [0, 1]$ , so,  $(1-\rho)^m < (1-\rho)^n$ . Hence,  $1 - (1-\rho)^m > 1 - (1-\rho)^n$ . Hence,  $r(n)$  is an increasing function of  $n$ .

**For  $s(n)$  :** If  $\rho > \frac{K-1}{K}$ , then for a single flip the probability with which a node with original label  $i$  remains in  $i$  is  $1 - \rho < \frac{1}{K}$ . Also, the probability with which it gets reassigned as  $K$  is  $\frac{\rho}{K-1} > \frac{1}{K}$ . This means the probability of moving to any specific class is more than the probability of retaining the label, which completely changes the distribution of the data, and hence is not a desirable situation. From the perspective of label noise, we are interested in only  $r < \frac{K-1}{K}$ . with  $\rho < \frac{k-1}{k}$ ,  $\left( 1 - \frac{K\rho}{K-1} \right) < 1$ , and proof similar to  $s(n)$  follows.

2.  $r(n) \geq q(n) \forall n$ .

We can see

$$r(n) = \sum_{k=1}^n \binom{n}{k} p^k (1-p)^{n-k} \geq \sum_{k=\lceil \frac{n}{2} \rceil}^n \binom{n}{k} p^k (1-p)^{n-k} = q(n)$$

3. If  $\rho < \frac{K-1}{K}$ , then  $s(n) < \frac{K-1}{K}$  and  $s(n) = \frac{K-1}{K}$  iff  $\rho = \frac{K-1}{K}$

If  $\rho < \frac{K-1}{K}$ , then  $\left( 1 - \frac{K\rho}{K-1} \right)^n < 1$ , and hence  $1 - \left( 1 - \frac{K\rho}{K-1} \right)^n < 1$ . Which finally means  $s(n) < \frac{K-1}{K}$ .

Now, to prove the second part of the statement, let  $\rho = \frac{K-1}{K}$ ,

$$\Leftrightarrow s(n) = \frac{K-1}{K} \left( 1 - \left( 1 - \frac{K \times (K-1)}{(K-1) \times K} \right)^n \right) = \frac{K-1}{K}$$

□

## D Datasets

### D.1 Dataset Statistics

Table 1: Dataset Statistics

Dataset	# Nodes	# Edges	Feature dim	# Classes
Cora	2,708	10,556	1,433	7
CiteSeer	3,327	9,104	3,703	6
Amazon Photo	7,650	238,162	745	8

**Dataset split details:** For experiment we use split similar to [6]. For the Cora dataset, we use 172 nodes per class for training, 500 nodes for validation, and 1000 nodes for testing. For Citeseer dataset we use 250 randomly sampled nodes per class for training, 500 nodes for validation, and 1000 nodes for testing. For the Amazon Photo dataset, we use 54 nodes per class for training, 500 nodes in total for validation and the rest of the nodes for testing. All datasets have been fetched from the Pytorch Geometric library, with feature normalisation being true.

### D.2 $\rho$ Values for Different Datasets

The value of  $\rho$  corresponding to different noise levels for Cora, Citeseer and Amazon Photo datasets is included in Table 2. Code to calculate  $\rho$  value for other sets is available in the included code.

## E Detailed Results

### E.1 Implementation Details about GNN Architectures and Noise Robust Algorithm

GCN, GraphSage, GAT and Graph Transformer have been implemented using Pytorch Geometric using GCNConv, SAGEConv, GATConv and TransformerConv respectively. For GCN and GraphSage we use 1 hidden layer of size 16 and relu activation. For GAT and Graph Transformer we use 1 hidden layer with 8 heads of size 8. For GIN we use implementation by [8]. It is worth mentioning that the comparison is not between GNNs but between different noise models, so using slightly different architectures for different GNNs strengthens our experiments.

We use implementation by [8] for all noise-robust algorithms except for DeGLIF for, which we use implementation by [6].

Table 2:  $\rho$  values for different noise levels for Cora, Citeseer and Amazon Photo dataset

Dataset	Noise Level	Majority Vote	Veto Power	Sequential
Cora	5%	0.07121424	0.01360272	0.01360272
	10%	0.12862573	0.02840568	0.02880576
	15%	0.17803561	0.04460892	0.04540908
	20%	0.22224445	0.0620124	0.06381276
	25%	0.26265253	0.08081616	0.08381676
	30%	0.30046009	0.10122024	0.10582116
	35%	0.33626725	0.12342468	0.13002601
	40%	0.37087417	0.14742949	0.15703141
	45%	0.4044809	0.17383477	0.18723745
	50%	0.43768754	0.20284057	0.22144429
Citeseer	5%	0.05481096	0.01920384	0.01940388
	10%	0.10622124	0.04020804	0.0410082
	15%	0.15423085	0.06321264	0.06481296
	20%	0.19983997	0.0880176	0.09121824
	25%	0.24324865	0.115023	0.12022404
	30%	0.28505701	0.14422885	0.15223045
	35%	0.32526505	0.17603521	0.18783757
	40%	0.36467293	0.21064213	0.22704541
	45%	0.4034807	0.24824965	0.27065413
	50%	0.44188838	0.28925785	0.31926385
Amazon Photo	5%	0.24724945	0.00180036	0.00180036
	10%	0.32086417	0.00380076	0.00380076
	15%	0.36227245	0.0060012	0.00620124
	20%	0.39087818	0.00840168	0.00880176
	25%	0.41308262	0.01120224	0.01180236
	30%	0.43168634	0.01440288	0.01540308
	35%	0.44788958	0.01820364	0.01960392
	40%	0.46269254	0.02240448	0.02460492
	45%	0.47629526	0.02720544	0.03040608
	50%	0.48929786	0.0330066	0.03780756

## E.2 Comparison of Noise Model Variants across GNN Architectures

Table 3: Comparison of noise model variants across GNN architecture for Cite-seer dataset. Reported values are accuracy  $\pm$  std of 10 repetitions

GNN Architecture	Noise Level	SLN	Majority Vote +SLN	Veto Power +SLN	Sequential Flipping	CCN	Majority Vote +CCN	Veto Power +CCN
GCN	5%	73.92 $\pm$ 1.07	72.64 $\pm$ 0.47	72.27 $\pm$ 0.70	72.34 $\pm$ 0.58	73.99 $\pm$ 0.99	72.91 $\pm$ 0.60	72.24 $\pm$ 0.63
	10%	72.23 $\pm$ 1.35	71.47 $\pm$ 0.97	70.39 $\pm$ 0.84	70.19 $\pm$ 0.92	72.18 $\pm$ 1.18	71.35 $\pm$ 1.00	69.99 $\pm$ 0.90
	15%	70.17 $\pm$ 1.47	71.50 $\pm$ 0.99	70.42 $\pm$ 0.81	70.23 $\pm$ 0.90	70.04 $\pm$ 1.51	71.36 $\pm$ 1.00	69.98 $\pm$ 0.87
	20%	68.09 $\pm$ 1.59	67.59 $\pm$ 1.39	65.07 $\pm$ 1.12	65.02 $\pm$ 1.32	67.15 $\pm$ 1.74	66.84 $\pm$ 1.45	63.04 $\pm$ 1.60
	25%	65.55 $\pm$ 1.74	65.34 $\pm$ 1.20	61.64 $\pm$ 1.43	61.79 $\pm$ 1.42	64.29 $\pm$ 1.91	63.93 $\pm$ 1.22	58.42 $\pm$ 1.76
	30%	62.49 $\pm$ 2.06	65.34 $\pm$ 1.17	61.63 $\pm$ 1.47	61.81 $\pm$ 1.41	60.43 $\pm$ 2.21	63.90 $\pm$ 1.23	58.41 $\pm$ 1.76
	35%	59.34 $\pm$ 2.76	62.38 $\pm$ 1.46	57.69 $\pm$ 1.72	58.03 $\pm$ 1.50	56.44 $\pm$ 2.60	60.74 $\pm$ 1.73	53.31 $\pm$ 2.30
	40%	56.17 $\pm$ 2.28	55.76 $\pm$ 1.70	48.50 $\pm$ 2.58	49.65 $\pm$ 2.46	51.85 $\pm$ 2.21	52.48 $\pm$ 1.66	42.91 $\pm$ 2.22
	45%	52.47 $\pm$ 2.39	52.33 $\pm$ 1.55	43.86 $\pm$ 2.21	45.57 $\pm$ 2.21	47.30 $\pm$ 2.34	47.36 $\pm$ 1.25	37.93 $\pm$ 2.02
	50%	48.81 $\pm$ 2.58	48.33 $\pm$ 1.63	38.71 $\pm$ 1.81	41.39 $\pm$ 2.54	41.89 $\pm$ 2.28	41.93 $\pm$ 1.80	33.23 $\pm$ 2.08
GIN	5%	71.92 $\pm$ 4.50	69.52 $\pm$ 1.93	68.59 $\pm$ 2.76	67.76 $\pm$ 3.35	67.99 $\pm$ 3.27	68.56 $\pm$ 3.01	68.78 $\pm$ 2.22
	10%	66.94 $\pm$ 2.70	68.34 $\pm$ 2.73	65.13 $\pm$ 3.81	63.48 $\pm$ 8.73	66.69 $\pm$ 4.17	66.29 $\pm$ 4.12	61.95 $\pm$ 9.74
	15%	66.22 $\pm$ 3.43	68.34 $\pm$ 2.73	65.13 $\pm$ 3.81	63.48 $\pm$ 8.73	63.60 $\pm$ 3.12	66.86 $\pm$ 3.55	62.92 $\pm$ 9.88
	20%	64.82 $\pm$ 3.76	64.42 $\pm$ 2.45	56.81 $\pm$ 5.62	56.84 $\pm$ 4.40	59.31 $\pm$ 3.31	62.91 $\pm$ 3.28	56.77 $\pm$ 5.64
	25%	60.12 $\pm$ 5.71	63.39 $\pm$ 3.58	54.51 $\pm$ 4.01	55.42 $\pm$ 6.26	54.22 $\pm$ 9.29	61.47 $\pm$ 3.51	49.34 $\pm$ 7.72
	30%	55.98 $\pm$ 3.94	63.39 $\pm$ 3.58	53.78 $\pm$ 5.67	55.69 $\pm$ 6.13	53.14 $\pm$ 6.02	61.67 $\pm$ 3.13	49.34 $\pm$ 7.72
	35%	55.28 $\pm$ 5.92	61.74 $\pm$ 2.73	46.11 $\pm$ 5.54	49.90 $\pm$ 6.51	48.10 $\pm$ 3.36	56.05 $\pm$ 5.91	45.41 $\pm$ 7.25
	40%	51.04 $\pm$ 6.90	54.35 $\pm$ 3.15	40.40 $\pm$ 7.99	41.89 $\pm$ 6.24	44.71 $\pm$ 7.95	46.04 $\pm$ 4.67	37.49 $\pm$ 5.99
	45%	42.29 $\pm$ 8.80	47.87 $\pm$ 7.42	37.98 $\pm$ 5.40	39.28 $\pm$ 5.53	39.19 $\pm$ 3.55	46.07 $\pm$ 6.53	34.25 $\pm$ 5.86
	50%	42.18 $\pm$ 9.75	42.64 $\pm$ 11.5	31.57 $\pm$ 3.23	33.92 $\pm$ 6.21	36.21 $\pm$ 6.22	38.58 $\pm$ 5.08	28.98 $\pm$ 5.36
GRAPHSage	5%	75.95 $\pm$ 0.96	74.96 $\pm$ 0.51	74.69 $\pm$ 0.49	74.61 $\pm$ 0.62	75.97 $\pm$ 0.88	75.07 $\pm$ 0.56	74.00 $\pm$ 0.53
	10%	74.75 $\pm$ 0.99	74.13 $\pm$ 0.82	73.53 $\pm$ 0.74	73.61 $\pm$ 0.79	74.82 $\pm$ 0.99	74.20 $\pm$ 0.68	72.76 $\pm$ 0.76
	15%	73.87 $\pm$ 1.10	74.18 $\pm$ 0.83	73.55 $\pm$ 0.76	73.57 $\pm$ 0.75	73.35 $\pm$ 1.36	74.15 $\pm$ 0.72	72.71 $\pm$ 0.78
	20%	72.78 $\pm$ 1.21	72.20 $\pm$ 1.10	70.95 $\pm$ 1.11	70.95 $\pm$ 1.03	71.45 $\pm$ 1.44	70.93 $\pm$ 1.20	67.41 $\pm$ 1.19
	25%	70.96 $\pm$ 1.49	70.70 $\pm$ 1.07	68.42 $\pm$ 1.36	68.99 $\pm$ 0.91	68.93 $\pm$ 1.92	68.33 $\pm$ 1.07	63.27 $\pm$ 1.43
	30%	68.82 $\pm$ 1.64	70.75 $\pm$ 1.11	68.34 $\pm$ 1.29	68.97 $\pm$ 0.85	65.25 $\pm$ 2.39	68.34 $\pm$ 1.14	63.33 $\pm$ 1.38
	35%	66.26 $\pm$ 2.10	68.77 $\pm$ 1.30	66.03 $\pm$ 1.49	66.43 $\pm$ 0.83	60.78 $\pm$ 3.35	64.72 $\pm$ 1.42	58.59 $\pm$ 1.77
	40%	63.58 $\pm$ 1.99	63.62 $\pm$ 1.31	57.76 $\pm$ 1.89	58.64 $\pm$ 1.72	55.92 $\pm$ 3.13	55.35 $\pm$ 1.78	47.32 $\pm$ 2.22
	45%	59.61 $\pm$ 1.99	59.97 $\pm$ 1.79	52.89 $\pm$ 2.11	54.17 $\pm$ 2.08	49.71 $\pm$ 2.85	49.19 $\pm$ 1.56	41.19 $\pm$ 2.29
	50%	55.60 $\pm$ 2.01	55.31 $\pm$ 2.26	47.49 $\pm$ 2.23	49.52 $\pm$ 2.86	43.99 $\pm$ 2.57	42.40 $\pm$ 2.33	35.28 $\pm$ 2.33
GAT	5%	76.46 $\pm$ 1.53	74.75 $\pm$ 0.67	74.33 $\pm$ 0.89	74.36 $\pm$ 0.67	76.62 $\pm$ 1.49	74.93 $\pm$ 0.85	74.39 $\pm$ 0.66
	10%	75.65 $\pm$ 1.56	74.29 $\pm$ 0.82	73.88 $\pm$ 1.12	73.93 $\pm$ 0.88	76.22 $\pm$ 1.46	74.39 $\pm$ 0.83	73.75 $\pm$ 0.74
	15%	75.38 $\pm$ 1.66	74.18 $\pm$ 0.77	73.84 $\pm$ 1.09	73.88 $\pm$ 0.92	75.77 $\pm$ 1.45	74.36 $\pm$ 0.79	73.76 $\pm$ 0.69
	20%	75.10 $\pm$ 1.46	73.59 $\pm$ 1.13	72.88 $\pm$ 1.38	72.77 $\pm$ 1.16	74.72 $\pm$ 1.39	72.96 $\pm$ 1.10	71.84 $\pm$ 0.99
	25%	74.59 $\pm$ 1.61	73.06 $\pm$ 1.04	71.81 $\pm$ 1.06	72.16 $\pm$ 1.39	73.31 $\pm$ 1.84	71.32 $\pm$ 1.50	68.13 $\pm$ 1.45
	30%	73.71 $\pm$ 1.60	73.15 $\pm$ 1.13	71.87 $\pm$ 1.16	72.16 $\pm$ 1.40	71.04 $\pm$ 2.33	71.40 $\pm$ 1.53	68.18 $\pm$ 1.41
	35%	73.15 $\pm$ 1.51	72.88 $\pm$ 1.50	71.47 $\pm$ 1.04	71.30 $\pm$ 1.37	67.48 $\pm$ 2.75	68.86 $\pm$ 2.02	64.05 $\pm$ 2.02
	40%	72.47 $\pm$ 1.46	71.82 $\pm$ 2.04	68.75 $\pm$ 2.25	69.10 $\pm$ 1.42	62.03 $\pm$ 3.60	60.98 $\pm$ 3.01	50.85 $\pm$ 2.81
	45%	70.88 $\pm$ 1.64	70.45 $\pm$ 1.81	66.60 $\pm$ 2.33	67.51 $\pm$ 1.87	55.00 $\pm$ 3.75	53.93 $\pm$ 2.64	43.41 $\pm$ 3.18
	50%	70.25 $\pm$ 2.67	69.21 $\pm$ 1.72	63.27 $\pm$ 3.02	65.30 $\pm$ 3.78	45.96 $\pm$ 3.47	45.14 $\pm$ 3.37	35.28 $\pm$ 3.14
TransformerConv	5%	76.28 $\pm$ 0.86	75.64 $\pm$ 0.52	76.28 $\pm$ 0.50	76.54 $\pm$ 0.54	76.10 $\pm$ 1.40	75.50 $\pm$ 0.14	76.16 $\pm$ 0.35
	10%	74.68 $\pm$ 0.74	74.34 $\pm$ 0.63	74.92 $\pm$ 0.72	74.54 $\pm$ 1.13	75.18 $\pm$ 0.34	74.56 $\pm$ 0.40	74.76 $\pm$ 0.65
	15%	73.78 $\pm$ 1.29	74.34 $\pm$ 0.78	74.98 $\pm$ 0.64	74.56 $\pm$ 0.96	73.60 $\pm$ 0.86	74.72 $\pm$ 0.54	74.64 $\pm$ 0.55
	20%	72.48 $\pm$ 1.80	71.52 $\pm$ 0.75	71.02 $\pm$ 1.33	71.58 $\pm$ 1.28	70.92 $\pm$ 0.90	70.70 $\pm$ 0.97	69.24 $\pm$ 1.16
	25%	70.24 $\pm$ 1.63	70.36 $\pm$ 0.60	68.84 $\pm$ 0.68	68.68 $\pm$ 0.86	68.86 $\pm$ 1.03	67.48 $\pm$ 1.12	64.94 $\pm$ 0.68
	30%	67.68 $\pm$ 1.06	70.40 $\pm$ 0.51	69.14 $\pm$ 1.06	68.56 $\pm$ 0.72	64.62 $\pm$ 2.29	67.56 $\pm$ 0.99	64.92 $\pm$ 0.91
	35%	65.40 $\pm$ 1.00	68.06 $\pm$ 1.22	66.96 $\pm$ 1.55	67.48 $\pm$ 1.55	58.90 $\pm$ 1.81	63.78 $\pm$ 1.55	60.06 $\pm$ 1.62
	40%	61.62 $\pm$ 0.64	63.44 $\pm$ 0.81	57.02 $\pm$ 0.80	58.02 $\pm$ 1.03	54.64 $\pm$ 2.01	54.70 $\pm$ 2.89	47.72 $\pm$ 0.43
	45%	58.10 $\pm$ 1.24	59.22 $\pm$ 1.42	52.38 $\pm$ 0.60	53.58 $\pm$ 0.94	49.04 $\pm$ 2.25	48.94 $\pm$ 2.43	43.00 $\pm$ 1.01
	50%	52.88 $\pm$ 0.35	53.68 $\pm$ 2.05	46.20 $\pm$ 0.72	47.94 $\pm$ 1.25	43.32 $\pm$ 0.77	42.36 $\pm$ 2.06	35.64 $\pm$ 1.04

Table 4: Comparison of noise model variants across GNN architecture for Cora dataset. Reported values are accuracy  $\pm$  std of 10 repetitions

GNN Architecture	Noise Level	SLN	Majority Vote +SLN	Veto Power +SLN	Sequential Flipping	CCN	Majority Vote +CCN	Veto Power +CCN
GCN	5%	84.73 $\pm$ 0.94	85.00 $\pm$ 0.44	85.19 $\pm$ 0.74	85.09 $\pm$ 0.73	84.27 $\pm$ 0.98	85.36 $\pm$ 0.48	85.36 $\pm$ 0.50
	10%	83.03 $\pm$ 1.14	83.90 $\pm$ 0.69	83.46 $\pm$ 0.69	83.44 $\pm$ 0.80	82.08 $\pm$ 1.53	83.60 $\pm$ 1.00	82.41 $\pm$ 1.09
	15%	81.08 $\pm$ 1.48	83.92 $\pm$ 0.71	83.51 $\pm$ 0.63	83.47 $\pm$ 0.76	79.21 $\pm$ 1.82	83.62 $\pm$ 1.00	82.40 $\pm$ 1.07
	20%	79.06 $\pm$ 1.46	80.38 $\pm$ 1.32	78.37 $\pm$ 1.58	78.49 $\pm$ 1.47	75.76 $\pm$ 1.75	78.38 $\pm$ 2.04	74.45 $\pm$ 1.68
	25%	76.46 $\pm$ 1.48	77.46 $\pm$ 1.99	74.49 $\pm$ 2.09	74.65 $\pm$ 2.03	71.97 $\pm$ 1.77	74.84 $\pm$ 2.58	68.85 $\pm$ 2.30
	30%	73.68 $\pm$ 1.50	77.51 $\pm$ 1.99	74.50 $\pm$ 2.01	74.64 $\pm$ 2.04	67.67 $\pm$ 1.98	74.90 $\pm$ 2.57	68.81 $\pm$ 2.29
	35%	70.41 $\pm$ 1.76	74.79 $\pm$ 2.24	71.08 $\pm$ 1.97	71.36 $\pm$ 1.95	62.22 $\pm$ 2.47	70.45 $\pm$ 2.73	63.18 $\pm$ 2.46
	40%	66.90 $\pm$ 2.24	67.84 $\pm$ 2.88	62.05 $\pm$ 2.52	62.76 $\pm$ 2.53	56.91 $\pm$ 2.77	60.07 $\pm$ 3.21	50.62 $\pm$ 2.73
	45%	62.29 $\pm$ 2.29	63.16 $\pm$ 2.94	57.12 $\pm$ 2.54	58.06 $\pm$ 2.54	50.52 $\pm$ 2.76	52.86 $\pm$ 3.87	44.28 $\pm$ 2.62
	50%	57.76 $\pm$ 2.36	57.87 $\pm$ 2.98	51.78 $\pm$ 2.76	52.64 $\pm$ 2.61	44.28 $\pm$ 2.77	46.56 $\pm$ 3.77	38.45 $\pm$ 2.82
GIN	5%	80.95 $\pm$ 2.01	81.11 $\pm$ 0.88	80.45 $\pm$ 2.63	82.11 $\pm$ 2.60	80.35 $\pm$ 2.38	83.34 $\pm$ 1.55	80.77 $\pm$ 2.21
	10%	81.81 $\pm$ 2.46	81.74 $\pm$ 2.96	78.94 $\pm$ 1.74	79.86 $\pm$ 2.21	80.49 $\pm$ 2.32	80.64 $\pm$ 2.21	76.93 $\pm$ 2.55
	15%	80.48 $\pm$ 3.17	82.24 $\pm$ 2.21	78.94 $\pm$ 1.74	78.97 $\pm$ 2.68	78.35 $\pm$ 3.00	80.64 $\pm$ 2.21	76.95 $\pm$ 2.56
	20%	76.14 $\pm$ 3.79	81.77 $\pm$ 2.53	75.71 $\pm$ 4.33	76.91 $\pm$ 4.93	75.87 $\pm$ 3.46	75.86 $\pm$ 4.51	71.21 $\pm$ 3.29
	25%	79.02 $\pm$ 2.77	77.87 $\pm$ 5.65	74.90 $\pm$ 2.73	76.57 $\pm$ 2.59	73.66 $\pm$ 3.74	73.32 $\pm$ 4.28	64.84 $\pm$ 3.21
	30%	76.63 $\pm$ 4.38	77.86 $\pm$ 5.67	74.90 $\pm$ 2.73	76.57 $\pm$ 2.59	68.97 $\pm$ 6.19	73.32 $\pm$ 4.28	64.46 $\pm$ 3.97
	35%	75.32 $\pm$ 3.96	76.85 $\pm$ 7.28	74.70 $\pm$ 4.44	75.47 $\pm$ 4.78	64.09 $\pm$ 4.61	68.90 $\pm$ 3.99	58.04 $\pm$ 8.27
	40%	73.82 $\pm$ 2.89	77.07 $\pm$ 4.45	71.50 $\pm$ 5.96	69.71 $\pm$ 9.40	64.09 $\pm$ 4.41	59.54 $\pm$ 5.84	51.36 $\pm$ 3.94
	45%	71.02 $\pm$ 4.38	75.17 $\pm$ 2.36	66.79 $\pm$ 9.06	65.95 $\pm$ 11.8	48.40 $\pm$ 5.01	53.90 $\pm$ 4.37	42.55 $\pm$ 10.1
	50%	63.94 $\pm$ 10.7	74.26 $\pm$ 3.11	59.52 $\pm$ 10.9	64.11 $\pm$ 9.59	45.16 $\pm$ 5.17	45.77 $\pm$ 9.01	34.73 $\pm$ 10.6
GRAPHSage	5%	83.10 $\pm$ 1.19	83.38 $\pm$ 0.68	83.37 $\pm$ 1.18	83.41 $\pm$ 1.09	82.84 $\pm$ 1.31	83.56 $\pm$ 0.46	83.22 $\pm$ 1.13
	10%	80.39 $\pm$ 1.51	81.55 $\pm$ 0.97	79.97 $\pm$ 1.08	79.92 $\pm$ 1.01	79.54 $\pm$ 1.72	81.12 $\pm$ 1.15	79.70 $\pm$ 1.24
	15%	77.81 $\pm$ 1.74	81.54 $\pm$ 0.97	79.95 $\pm$ 1.08	79.89 $\pm$ 1.00	76.22 $\pm$ 2.20	81.09 $\pm$ 1.17	79.70 $\pm$ 1.25
	20%	74.34 $\pm$ 1.74	75.61 $\pm$ 1.71	73.41 $\pm$ 1.87	73.50 $\pm$ 1.71	72.25 $\pm$ 2.13	74.45 $\pm$ 1.84	71.64 $\pm$ 1.91
	25%	70.72 $\pm$ 1.85	72.39 $\pm$ 2.37	68.83 $\pm$ 1.91	69.02 $\pm$ 2.12	67.69 $\pm$ 2.50	69.64 $\pm$ 2.76	66.53 $\pm$ 1.93
	30%	67.71 $\pm$ 2.36	72.41 $\pm$ 2.39	68.89 $\pm$ 1.90	69.06 $\pm$ 2.17	63.08 $\pm$ 2.71	69.67 $\pm$ 2.79	66.54 $\pm$ 1.93
	35%	63.46 $\pm$ 1.99	67.89 $\pm$ 2.18	64.37 $\pm$ 1.93	64.76 $\pm$ 1.57	57.97 $\pm$ 2.99	64.52 $\pm$ 2.94	61.74 $\pm$ 2.46
	40%	59.70 $\pm$ 2.91	58.83 $\pm$ 2.77	55.69 $\pm$ 2.70	55.86 $\pm$ 2.80	52.71 $\pm$ 3.32	54.79 $\pm$ 2.91	51.43 $\pm$ 2.56
	45%	55.27 $\pm$ 2.50	53.93 $\pm$ 3.23	51.14 $\pm$ 2.74	51.35 $\pm$ 2.62	47.20 $\pm$ 3.15	49.40 $\pm$ 3.33	46.21 $\pm$ 2.12
	50%	49.93 $\pm$ 2.09	49.75 $\pm$ 3.12	46.37 $\pm$ 2.51	46.75 $\pm$ 2.68	41.97 $\pm$ 3.32	44.09 $\pm$ 3.29	41.15 $\pm$ 2.13
GAT	5%	79.50 $\pm$ 1.80	80.05 $\pm$ 1.02	80.39 $\pm$ 1.14	80.45 $\pm$ 1.20	79.35 $\pm$ 1.67	79.43 $\pm$ 1.51	79.45 $\pm$ 1.37
	10%	77.63 $\pm$ 2.14	77.89 $\pm$ 1.39	78.23 $\pm$ 1.32	77.89 $\pm$ 1.47	76.38 $\pm$ 1.95	77.39 $\pm$ 1.21	76.11 $\pm$ 2.22
	15%	75.26 $\pm$ 1.76	77.71 $\pm$ 1.37	77.87 $\pm$ 1.55	77.81 $\pm$ 1.66	73.47 $\pm$ 2.42	77.37 $\pm$ 1.19	76.57 $\pm$ 2.09
	20%	72.70 $\pm$ 2.76	73.07 $\pm$ 2.48	73.87 $\pm$ 1.80	73.58 $\pm$ 2.62	68.99 $\pm$ 3.07	70.27 $\pm$ 2.81	69.94 $\pm$ 2.52
	25%	70.33 $\pm$ 2.16	69.58 $\pm$ 2.69	70.77 $\pm$ 2.57	70.48 $\pm$ 1.44	65.87 $\pm$ 3.48	65.64 $\pm$ 2.34	64.80 $\pm$ 2.47
	30%	67.73 $\pm$ 2.38	69.91 $\pm$ 2.39	70.44 $\pm$ 2.82	70.01 $\pm$ 1.73	61.14 $\pm$ 2.79	65.79 $\pm$ 2.57	64.93 $\pm$ 2.63
	35%	64.98 $\pm$ 2.73	67.51 $\pm$ 2.90	68.04 $\pm$ 2.14	67.76 $\pm$ 2.31	55.89 $\pm$ 2.96	62.11 $\pm$ 3.75	60.69 $\pm$ 2.28
	40%	61.17 $\pm$ 2.76	61.25 $\pm$ 3.38	60.39 $\pm$ 3.33	60.51 $\pm$ 3.23	50.89 $\pm$ 3.38	52.90 $\pm$ 3.04	50.40 $\pm$ 2.70
	45%	57.46 $\pm$ 3.68	57.14 $\pm$ 3.53	55.49 $\pm$ 2.94	55.56 $\pm$ 3.14	44.76 $\pm$ 3.42	46.71 $\pm$ 3.98	43.82 $\pm$ 3.07
	50%	51.73 $\pm$ 2.34	51.24 $\pm$ 3.76	51.31 $\pm$ 3.41	51.88 $\pm$ 3.22	40.33 $\pm$ 3.41	40.99 $\pm$ 4.48	39.22 $\pm$ 2.83
TransformerConv	5%	84.42 $\pm$ 0.84	84.78 $\pm$ 0.29	84.70 $\pm$ 0.41	84.64 $\pm$ 0.67	84.06 $\pm$ 0.71	84.70 $\pm$ 0.14	84.96 $\pm$ 0.54
	10%	82.86 $\pm$ 1.11	83.84 $\pm$ 0.44	83.68 $\pm$ 0.79	83.32 $\pm$ 0.70	82.52 $\pm$ 1.04	83.94 $\pm$ 0.26	83.42 $\pm$ 0.99
	15%	81.30 $\pm$ 1.20	83.60 $\pm$ 0.32	83.28 $\pm$ 0.86	83.54 $\pm$ 0.77	80.10 $\pm$ 0.97	84.14 $\pm$ 0.34	83.50 $\pm$ 1.00
	20%	77.56 $\pm$ 0.69	79.66 $\pm$ 1.04	78.90 $\pm$ 0.81	78.94 $\pm$ 0.82	76.18 $\pm$ 0.79	77.36 $\pm$ 0.69	76.70 $\pm$ 2.15
	25%	75.30 $\pm$ 0.91	76.56 $\pm$ 0.70	77.18 $\pm$ 0.67	77.50 $\pm$ 0.87	72.12 $\pm$ 1.05	72.18 $\pm$ 1.08	72.88 $\pm$ 0.95
	30%	73.08 $\pm$ 1.92	76.66 $\pm$ 0.86	77.56 $\pm$ 0.56	77.58 $\pm$ 1.02	67.56 $\pm$ 1.87	71.96 $\pm$ 1.14	73.24 $\pm$ 1.28
	35%	69.66 $\pm$ 0.48	74.26 $\pm$ 1.18	74.00 $\pm$ 0.81	74.74 $\pm$ 0.51	61.80 $\pm$ 1.84	68.90 $\pm$ 1.51	69.20 $\pm$ 1.50
	40%	66.36 $\pm$ 1.57	66.36 $\pm$ 1.93	65.90 $\pm$ 0.78	65.74 $\pm$ 0.42	56.54 $\pm$ 1.84	57.40 $\pm$ 2.12	57.76 $\pm$ 1.69
	45%	61.16 $\pm$ 1.75	62.16 $\pm$ 1.86	61.32 $\pm$ 1.56	60.62 $\pm$ 2.15	50.08 $\pm$ 2.15	51.32 $\pm$ 0.92	51.28 $\pm$ 1.44
	50%	55.70 $\pm$ 2.32	55.88 $\pm$ 1.59	55.60 $\pm$ 1.59	55.78 $\pm$ 2.14	43.44 $\pm$ 2.76	44.28 $\pm$ 1.50	44.86 $\pm$ 1.65



Table 5: Comparison of noise model variants across GNN architecture for Amazon Photo dataset. Reported values are accuracy  $\pm$  std of 10 repetitions

GNN Architecture	Noise Level	SLN	Majority Vote +SLN	Veto Power +SLN	Sequential Flipping	CCN	Majority Vote +CCN	Veto Power +CCN
GCN	5%	86.78 $\pm$ 1.43	83.65 $\pm$ 6.28	85.05 $\pm$ 4.56	83.55 $\pm$ 6.18	86.66 $\pm$ 1.46	84.65 $\pm$ 5.59	85.35 $\pm$ 4.21
	10%	86.45 $\pm$ 1.16	82.29 $\pm$ 12.38	84.14 $\pm$ 3.82	83.54 $\pm$ 4.67	85.58 $\pm$ 1.32	84.38 $\pm$ 5.67	83.60 $\pm$ 3.27
	15%	85.49 $\pm$ 1.21	82.30 $\pm$ 12.38	84.16 $\pm$ 3.85	83.55 $\pm$ 4.67	83.53 $\pm$ 1.19	84.39 $\pm$ 5.69	83.58 $\pm$ 3.26
	20%	82.83 $\pm$ 3.66	82.86 $\pm$ 6.06	83.05 $\pm$ 3.65	80.82 $\pm$ 5.00	79.72 $\pm$ 4.84	77.60 $\pm$ 10.34	77.68 $\pm$ 6.76
	25%	83.96 $\pm$ 2.99	78.28 $\pm$ 9.38	81.87 $\pm$ 4.08	80.58 $\pm$ 7.92	77.00 $\pm$ 5.47	74.15 $\pm$ 9.42	70.81 $\pm$ 7.69
	30%	81.15 $\pm$ 9.72	78.26 $\pm$ 9.39	81.88 $\pm$ 4.03	80.66 $\pm$ 7.91	70.94 $\pm$ 12.13	74.16 $\pm$ 9.41	70.82 $\pm$ 7.69
	35%	83.01 $\pm$ 3.82	76.80 $\pm$ 11.90	77.65 $\pm$ 7.65	78.01 $\pm$ 9.09	62.77 $\pm$ 7.32	69.21 $\pm$ 9.21	63.43 $\pm$ 4.89
	40%	78.75 $\pm$ 4.02	76.00 $\pm$ 10.41	71.06 $\pm$ 12.34	70.89 $\pm$ 9.41	54.20 $\pm$ 7.31	56.45 $\pm$ 8.28	49.66 $\pm$ 3.14
	45%	73.45 $\pm$ 5.67	75.36 $\pm$ 8.82	66.92 $\pm$ 11.98	67.85 $\pm$ 11.36	44.15 $\pm$ 4.85	49.57 $\pm$ 7.92	40.74 $\pm$ 2.65
	50%	72.71 $\pm$ 4.76	71.59 $\pm$ 6.88	64.10 $\pm$ 8.61	66.44 $\pm$ 7.91	36.19 $\pm$ 4.19	42.51 $\pm$ 7.34	33.15 $\pm$ 3.93
GIN	5%	80.24 $\pm$ 4.32	81.32 $\pm$ 2.95	67.86 $\pm$ 17.91	64.96 $\pm$ 15.31	66.24 $\pm$ 17.36	78.02 $\pm$ 3.71	77.10 $\pm$ 5.15
	10%	67.88 $\pm$ 12.96	76.66 $\pm$ 7.74	56.66 $\pm$ 13.40	50.70 $\pm$ 20.65	69.98 $\pm$ 16.78	73.40 $\pm$ 9.67	63.00 $\pm$ 15.79
	15%	56.42 $\pm$ 19.08	76.76 $\pm$ 7.82	56.58 $\pm$ 12.77	52.92 $\pm$ 23.29	58.96 $\pm$ 13.60	73.42 $\pm$ 9.68	63.08 $\pm$ 15.79
	20%	50.32 $\pm$ 10.53	68.50 $\pm$ 9.65	43.04 $\pm$ 10.86	31.88 $\pm$ 8.94	58.22 $\pm$ 14.88	73.46 $\pm$ 6.61	48.64 $\pm$ 12.52
	25%	50.58 $\pm$ 19.81	67.24 $\pm$ 16.88	35.04 $\pm$ 2.90	33.62 $\pm$ 8.99	50.16 $\pm$ 10.96	69.38 $\pm$ 14.52	41.78 $\pm$ 10.62
	30%	59.58 $\pm$ 15.97	68.20 $\pm$ 17.34	35.30 $\pm$ 3.04	34.12 $\pm$ 9.61	57.52 $\pm$ 6.68	69.86 $\pm$ 14.56	42.00 $\pm$ 10.78
	35%	43.02 $\pm$ 9.76	53.28 $\pm$ 13.74	32.54 $\pm$ 3.71	30.80 $\pm$ 5.63	50.94 $\pm$ 19.75	54.24 $\pm$ 17.36	34.76 $\pm$ 10.25
	40%	38.20 $\pm$ 7.31	47.32 $\pm$ 10.51	23.80 $\pm$ 6.83	25.54 $\pm$ 5.70	41.90 $\pm$ 10.70	49.56 $\pm$ 7.88	30.10 $\pm$ 9.24
	45%	34.38 $\pm$ 7.71	40.28 $\pm$ 4.80	24.74 $\pm$ 4.46	27.04 $\pm$ 7.18	33.52 $\pm$ 17.39	48.84 $\pm$ 17.31	25.14 $\pm$ 3.94
	50%	31.00 $\pm$ 8.10	36.98 $\pm$ 8.71	21.14 $\pm$ 2.03	28.56 $\pm$ 1.88	33.00 $\pm$ 12.67	36.12 $\pm$ 17.27	21.78 $\pm$ 3.86
GRAPHSage	5%	90.56 $\pm$ 0.86	90.41 $\pm$ 0.61	90.29 $\pm$ 0.82	90.20 $\pm$ 0.64	90.39 $\pm$ 1.01	90.64 $\pm$ 0.50	90.29 $\pm$ 0.79
	10%	88.49 $\pm$ 0.84	89.26 $\pm$ 0.44	89.32 $\pm$ 0.78	89.35 $\pm$ 1.14	87.76 $\pm$ 1.17	89.26 $\pm$ 0.49	88.71 $\pm$ 0.88
	15%	85.86 $\pm$ 1.99	89.28 $\pm$ 0.43	89.32 $\pm$ 0.77	89.35 $\pm$ 1.15	84.68 $\pm$ 2.27	89.25 $\pm$ 0.48	88.70 $\pm$ 0.87
	20%	84.10 $\pm$ 1.48	85.14 $\pm$ 1.06	85.38 $\pm$ 1.30	85.42 $\pm$ 1.22	81.63 $\pm$ 2.54	83.38 $\pm$ 2.46	82.79 $\pm$ 2.36
	25%	81.73 $\pm$ 2.29	84.06 $\pm$ 1.34	82.15 $\pm$ 1.89	82.15 $\pm$ 2.09	77.96 $\pm$ 2.87	80.25 $\pm$ 2.78	77.73 $\pm$ 3.13
	30%	77.97 $\pm$ 2.17	84.06 $\pm$ 1.33	82.15 $\pm$ 1.88	82.16 $\pm$ 2.08	72.25 $\pm$ 2.84	80.04 $\pm$ 2.82	77.73 $\pm$ 3.13
	35%	75.72 $\pm$ 1.59	80.37 $\pm$ 2.55	78.16 $\pm$ 1.69	78.29 $\pm$ 2.20	65.55 $\pm$ 3.68	75.51 $\pm$ 3.75	70.94 $\pm$ 3.25
	40%	70.79 $\pm$ 2.14	73.37 $\pm$ 1.66	66.77 $\pm$ 3.97	68.63 $\pm$ 3.74	58.99 $\pm$ 2.38	63.46 $\pm$ 4.19	54.94 $\pm$ 4.07
	45%	65.88 $\pm$ 3.47	68.72 $\pm$ 2.34	61.36 $\pm$ 4.87	62.66 $\pm$ 4.42	50.78 $\pm$ 4.01	55.60 $\pm$ 4.85	47.78 $\pm$ 4.23
	50%	60.79 $\pm$ 3.71	64.32 $\pm$ 2.99	53.65 $\pm$ 5.30	56.09 $\pm$ 5.07	44.42 $\pm$ 4.67	47.71 $\pm$ 3.86	39.13 $\pm$ 4.36
GAT	5%	78.20 $\pm$ 1.79	79.07 $\pm$ 1.89	77.75 $\pm$ 1.95	77.29 $\pm$ 1.60	77.36 $\pm$ 2.45	78.79 $\pm$ 1.52	76.30 $\pm$ 1.64
	10%	73.70 $\pm$ 2.73	75.99 $\pm$ 1.53	74.40 $\pm$ 2.02	74.36 $\pm$ 1.77	73.07 $\pm$ 2.49	76.18 $\pm$ 2.21	73.34 $\pm$ 2.27
	15%	69.35 $\pm$ 2.71	75.97 $\pm$ 1.72	74.26 $\pm$ 1.98	74.30 $\pm$ 1.79	69.57 $\pm$ 2.85	76.06 $\pm$ 2.10	73.59 $\pm$ 2.80
	20%	66.41 $\pm$ 2.89	69.95 $\pm$ 1.86	66.82 $\pm$ 1.90	66.32 $\pm$ 1.99	65.73 $\pm$ 3.21	68.28 $\pm$ 2.92	65.38 $\pm$ 2.00
	25%	63.20 $\pm$ 3.03	66.08 $\pm$ 2.52	63.13 $\pm$ 2.32	62.52 $\pm$ 2.51	61.62 $\pm$ 3.64	63.45 $\pm$ 3.42	61.21 $\pm$ 1.97
	30%	59.29 $\pm$ 3.91	65.89 $\pm$ 2.65	63.02 $\pm$ 2.24	62.88 $\pm$ 2.70	56.64 $\pm$ 4.11	63.72 $\pm$ 3.37	61.14 $\pm$ 2.08
	35%	55.32 $\pm$ 3.37	61.61 $\pm$ 3.37	59.03 $\pm$ 2.54	58.43 $\pm$ 3.53	52.45 $\pm$ 3.48	58.66 $\pm$ 3.67	56.92 $\pm$ 2.47
	40%	51.17 $\pm$ 4.30	53.19 $\pm$ 2.79	50.46 $\pm$ 2.77	50.45 $\pm$ 3.31	48.67 $\pm$ 4.03	50.72 $\pm$ 3.03	47.93 $\pm$ 2.76
	45%	47.79 $\pm$ 3.67	48.55 $\pm$ 3.52	46.59 $\pm$ 3.19	46.70 $\pm$ 3.37	45.01 $\pm$ 2.82	47.40 $\pm$ 4.53	42.69 $\pm$ 3.05
	50%	44.12 $\pm$ 4.35	45.68 $\pm$ 2.85	41.16 $\pm$ 3.31	40.56 $\pm$ 3.59	39.93 $\pm$ 2.99	43.33 $\pm$ 3.73	38.03 $\pm$ 3.27
TransformerConv	5%	85.57 $\pm$ 0.83	80.87 $\pm$ 8.55	84.13 $\pm$ 1.88	84.25 $\pm$ 1.36	85.48 $\pm$ 0.95	85.80 $\pm$ 0.72	84.32 $\pm$ 1.22
	10%	83.17 $\pm$ 1.89	83.60 $\pm$ 1.08	81.84 $\pm$ 1.88	82.17 $\pm$ 2.25	82.45 $\pm$ 1.06	83.58 $\pm$ 1.47	81.83 $\pm$ 2.44
	15%	79.73 $\pm$ 1.42	83.58 $\pm$ 1.03	82.15 $\pm$ 1.43	81.91 $\pm$ 2.07	78.93 $\pm$ 1.54	83.65 $\pm$ 1.40	81.94 $\pm$ 2.45
	20%	77.52 $\pm$ 2.20	78.81 $\pm$ 1.16	73.40 $\pm$ 5.65	76.66 $\pm$ 2.37	74.06 $\pm$ 3.01	76.04 $\pm$ 2.76	75.76 $\pm$ 2.32
	25%	74.34 $\pm$ 3.35	76.04 $\pm$ 2.34	71.73 $\pm$ 2.25	72.54 $\pm$ 3.45	71.27 $\pm$ 4.41	73.05 $\pm$ 2.94	72.28 $\pm$ 1.72
	30%	69.06 $\pm$ 2.85	76.65 $\pm$ 2.27	72.27 $\pm$ 1.56	74.51 $\pm$ 2.07	67.01 $\pm$ 4.39	73.39 $\pm$ 2.96	72.35 $\pm$ 1.29
	35%	64.24 $\pm$ 2.99	72.60 $\pm$ 2.20	69.80 $\pm$ 2.56	68.63 $\pm$ 2.74	62.16 $\pm$ 2.99	69.08 $\pm$ 4.08	68.73 $\pm$ 2.45
	40%	62.37 $\pm$ 0.45	62.00 $\pm$ 3.18	63.27 $\pm$ 2.03	62.32 $\pm$ 2.40	58.16 $\pm$ 3.18	55.05 $\pm$ 6.65	60.63 $\pm$ 2.46
	45%	58.77 $\pm$ 2.13	58.33 $\pm$ 4.13	57.54 $\pm$ 2.01	57.76 $\pm$ 1.11	54.38 $\pm$ 2.85	49.03 $\pm$ 6.71	54.25 $\pm$ 3.26
	50%	52.70 $\pm$ 1.47	51.94 $\pm$ 4.08	52.50 $\pm$ 2.53	50.93 $\pm$ 6.66	45.96 $\pm$ 2.73	44.23 $\pm$ 5.22	48.08 $\pm$ 2.30

### **E.3 Comparison of Noise Model Variants across Noise-Robust Algorithms**

Detailed results related to how existing noise robust algorithms behave in the presence of EDN, SLN and CCN is included in Table 6,7, and 8.

Table 6: Comparison of noise model variants across noise robust algorithms for graphs for Citeseer dataset. Reported values are accuracy  $\pm$  std of 10 repetitions

Noise-Robust method	Noise Level	SLN	MV+SLN	Veto+SLN	Sequential	CCN	MV+CCN	Veto+CCN
GCN	5%	73.92 ± 1.07	72.64 ± 0.47	72.27 ± 0.70	72.34 ± 0.58	73.99 ± 0.99	72.91 ± 0.60	72.24 ± 0.63
	10%	72.23 ± 1.35	71.47 ± 0.97	70.39 ± 0.84	70.19 ± 0.92	72.18 ± 1.18	71.35 ± 1.00	69.99 ± 0.90
	15%	70.17 ± 1.47	71.50 ± 0.99	70.42 ± 0.81	70.23 ± 0.90	70.04 ± 1.51	71.36 ± 1.00	69.98 ± 0.87
	20%	68.09 ± 1.59	67.59 ± 1.39	65.07 ± 1.12	65.02 ± 1.32	67.15 ± 1.74	66.84 ± 1.45	63.04 ± 1.60
	25%	65.55 ± 1.74	65.34 ± 1.20	61.64 ± 1.43	61.79 ± 1.42	64.29 ± 1.91	63.93 ± 1.22	58.42 ± 1.76
	30%	62.49 ± 2.06	65.34 ± 1.17	61.63 ± 1.47	61.81 ± 1.41	60.43 ± 2.21	63.90 ± 1.23	58.41 ± 1.76
	35%	59.34 ± 2.76	62.38 ± 1.46	57.69 ± 1.72	58.03 ± 1.50	56.44 ± 2.60	60.74 ± 1.73	53.31 ± 2.30
	40%	56.17 ± 2.28	55.76 ± 1.70	48.50 ± 2.58	49.65 ± 2.46	51.85 ± 2.21	52.48 ± 1.66	42.91 ± 2.22
DGNN	45%	52.47 ± 2.39	52.33 ± 1.55	43.86 ± 2.21	45.57 ± 2.21	47.30 ± 2.34	47.36 ± 1.25	37.93 ± 2.02
	50%	48.81 ± 2.58	48.33 ± 1.63	38.71 ± 1.81	41.39 ± 2.54	41.89 ± 2.28	41.93 ± 1.80	33.23 ± 2.08
	5%	66.46 ± 2.84	65.15 ± 2.37	62.17 ± 2.41	60.28 ± 3.58	64.04 ± 2.22	66.06 ± 1.90	61.92 ± 8.79
	10%	62.08 ± 2.91	61.30 ± 4.17	55.61 ± 5.64	58.73 ± 4.48	60.92 ± 4.72	63.10 ± 1.94	55.62 ± 8.30
	15%	59.88 ± 2.93	61.19 ± 2.74	57.88 ± 5.52	57.58 ± 4.74	56.64 ± 7.73	62.80 ± 2.37	58.64 ± 5.10
	20%	56.10 ± 3.77	57.35 ± 4.33	43.57 ± 8.98	49.19 ± 5.13	52.83 ± 4.43	56.86 ± 4.57	51.18 ± 4.22
	25%	53.07 ± 4.92	51.18 ± 10.06	45.02 ± 6.99	44.70 ± 6.52	49.78 ± 5.92	53.62 ± 6.91	46.24 ± 6.04
	30%	46.85 ± 8.87	56.83 ± 2.33	42.69 ± 7.29	43.90 ± 8.80	49.27 ± 8.32	56.55 ± 3.89	41.69 ± 8.40
PIGNN	35%	45.47 ± 6.33	49.32 ± 7.73	39.64 ± 8.64	40.65 ± 5.40	40.58 ± 8.96	53.42 ± 4.70	41.64 ± 7.89
	40%	38.74 ± 8.89	44.01 ± 7.75	31.46 ± 6.04	32.28 ± 8.11	36.76 ± 7.34	44.09 ± 8.14	37.44 ± 7.27
	45%	41.89 ± 6.73	43.71 ± 4.72	29.48 ± 6.39	27.27 ± 9.29	32.62 ± 6.84	44.71 ± 5.86	32.83 ± 4.41
	50%	33.25 ± 8.00	39.23 ± 6.73	25.96 ± 5.42	27.17 ± 5.13	29.62 ± 7.02	38.66 ± 6.20	31.26 ± 4.34
	5%	76.58 ± 2.04	72.83 ± 3.60	71.34 ± 5.36	71.61 ± 5.36	74.02 ± 2.20	73.60 ± 1.74	71.63 ± 5.38
	10%	73.19 ± 5.30	72.03 ± 2.89	71.88 ± 5.81	70.48 ± 6.23	72.95 ± 2.72	73.01 ± 2.05	71.47 ± 3.29
	15%	72.26 ± 5.23	72.03 ± 2.89	71.88 ± 5.81	70.48 ± 6.23	71.10 ± 4.76	72.98 ± 2.10	71.47 ± 3.29
	20%	70.80 ± 4.83	68.48 ± 5.68	68.15 ± 4.52	66.71 ± 7.75	68.83 ± 4.37	69.45 ± 3.38	66.47 ± 5.45
RNCGLN	25%	71.61 ± 3.67	69.62 ± 3.46	66.79 ± 6.75	66.11 ± 8.15	66.19 ± 5.57	68.11 ± 4.49	62.79 ± 4.89
	30%	71.02 ± 4.71	69.62 ± 3.46	66.79 ± 6.75	66.11 ± 8.15	62.67 ± 5.16	68.10 ± 4.51	62.79 ± 4.89
	35%	66.62 ± 5.84	64.72 ± 7.16	64.76 ± 8.13	67.66 ± 5.28	57.74 ± 7.03	64.68 ± 4.45	55.45 ± 7.81
	40%	67.42 ± 4.07	61.92 ± 8.26	57.63 ± 8.84	58.49 ± 10.92	51.33 ± 6.57	56.83 ± 5.93	44.39 ± 6.45
	45%	60.79 ± 11.05	56.18 ± 9.03	56.32 ± 3.70	58.49 ± 7.80	44.47 ± 7.21	49.97 ± 7.33	38.14 ± 4.95
	50%	60.54 ± 7.37	57.45 ± 7.71	50.13 ± 7.12	52.20 ± 9.57	40.65 ± 5.59	39.72 ± 5.44	33.82 ± 5.40
	5%	72.15 ± 3.13	69.00 ± 3.88	68.33 ± 1.98	67.54 ± 1.51	69.86 ± 3.23	68.05 ± 2.46	68.87 ± 2.75
	10%	69.37 ± 2.64	67.06 ± 3.44	66.86 ± 3.28	67.05 ± 2.75	68.25 ± 3.19	66.03 ± 1.75	67.41 ± 3.08
RTGNN	15%	67.73 ± 3.53	67.06 ± 3.44	66.86 ± 3.28	67.05 ± 2.75	66.06 ± 2.11	66.03 ± 1.75	67.41 ± 3.08
	20%	66.08 ± 3.83	65.52 ± 4.33	64.77 ± 4.65	64.59 ± 4.42	62.36 ± 3.81	63.95 ± 3.71	62.77 ± 3.67
	25%	65.09 ± 4.12	62.51 ± 2.37	64.76 ± 4.86	62.41 ± 4.41	58.22 ± 2.80	61.01 ± 2.82	56.50 ± 2.01
	30%	63.75 ± 4.67	62.51 ± 2.37	64.76 ± 4.86	62.41 ± 4.41	55.84 ± 3.24	61.01 ± 2.82	56.50 ± 2.01
	35%	58.27 ± 4.05	61.52 ± 3.32	59.26 ± 5.01	60.25 ± 4.37	53.61 ± 2.80	58.91 ± 2.37	51.61 ± 2.90
	40%	57.78 ± 4.86	54.80 ± 2.29	50.66 ± 5.56	50.33 ± 3.87	47.61 ± 3.65	51.35 ± 2.41	41.07 ± 2.31
	45%	51.68 ± 5.01	51.01 ± 3.35	44.24 ± 4.52	45.94 ± 4.38	41.87 ± 2.96	46.81 ± 3.73	37.95 ± 3.20
	50%	47.35 ± 2.63	48.06 ± 3.17	42.58 ± 4.59	42.43 ± 4.39	37.87 ± 2.92	40.29 ± 3.17	32.19 ± 3.05
NRGNN	5%	73.98 ± 4.38	74.31 ± 1.04	74.26 ± 1.53	73.95 ± 1.35	74.18 ± 0.80	74.07 ± 1.15	74.12 ± 0.97
	10%	73.39 ± 1.50	73.57 ± 1.55	74.67 ± 0.55	74.22 ± 0.90	72.50 ± 2.82	73.67 ± 1.25	73.39 ± 1.27
	15%	72.92 ± 1.32	73.88 ± 1.69	74.75 ± 0.97	74.25 ± 0.86	71.71 ± 2.08	73.77 ± 1.20	73.86 ± 1.13
	20%	71.28 ± 2.51	73.74 ± 1.61	73.81 ± 1.17	73.66 ± 1.69	69.66 ± 2.11	72.21 ± 2.05	69.41 ± 2.21
	25%	72.47 ± 1.78	72.81 ± 1.55	72.82 ± 1.97	71.95 ± 3.23	65.87 ± 2.81	71.07 ± 2.65	66.09 ± 2.46
	30%	71.77 ± 1.99	73.09 ± 1.69	72.73 ± 2.21	72.00 ± 3.37	62.01 ± 2.56	70.67 ± 2.37	67.34 ± 2.81
	35%	71.14 ± 2.49	72.77 ± 1.38	72.53 ± 1.59	72.07 ± 1.54	58.38 ± 3.08	68.53 ± 3.11	63.19 ± 1.92
	40%	72.50 ± 1.45	73.10 ± 1.29	69.53 ± 3.85	71.21 ± 2.24	53.08 ± 2.38	59.80 ± 4.92	51.65 ± 2.83
CRGNN	45%	70.25 ± 1.97	71.09 ± 2.30	64.59 ± 5.95	69.16 ± 2.81	42.61 ± 4.55	53.90 ± 3.99	45.36 ± 3.73
	50%	67.93 ± 3.38	68.45 ± 3.17	61.55 ± 5.86	65.08 ± 4.54	36.68 ± 4.00	44.48 ± 3.88	37.79 ± 5.15
	5%	75.76 ± 0.99	74.19 ± 1.47	74.22 ± 1.19	74.14 ± 1.15	71.69 ± 3.75	73.56 ± 2.35	74.53 ± 1.63
	10%	73.12 ± 2.92	73.30 ± 1.69	73.71 ± 2.23	72.94 ± 3.14	70.34 ± 4.61	73.72 ± 1.86	73.62 ± 2.95
	15%	72.88 ± 2.25	73.30 ± 1.69	73.71 ± 2.23	72.94 ± 3.14	69.84 ± 3.25	73.72 ± 1.86	73.62 ± 2.95
	20%	71.97 ± 3.18	73.73 ± 1.77	70.95 ± 3.54	71.44 ± 2.62	69.74 ± 3.94	72.42 ± 2.80	69.37 ± 5.16
	25%	73.78 ± 1.02	72.68 ± 2.15	70.86 ± 4.00	70.40 ± 4.18	67.06 ± 2.90	72.08 ± 2.89	66.07 ± 6.16
	30%	72.02 ± 2.94	72.68 ± 2.15	70.86 ± 4.00	70.40 ± 4.18	64.49 ± 5.70	72.08 ± 2.89	66.07 ± 6.16
DeGLIF	35%	70.75 ± 3.18	72.57 ± 2.98	71.54 ± 2.60	71.35 ± 3.99	58.90 ± 5.68	71.68 ± 2.69	61.20 ± 3.92
	40%	68.24 ± 10.15	70.00 ± 5.80	67.28 ± 5.79	68.48 ± 5.03	57.15 ± 5.37	64.95 ± 6.39	48.13 ± 4.68
	45%	70.80 ± 2.43	70.73 ± 5.18	65.17 ± 6.89	64.09 ± 8.24	46.98 ± 3.99	55.79 ± 5.34	40.30 ± 5.00
	50%	68.73 ± 6.74	70.84 ± 3.20	65.90 ± 6.15	67.39 ± 4.83	40.58 ± 6.03	43.34 ± 6.42	32.92 ± 5.02
	5%	76.34 ± 2.41	74.74 ± 1.86	74.64 ± 1.79	74.24 ± 2.41	75.09 ± 1.07	74.78 ± 2.31	74.30 ± 1.48
	10%	74.75 ± 1.85	73.73 ± 2.19	73.90 ± 2.22	74.16 ± 1.71	72.93 ± 1.98	73.47 ± 2.12	72.53 ± 2.97
	15%	72.65 ± 3.76	74.18 ± 0.99	73.87 ± 2.05	74.04 ± 1.84	68.46 ± 4.22	73.28 ± 2.26	72.27 ± 3.01
	20%	73.16 ± 3.11	72.61 ± 3.61	71.57 ± 2.74	71.29 ± 3.06	67.57 ± 4.26	72.31 ± 2.21	65.18 ± 3.82
CGNN	25%	73.22 ± 1.63	70.35 ± 6.12	71.21 ± 3.16	72.50 ± 1.97	65.98 ± 4.25	70.15 ± 1.75	58.29 ± 9.09
	30%	66.57 ± 8.42	72.85 ± 1.59	71.32 ± 3.09	72.48 ± 1.96	58.30 ± 3.59	69.26 ± 3.68	58.08 ± 9.21
	35%	70.30 ± 2.01	71.13 ± 4.37	69.48 ± 3.92	69.83 ± 3.81	55.05 ± 4.78	67.03 ± 2.64	52.26 ± 8.92
	40%	67.04 ± 8.01	70.09 ± 1.42	59.55 ± 9.25	62.90 ± 11.23	51.98 ± 2.71	54.97 ± 8.59	44.16 ± 7.27
	45%	64.84 ± 4.24	64.16 ± 8.81	57.43 ± 7.86	63.37 ± 5.93	45.19 ± 3.63	52.46 ± 3.34	40.44 ± 3.00
	50%	58.61 ± 10.66	60.17 ± 9.69	48.89 ± 9.34	56.31 ± 9.96	39.24 ± 2.95	44.35 ± 7.17	31.72 ± 4.61
	5%	77.80 ± 0.83	74.20 ± 1.74	73.69 ± 1.85	73.11 ± 3.40	72.67 ± 4.49	73.51 ± 2.24	74.21 ± 1.59
	10%	68.26 ± 0.71	72.25 ± 4.08	73.21 ± 2.53	71.24 ± 4.68	70.31 ± 5.93	73.15 ± 2.19	72.30 ± 2.85
DeGLIF	15%	69.00 ± 6.46	72.24 ± 4.10	73.21 ± 2.53	71.24 ± 4.68	70.54 ± 4.92	73.15 ± 2.19	72.67 ± 2.14
	20%	67.20 ± 9.02	72.26 ± 1.97	70.18 ± 3.51	69.19 ± 2.38	65.47 ± 8.13	71.48 ± 1.92	64.10 ± 4.91
	25%	69.86 ± 4.46	70.54 ± 3.82	69.04 ± 5.15	70.09 ± 4.03	61.63 ± 9.43	67.52 ± 6.32	60.02 ± 7.17
	30%	68.08 ± 5.78	70.52 ± 3.80	69.04 ± 5.15	70.11 ± 4.02	60.42 ± 8.46	67.50 ± 6.31	60.02 ± 7.17
	35%	64.80 ± 8.75	67.83 ± 5.76	63.80 ± 7.97	62.36 ± 8.36	51.63 ± 7.13	66.05 ± 5.01	54.83 ± 3.89
	40%	60.94 ± 10.82	60.79 ± 7.18	53.98 ± 10.53	54.99 ± 8.00	50.20 ± 8.70	56.50 ± 5.54	46.61 ± 3.00
	45%	58.62 ± 8.03	55.96 ± 11.66	50.57 ± 11.89	50.62 ± 10.95	44.70 ± 6.39	50.49 ± 6.26	41.45 ± 3.50
	50%	50.79 ± 7.10	53.76 ± 10.94	44.16 ± 8.14	46.03 ± 7.97	41.16 ± 3.85	43.77 ± 4.04	35.67 ± 4.35
DeGLIF	5%	77.58 ± 1.10	77.36 ± 1.24	77.64 ± 1.71	77.50 ± 1.80	77.92 ± 1.24	77.34 ± 1.41	77.64 ± 1.42
	10%	76.92 ± 1.46	76.88 ± 1.31	78.04 ± 1.57	77.54 ± 1.80	77.34 ± 1.10	77.24 ± 1.88	77.06 ± 1.83
	15%	77.80 ± 1.72	76.86 ± 1.32	77.80 ± 1.74	77.58 ± 1.78	77.54 ± 1.72	77.18 ± 1.90	77.02 ± 1.82
	20%	77.02 ± 1.64	76.30 ± 1.06	76.52 ± 1.59	76.78 ± 2.21	77.78 ± 1.58	77.70 ± 2.21	75.30 ± 1.70
	25%	76.10 ± 1.21	76.24 ± 1.48	75.86 ± 2.28	76.04 ± 1.96	74.86 ± 2.20	75.94 ± 2.44	73.40 ± 2.72
	30%	75.04 ± 1.61	76.22 ± 1.49	75.80 ± 2.17	76.18 ± 1.92	73.54 ± 2.07	75.98 ± 2.45	73.38 ± 1.75
	35%	74.06 ± 1.45	75.66 ± 0.82	75.12 ± 1.77	75.40 ± 2.05	70.54 ± 2.22	73.82 ± 2.06	69.62 ± 3.61
	40%	73.18 ± 1.69	74.52 ± 1.61	72.80 ± 1.67	73.06 ± 2.76	67.12 ± 2.05	68.54 ± 4.28	56.60 ± 3.14
DeGLIF	45%	70.58 ± 1.44	72.38 ± 2.06	71.18 ± 2.99	71.98 ± 2.90	59.48 ± 3.76	62.02 ± 3.25	47 ± 5.34
	50%	67.38 ± 0.88	70.44 ± 2.13	68.34 ± 1.96	69.36 ± 1.85	51.71.		

Table 7: Comparison of noise model variants across noise robust algorithms for graphs for Cora dataset. Reported values are accuracy  $\pm$  std of 10 repetitions

Noise-Robust method	Noise Level	SLN	MV+SLN	Veto+SLN	Sequential	CCN	MV+CCN	Veto+CCN
GCN	5%	84.73 ± 0.94	85.00 ± 0.44	85.19 ± 0.74	85.09 ± 0.73	84.27 ± 0.98	85.36 ± 0.48	85.36 ± 0.50
	10%	83.03 ± 1.14	83.90 ± 0.69	83.46 ± 0.69	83.44 ± 0.80	82.08 ± 1.53	83.60 ± 1.00	82.41 ± 1.09
	15%	81.08 ± 1.48	83.92 ± 0.71	83.51 ± 0.63	83.47 ± 0.76	79.21 ± 1.82	83.62 ± 1.00	82.40 ± 1.07
	20%	79.06 ± 1.46	80.38 ± 1.32	78.37 ± 1.58	78.49 ± 1.47	75.76 ± 1.75	78.38 ± 2.04	74.45 ± 1.68
	25%	76.46 ± 1.48	77.46 ± 1.99	74.49 ± 2.09	74.65 ± 2.03	71.97 ± 1.77	74.84 ± 2.58	68.85 ± 2.30
	30%	73.68 ± 1.50	77.51 ± 1.99	74.50 ± 2.01	74.64 ± 2.04	67.67 ± 1.98	74.90 ± 2.57	68.81 ± 2.29
	35%	70.41 ± 1.76	74.79 ± 2.24	71.08 ± 1.97	71.36 ± 1.95	62.22 ± 2.47	70.45 ± 2.73	63.18 ± 2.46
	40%	66.90 ± 2.24	67.84 ± 2.88	62.05 ± 2.52	62.76 ± 2.53	56.91 ± 2.77	60.07 ± 3.21	50.62 ± 2.73
	45%	62.29 ± 2.29	63.16 ± 2.94	57.12 ± 2.54	58.06 ± 2.54	50.52 ± 2.76	52.86 ± 3.87	44.28 ± 2.62
	50%	57.76 ± 2.36	57.87 ± 2.98	51.78 ± 2.76	52.64 ± 2.61	44.28 ± 2.77	46.56 ± 3.77	38.45 ± 2.82
DGNN	5%	80.84 ± 2.63	82.76 ± 2.10	81.58 ± 1.14	81.10 ± 1.96	82.92 ± 1.55	82.90 ± 2.74	78.26 ± 6.84
	10%	78.98 ± 3.19	80.80 ± 0.67	71.08 ± 17.39	78.80 ± 1.67	79.38 ± 2.84	81.02 ± 2.03	77.00 ± 4.09
	15%	80.86 ± 1.18	79.22 ± 5.06	74.66 ± 13.61	80.02 ± 1.02	75.38 ± 1.63	79.98 ± 2.40	73.08 ± 6.84
	20%	67.86 ± 11.85	78.24 ± 4.15	70.50 ± 4.50	69.70 ± 9.97	74.26 ± 3.23	69.48 ± 10.10	69.54 ± 3.36
	25%	77.34 ± 0.78	70.82 ± 13.51	65.52 ± 6.04	69.60 ± 6.07	65.26 ± 8.88	66.30 ± 4.78	57.68 ± 14.97
	30%	73.18 ± 5.15	74.82 ± 3.93	69.88 ± 3.18	68.62 ± 5.73	65.50 ± 6.27	70.58 ± 3.55	63.88 ± 6.37
	35%	64.28 ± 11.29	75.16 ± 7.75	59.04 ± 29.25	65.10 ± 5.57	58.88 ± 7.01	65.00 ± 11.18	62.72 ± 3.62
	40%	61.94 ± 16.50	66.68 ± 7.27	52.78 ± 15.79	57.44 ± 11.76	56.04 ± 5.50	57.40 ± 8.35	39.00 ± 8.34
	45%	64.98 ± 7.65	61.82 ± 10.12	51.20 ± 11.56	53.06 ± 14.23	49.08 ± 13.28	50.80 ± 6.57	42.30 ± 4.69
	50%	60.04 ± 7.61	59.00 ± 11.16	50.84 ± 8.18	47.74 ± 6.94	44.52 ± 7.22	43.66 ± 4.04	37.78 ± 7.85
PIGNN	5%	81.94 ± 1.53	83.52 ± 2.55	84.62 ± 1.44	84.58 ± 1.56	83.92 ± 1.23	84.34 ± 0.75	83.66 ± 1.63
	10%	83.32 ± 1.96	82.94 ± 1.49	82.70 ± 3.20	82.72 ± 3.06	82.14 ± 1.84	82.64 ± 0.93	81.82 ± 3.09
	15%	84.02 ± 1.01	82.94 ± 1.49	82.70 ± 3.20	82.72 ± 3.06	83.08 ± 2.64	82.64 ± 0.93	81.82 ± 3.09
	20%	81.18 ± 5.51	79.10 ± 7.54	83.16 ± 3.46	81.46 ± 3.83	78.76 ± 2.65	77.44 ± 6.32	77.70 ± 6.58
	25%	81.92 ± 2.11	79.12 ± 3.33	84.22 ± 1.44	81.56 ± 4.06	76.84 ± 1.32	75.98 ± 3.66	71.96 ± 5.04
	30%	78.82 ± 4.15	79.12 ± 3.33	84.22 ± 1.44	81.56 ± 4.06	72.80 ± 3.62	75.98 ± 3.66	71.96 ± 5.04
	35%	82.22 ± 1.18	80.84 ± 3.57	82.20 ± 4.37	80.26 ± 6.11	71.00 ± 3.46	70.34 ± 8.29	65.88 ± 6.31
	40%	78.04 ± 2.17	74.64 ± 9.50	77.56 ± 4.46	73.12 ± 8.67	54.18 ± 9.67	62.46 ± 2.67	58.08 ± 3.55
	45%	71.14 ± 12.25	79.00 ± 2.55	70.96 ± 10.75	71.38 ± 8.92	58.28 ± 5.52	52.18 ± 4.12	46.76 ± 4.65
	50%	75.86 ± 8.08	72.16 ± 6.49	62.36 ± 17.41	68.80 ± 9.64	40.68 ± 6.56	42.92 ± 2.46	38.12 ± 5.51
RNCGLN	5%	83.04 ± 0.17	80.64 ± 0.61	79.78 ± 0.64	79.72 ± 0.50	79.38 ± 1.83	79.88 ± 0.70	79.00 ± 0.75
	10%	79.84 ± 0.76	79.66 ± 2.04	79.70 ± 0.88	78.86 ± 0.98	78.60 ± 1.26	79.34 ± 1.59	79.16 ± 1.34
	15%	78.14 ± 1.11	79.66 ± 2.04	79.70 ± 0.88	78.86 ± 0.98	75.84 ± 2.27	79.34 ± 1.59	79.16 ± 1.34
	20%	76.72 ± 0.82	76.10 ± 3.38	75.14 ± 1.78	75.10 ± 1.29	71.10 ± 1.98	73.86 ± 3.68	72.78 ± 3.19
	25%	73.60 ± 2.72	71.82 ± 2.92	71.32 ± 2.72	71.90 ± 1.76	65.66 ± 2.61	69.46 ± 3.78	66.94 ± 1.96
	30%	70.38 ± 3.35	71.82 ± 2.92	71.32 ± 2.72	71.90 ± 1.76	63.04 ± 3.45	69.46 ± 3.78	66.94 ± 1.96
	35%	67.00 ± 4.56	68.98 ± 5.36	66.04 ± 3.08	66.34 ± 3.19	56.24 ± 3.64	64.68 ± 4.88	62.18 ± 1.54
	40%	62.62 ± 3.72	60.86 ± 1.77	59.18 ± 4.60	57.62 ± 2.92	51.46 ± 5.06	55.62 ± 4.28	52.92 ± 3.38
	45%	54.24 ± 2.31	55.24 ± 1.66	55.98 ± 5.93	53.34 ± 2.73	45.66 ± 5.71	48.06 ± 3.53	45.66 ± 2.90
	50%	51.70 ± 2.89	48.80 ± 3.41	47.36 ± 4.00	45.02 ± 4.34	39.98 ± 2.54	42.14 ± 2.59	41.48 ± 4.12
RTGNN	5%	75.85 ± 1.62	72.32 ± 2.97	73.72 ± 2.17	73.41 ± 2.99	73.04 ± 1.97	72.79 ± 3.02	71.97 ± 3.66
	10%	72.26 ± 1.93	72.19 ± 3.44	73.16 ± 2.89	73.16 ± 2.28	71.00 ± 4.11	71.62 ± 2.83	72.76 ± 3.14
	15%	72.43 ± 4.28	72.45 ± 2.97	73.67 ± 2.62	73.13 ± 2.34	75.17 ± 3.16	71.63 ± 2.84	72.76 ± 3.14
	20%	72.30 ± 2.63	72.59 ± 3.93	71.67 ± 2.14	73.38 ± 3.28	71.72 ± 3.26	64.00 ± 7.76	68.27 ± 4.76
	25%	71.75 ± 5.44	71.00 ± 2.82	75.67 ± 1.90	76.01 ± 2.41	68.12 ± 3.87	59.35 ± 5.43	62.70 ± 7.54
	30%	70.68 ± 6.11	70.96 ± 2.77	75.62 ± 1.85	75.44 ± 2.00	64.25 ± 3.17	59.35 ± 5.43	62.70 ± 7.54
	35%	72.43 ± 5.86	72.64 ± 3.43	72.66 ± 3.52	74.43 ± 4.99	58.24 ± 5.09	52.69 ± 12.46	58.65 ± 11.24
	40%	68.15 ± 5.36	71.61 ± 4.57	68.21 ± 8.10	71.86 ± 6.27	56.07 ± 4.16	44.69 ± 7.73	55.83 ± 8.25
	45%	66.49 ± 9.18	66.55 ± 4.69	68.06 ± 10.07	69.47 ± 6.84	51.88 ± 6.52	42.16 ± 5.74	48.81 ± 10.04
	50%	60.02 ± 13.63	60.36 ± 9.39	63.87 ± 8.59	62.91 ± 6.22	39.20 ± 6.07	39.41 ± 5.13	40.31 ± 5.92
NRGNN	5%	76.49 ± 2.74	76.02 ± 1.97	76.59 ± 1.93	77.08 ± 1.40	73.42 ± 2.71	76.08 ± 2.09	73.70 ± 3.76
	10%	76.90 ± 2.00	76.66 ± 2.54	75.80 ± 4.12	77.18 ± 3.81	76.88 ± 2.11	74.18 ± 1.36	76.02 ± 4.32
	15%	76.45 ± 1.80	76.66 ± 2.54	75.83 ± 4.14	77.18 ± 3.81	76.04 ± 2.57	74.18 ± 1.36	76.02 ± 4.32
	20%	74.99 ± 2.53	75.14 ± 2.77	75.33 ± 3.22	76.09 ± 1.68	76.50 ± 3.83	71.02 ± 3.74	69.34 ± 5.50
	25%	75.10 ± 2.21	74.20 ± 3.81	76.06 ± 3.61	76.18 ± 1.61	68.32 ± 4.36	69.62 ± 5.29	69.66 ± 3.70
	30%	75.03 ± 3.46	74.20 ± 3.81	76.06 ± 3.61	76.18 ± 1.61	61.08 ± 10.16	69.62 ± 5.29	69.66 ± 3.70
	35%	72.63 ± 5.88	73.48 ± 2.30	75.35 ± 1.99	74.79 ± 2.81	55.06 ± 6.70	63.02 ± 8.10	65.66 ± 8.87
	40%	72.58 ± 4.07	73.69 ± 5.32	73.62 ± 4.66	74.61 ± 3.59	56.64 ± 2.84	59.58 ± 7.85	59.52 ± 10.36
	45%	70.75 ± 5.94	72.17 ± 5.09	74.12 ± 5.32	72.32 ± 3.59	44.80 ± 3.12	46.54 ± 11.32	48.60 ± 9.05
	50%	66.81 ± 9.02	74.82 ± 2.95	70.19 ± 8.26	70.25 ± 8.08	34.98 ± 3.72	41.58 ± 11.29	43.86 ± 5.51
CRGNN	5%	84.50 ± 2.57	84.10 ± 1.31	85.14 ± 1.96	84.76 ± 1.65	84.62 ± 2.51	83.86 ± 2.06	82.98 ± 2.42
	10%	84.63 ± 1.67	84.54 ± 2.05	83.08 ± 1.60	83.34 ± 2.30	80.62 ± 2.61	83.16 ± 1.54	82.24 ± 2.18
	15%	82.76 ± 1.71	84.39 ± 2.10	82.56 ± 1.22	83.31 ± 2.18	78.02 ± 3.07	82.78 ± 1.76	81.76 ± 1.56
	20%	80.70 ± 1.67	82.72 ± 2.21	79.13 ± 3.45	79.80 ± 2.07	75.42 ± 2.31	78.06 ± 3.40	71.80 ± 4.69
	25%	80.26 ± 2.27	81.07 ± 2.34	75.97 ± 4.30	74.76 ± 5.56	58.88 ± 15.74	72.86 ± 2.48	67.90 ± 6.12
	30%	78.51 ± 1.63	81.65 ± 1.59	76.41 ± 4.60	75.14 ± 5.28	69.94 ± 4.82	73.52 ± 2.53	68.32 ± 5.45
	35%	73.81 ± 3.77	79.85 ± 2.49	73.29 ± 3.07	72.30 ± 4.86	60.68 ± 3.20	66.38 ± 2.98	59.20 ± 7.13
	40%	67.64 ± 7.50	72.79 ± 4.22	62.71 ± 11.74	65.73 ± 4.57	47.32 ± 7.82	62.28 ± 2.69	52.10 ± 4.29
	45%	66.57 ± 4.85	65.24 ± 12.72	59.64 ± 4.18	60.89 ± 9.29	47.34 ± 8.31	50.44 ± 4.10	47.58 ± 2.73
	50%	54.44 ± 15.40	59.12 ± 8.51	55.68 ± 10.17	53.30 ± 14.42	42.82 ± 6.47	42.28 ± 5.31	37.44 ± 4.78
CGNN	5%	78.63 ± 19.03	80.04 ± 8.30	83.18 ± 6.80	81.18 ± 7.87	85.16 ± 0.73	80.86 ± 10.56	82.54 ± 4.99
	10%	76.07 ± 18.90	83.07 ± 4.07	83.35 ± 9.03	79.74 ± 8.94	82.96 ± 4.43	79.02 ± 10.37	81.12 ± 5.21
	15%	80.45 ± 7.13	83.05 ± 4.10	80.35 ± 9.03	79.74 ± 8.94	81.38 ± 1.74	78.98 ± 10.34	81.06 ± 5.18
	20%	73.21 ± 19.76	79.10 ± 8.58	78.41 ± 7.76	75.76 ± 11.76	70.86 ± 21.17	76.78 ± 5.48	74.84 ± 1.98
	25%	66.11 ± 25.33	78.08 ± 8.86	77.11 ± 8.13	73.26 ± 11.95	61.58 ± 26.82	75.54 ± 3.75	71.56 ± 5.16
	30%	72.41 ± 15.52	78.10 ± 8.97	77.18 ± 8.16	73.28 ± 11.91	56.72 ± 27.75	75.42 ± 3.90	71.54 ± 5.15
	35%	70.02 ± 7.69	75.58 ± 12.90	76.26 ± 8.14	74.76 ± 9.04	60.44 ± 17.94	74.62 ± 15.10	58.70 ± 9.40
	40%	63.27 ± 20.26	71.59 ± 7.20	70.86 ± 7.65	65.24 ± 13.69	58.22 ± 4.96	70.40 ± 12.82	50.64 ± 6.31
	45%	60.68 ± 20.05	64.89 ± 14.76	60.57 ± 18.37	65.28 ± 13.36	49.30 ± 15.49	46.50 ± 9.65	42.62 ± 10.67
	50%	53.02 ± 24.13	60.62 ± 12.01	53.31 ± 16.99	63.16 ± 7.16	44.48 ± 5.12	36.66 ± 11.19	37.14 ± 8.64
DeGLIF	5%	85.46 ± 0.24	85.48 ± 0.71	86.20 ± 0.45	85.04 ± 0.95	85.44 ± 0.70	85.48 ± 0.64	85.98 ± 0.78
	10%	84.98 ± 0.82	85.04 ± 0.51	85.78 ± 0.78	84.68 ± 1.23	84.54 ± 0.51	84.58 ± 0.53	84.38 ± 1.20
	15%	85.16 ± 0.55	85.02 ± 0.50	85.90 ± 0.72	84.66 ± 1.27	84.46 ± 0.69	84.62 ± 0.53	84.36 ± 1.02
	20%	83.82 ± 0.78	84.24 ± 0.37	84.20 ± 0.73	83.74 ± 1.38	83.32 ± 1.13	83.16 ± 2.11	82.38 ± 1.61
	25%	83.80 ± 1.37	84.84 ± 1.16	84.84 ± 0.40	84.06 ± 2.55	81.68 ± 0.96	81.54 ± 2.83	80.20 ± 2.49
	30%	84.20 ± 1.37	84.58 ± 1.29	84.94 ± 0.36	84.1 ± 2.51	78.82 ± 1.00	81.58 ± 2.83	80.30 ± 2.52
	35%	82.82 ± 1.05	84.04 ± 1.33	83.90 ± 1.02	84.14 ± 1.84	74.80 ± 1.69	79.30 ± 2.97	76.74 ± 2.70
	40%	82.44 ± 1.04	82.50 ± 1.28	82.04 ± 1.05	81.52 ± 1.4	69.68 ± 2.57	73.72 ± 1.99	65.42 ± 2.93
	45%	80.68 ± 1.42	81.56 ± 0.21	80.20 ± 1.85	80.36 ± 1.43	62.48 ± 2.73	65.86 ± 4.16	58.60 ± 4.54
	50%	78.06 ± 1.66	79.94 ± 0.88	77.54 ± 2.32	79.68 ± 1.23	53.80 ± 2.77	58.48 ± 3.92	50.

Table 8: Comparison of noise model variants across noise robust algorithms for graphs for Amazon Photo dataset. Reported values are accuracy  $\pm$  std of 10 repetitions

Noise-Robust method	Noise Level	SLN	MV+SLN	Veto+SLN	Sequential	CCN	MV+CCN	Veto+CCN
GCN	5%	86.78 ± 1.43	83.65 ± 6.28	85.05 ± 4.56	83.55 ± 6.18	86.66 ± 1.46	84.65 ± 5.59	85.35 ± 4.21
	10%	86.45 ± 1.16	82.29 ± 12.38	84.14 ± 3.82	83.54 ± 4.67	85.58 ± 1.32	84.38 ± 5.67	83.60 ± 3.27
	15%	85.49 ± 1.21	82.30 ± 12.38	84.16 ± 3.85	83.55 ± 4.67	83.53 ± 1.19	84.39 ± 5.69	83.58 ± 3.26
	20%	82.83 ± 3.66	82.86 ± 6.06	83.05 ± 3.65	80.82 ± 5.00	79.72 ± 4.84	77.60 ± 10.34	77.68 ± 6.76
	25%	83.96 ± 2.99	78.28 ± 9.38	81.87 ± 4.08	80.58 ± 7.92	77.00 ± 5.47	74.15 ± 9.42	70.81 ± 7.69
	30%	81.15 ± 9.72	78.26 ± 9.39	81.88 ± 4.03	80.66 ± 7.91	70.94 ± 12.13	74.16 ± 9.41	70.82 ± 7.69
	35%	83.01 ± 3.82	76.80 ± 11.90	77.65 ± 7.65	78.01 ± 9.09	62.77 ± 7.32	69.21 ± 9.21	63.43 ± 4.89
	40%	78.75 ± 4.02	76.00 ± 10.41	71.06 ± 12.34	70.89 ± 9.41	54.20 ± 7.31	56.45 ± 8.28	49.66 ± 3.14
DGNN	5%	78.32 ± 4.81	82.68 ± 2.81	79.80 ± 1.65	78.08 ± 4.58	74.66 ± 9.15	82.50 ± 0.95	78.38 ± 7.58
	10%	78.80 ± 5.07	81.06 ± 2.48	68.90 ± 11.77	70.38 ± 9.41	76.74 ± 2.93	82.14 ± 0.84	70.94 ± 8.00
	15%	72.60 ± 12.99	81.04 ± 2.57	67.34 ± 13.42	70.28 ± 9.06	72.40 ± 4.04	82.22 ± 0.91	74.00 ± 7.08
	20%	77.08 ± 4.10	80.66 ± 2.09	70.38 ± 9.93	67.88 ± 8.07	67.66 ± 8.22	78.82 ± 2.40	63.24 ± 10.91
	25%	74.90 ± 5.87	79.38 ± 2.39	65.20 ± 11.22	65.38 ± 13.62	61.78 ± 9.81	77.36 ± 3.91	53.28 ± 12.29
	30%	60.32 ± 21.55	79.54 ± 2.03	64.58 ± 11.17	64.74 ± 14.17	61.82 ± 11.15	77.14 ± 3.63	48.86 ± 11.79
	35%	59.96 ± 16.53	74.50 ± 8.68	55.26 ± 18.68	61.84 ± 8.26	53.28 ± 10.14	77.08 ± 4.68	49.30 ± 17.08
	40%	65.90 ± 15.86	70.68 ± 7.12	54.36 ± 9.28	52.16 ± 14.51	45.02 ± 10.60	58.94 ± 9.51	38.84 ± 8.29
PIGNN	5%	21.08 ± 4.92	17.96 ± 4.35	12.48 ± 6.00	17.94 ± 9.13	21.86 ± 8.10	18.86 ± 7.83	21.22 ± 3.38
	10%	19.94 ± 7.48	14.94 ± 4.61	19.20 ± 7.99	20.70 ± 8.19	18.26 ± 11.33	17.36 ± 6.67	21.26 ± 8.09
	15%	17.56 ± 8.72	14.94 ± 4.61	19.20 ± 7.99	20.70 ± 8.19	14.84 ± 4.97	17.36 ± 6.67	21.26 ± 8.09
	20%	14.62 ± 7.45	17.64 ± 6.92	16.94 ± 4.65	18.68 ± 6.01	17.00 ± 5.09	19.94 ± 7.62	24.86 ± 3.19
	25%	19.92 ± 9.58	13.32 ± 9.69	15.34 ± 4.95	21.42 ± 4.99	19.98 ± 4.25	13.80 ± 7.88	22.36 ± 1.39
	30%	21.98 ± 4.49	13.32 ± 9.69	15.34 ± 4.95	21.42 ± 4.99	17.30 ± 2.94	13.80 ± 7.88	22.36 ± 1.39
	35%	13.12 ± 6.54	14.64 ± 7.55	12.52 ± 4.85	21.08 ± 9.06	16.98 ± 6.63	21.50 ± 9.90	21.56 ± 1.83
	40%	17.98 ± 7.14	18.02 ± 8.63	14.34 ± 4.56	17.80 ± 6.41	18.62 ± 8.50	20.74 ± 9.50	19.72 ± 5.88
RNCGLN	5%	83.82 ± 5.00	84.06 ± 4.05	85.32 ± 2.00	87.04 ± 2.01	83.78 ± 2.71	82.08 ± 3.42	88.32 ± 2.02
	10%	85.52 ± 1.86	83.14 ± 4.53	80.24 ± 5.90	83.90 ± 1.57	81.86 ± 4.17	84.46 ± 4.02	83.10 ± 2.46
	15%	84.50 ± 1.95	83.14 ± 4.53	80.24 ± 5.90	83.90 ± 1.57	82.04 ± 1.87	84.46 ± 4.02	83.10 ± 2.46
	20%	81.24 ± 3.62	85.02 ± 0.80	77.46 ± 7.44	76.52 ± 4.67	75.88 ± 5.39	83.08 ± 5.55	75.50 ± 7.64
	25%	80.26 ± 5.05	80.24 ± 3.99	71.54 ± 6.55	70.50 ± 4.53	71.94 ± 5.37	77.00 ± 9.12	64.98 ± 3.93
	30%	79.46 ± 4.74	80.24 ± 3.99	71.54 ± 6.55	70.50 ± 4.53	70.36 ± 10.52	77.00 ± 9.12	64.98 ± 3.93
	35%	64.16 ± 6.37	70.26 ± 4.10	68.54 ± 2.74	70.34 ± 8.76	66.32 ± 8.12	70.04 ± 11.88	59.96 ± 4.31
	40%	67.42 ± 9.70	67.14 ± 7.35	55.20 ± 5.68	62.42 ± 9.45	58.42 ± 7.35	60.54 ± 7.37	49.44 ± 4.91
RTGNN	5%	56.52 ± 5.79	61.22 ± 6.57	51.68 ± 5.66	55.40 ± 5.21	52.40 ± 8.32	63.90 ± 8.12	42.58 ± 2.93
	10%	19.36 ± 12.63	21.12 ± 8.23	15.92 ± 7.36	17.84 ± 8.43	17.40 ± 7.52	24.76 ± 7.70	22.34 ± 0.25
	15%	16.16 ± 10.19	29.88 ± 8.31	15.74 ± 6.14	16.08 ± 6.98	19.98 ± 5.28	17.64 ± 3.43	22.30 ± 0.27
	20%	44.56 ± 3.34	40.07 ± 5.07	33.59 ± 4.17	34.07 ± 5.18	43.76 ± 6.15	39.36 ± 3.53	28.10 ± 10.78
	25%	39.81 ± 5.97	35.34 ± 6.00	30.60 ± 4.35	30.39 ± 2.28	37.60 ± 13.26	35.20 ± 2.47	34.68 ± 4.63
	30%	33.71 ± 14.71	35.67 ± 6.01	30.87 ± 4.51	30.65 ± 1.62	35.10 ± 8.70	36.37 ± 1.51	33.98 ± 4.09
	35%	32.75 ± 9.83	30.65 ± 3.74	27.40 ± 4.06	29.90 ± 4.68	26.20 ± 8.51	31.79 ± 6.64	27.89 ± 9.11
	40%	34.44 ± 7.69	28.36 ± 7.81	25.17 ± 2.44	23.35 ± 0.92	27.96 ± 9.76	32.64 ± 7.92	26.33 ± 8.67
NRGNN	5%	31.52 ± 3.53	28.52 ± 7.88	24.56 ± 2.72	23.79 ± 1.23	26.37 ± 8.18	33.35 ± 9.70	26.16 ± 8.80
	10%	17.61 ± 4.97	27.40 ± 6.63	19.31 ± 4.29	16.61 ± 4.42	29.19 ± 10.97	36.40 ± 5.79	25.86 ± 5.97
	15%	24.40 ± 2.02	23.62 ± 8.72	18.86 ± 5.53	18.50 ± 7.54	25.56 ± 9.78	26.35 ± 7.73	20.77 ± 5.79
	20%	19.66 ± 6.29	26.07 ± 2.61	21.18 ± 8.44	18.31 ± 7.92	22.11 ± 5.72	27.14 ± 7.14	18.76 ± 5.72
	25%	21.00 ± 7.52	27.17 ± 2.11	16.96 ± 6.08	19.00 ± 3.41	24.18 ± 10.74	28.79 ± 5.04	18.71 ± 2.98
	30%	24.22 ± 4.85	31.72 ± 7.29	24.44 ± 9.76	23.36 ± 1.99	35.38 ± 5.77	31.18 ± 4.76	25.32 ± 5.59
	35%	27.22 ± 6.38	27.88 ± 4.56	27.80 ± 5.43	23.76 ± 7.56	31.06 ± 6.98	33.16 ± 3.14	26.08 ± 7.02
	40%	27.72 ± 6.41	27.88 ± 4.56	27.80 ± 5.43	23.76 ± 7.56	30.46 ± 14.21	33.16 ± 3.14	26.08 ± 7.02
CRGNN	5%	22.70 ± 10.23	31.54 ± 4.34	24.22 ± 7.30	20.10 ± 4.41	22.78 ± 2.94	33.62 ± 1.16	29.44 ± 3.29
	10%	26.28 ± 2.28	29.54 ± 3.32	21.18 ± 5.40	29.28 ± 4.00	27.68 ± 7.92	28.64 ± 9.83	28.84 ± 6.27
	15%	30.20 ± 5.01	29.54 ± 3.32	21.18 ± 5.40	29.28 ± 4.00	25.00 ± 6.91	28.64 ± 9.83	28.84 ± 6.27
	20%	16.36 ± 3.93	30.00 ± 10.68	17.60 ± 5.55	23.68 ± 6.50	24.84 ± 6.34	27.56 ± 5.17	29.02 ± 6.80
	25%	29.74 ± 8.16	24.06 ± 10.29	17.44 ± 6.51	18.04 ± 6.57	22.74 ± 8.99	25.50 ± 9.73	22.14 ± 10.42
	30%	25.26 ± 10.75	30.46 ± 4.41	21.70 ± 15.16	25.90 ± 9.22	19.76 ± 3.52	31.74 ± 5.13	19.32 ± 12.87
	35%	26.08 ± 5.18	25.70 ± 7.98	20.24 ± 4.96	20.24 ± 8.84	19.64 ± 6.67	27.14 ± 3.72	24.28 ± 11.53
	40%	59.04 ± 12.73	44.60 ± 12.81	54.28 ± 14.68	54.52 ± 14.41	54.80 ± 12.30	52.82 ± 12.77	47.36 ± 15.24
DeGLIF	5%	47.82 ± 7.18	49.66 ± 8.69	52.98 ± 20.93	56.80 ± 15.44	49.50 ± 22.16	48.52 ± 16.00	42.60 ± 10.71
	10%	45.18 ± 11.56	50.88 ± 10.12	52.66 ± 19.01	55.70 ± 17.17	46.32 ± 16.69	50.60 ± 14.56	43.18 ± 8.97
	15%	28.26 ± 16.21	36.92 ± 11.71	41.66 ± 13.60	30.96 ± 15.38	51.22 ± 18.45	49.02 ± 12.78	46.08 ± 13.86
	20%	45.02 ± 10.86	37.82 ± 11.13	35.76 ± 11.64	35.22 ± 14.65	47.68 ± 20.70	31.22 ± 7.03	41.32 ± 7.76
	25%	23.20 ± 10.72	34.80 ± 13.36	34.20 ± 8.65	34.04 ± 14.97	35.78 ± 10.66	37.42 ± 9.29	39.16 ± 4.63
	30%	25.78 ± 10.25	34.08 ± 12.27	29.32 ± 5.16	27.10 ± 5.88	30.62 ± 13.45	34.92 ± 5.10	36.94 ± 7.39
	35%	30.56 ± 4.71	35.72 ± 10.82	29.00 ± 8.54	22.84 ± 6.12	34.36 ± 13.35	36.58 ± 13.16	30.90 ± 9.06
	40%	29.48 ± 15.05	31.20 ± 5.21	23.12 ± 5.72	18.82 ± 4.97	33.14 ± 13.04	37.74 ± 8.31	27.42 ± 4.28
CGNN	5%	22.32 ± 7.22	44.60 ± 11.81	18.96 ± 9.50	22.50 ± 6.74	22.00 ± 4.49	30.28 ± 6.45	27.88 ± 3.31
	10%	39.08 ± 28.12	28.70 ± 12.19	23.32 ± 6.22	33.60 ± 21.41	33.82 ± 19.18	25.10 ± 7.71	32.08 ± 11.53
	15%	34.84 ± 21.85	21.94 ± 9.72	26.16 ± 9.72	27.18 ± 22.91	36.48 ± 14.53	22.44 ± 7.35	26.90 ± 9.63
	20%	31.26 ± 24.51	19.46 ± 10.57	26.30 ± 10.02	27.52 ± 22.67	41.60 ± 23.20	22.44 ± 7.34	26.66 ± 9.52
	25%	35.18 ± 19.95	27.46 ± 8.12	27.58 ± 14.10	29.90 ± 21.35	29.64 ± 14.72	19.42 ± 6.97	31.82 ± 10.28
	30%	34.08 ± 23.35	22.70 ± 8.20	24.30 ± 5.93	25.88 ± 24.09	31.26 ± 18.21	22.48 ± 3.59	29.08 ± 7.08
	35%	31.98 ± 14.61	22.32 ± 8.40	24.38 ± 5.96	25.72 ± 23.30	29.58 ± 16.67	22.38 ± 3.70	29.10 ± 7.20
	40%	22.42 ± 10.69	16.68 ± 7.75	28.20 ± 16.37	28.30 ± 23.73	40.74 ± 20.02	21.70 ± 8.10	25.56 ± 5.51
DeGLIF	5%	28.72 ± 11.36	18.12 ± 10.43	24.04 ± 9.91	20.62 ± 12.20	22.00 ± 16.94	24.02 ± 7.07	27.00 ± 4.35
	10%	16.62 ± 9.35	17.40 ± 9.27	20.84 ± 7.90	22.96 ± 11.08	22.74 ± 12.74	24.44 ± 7.80	25.78 ± 7.39
	15%	25.10 ± 9.55	20.32 ± 8.24	23.74 ± 5.31	24.00 ± 8.78	25.22 ± 12.10	19.60 ± 8.02	24.78 ± 8.12
	20%	88.79 ± 2.60	88.77 ± 2.79	87.04 ± 6.67	89.41 ± 1.99	88.20 ± 2.12	87.73 ± 2.32	88.86 ± 2.41
	25%	88.18 ± 2.43	84.99 ± 10.31	85.32 ± 5.52	87.67 ± 3.37	87.91 ± 2.27	89.13 ± 2.21	83.20 ± 10.25
	30%	88.34 ± 2.08	85.05 ± 10.33	85.56 ± 5.64	88.20 ± 3.00	85.68 ± 5.49	89.07 ± 2.19	83.40 ± 10.35
	35%	88.29 ± 1.64	86.57 ± 5.97	75.16 ± 24.20	83.70 ± 6.00	84.14 ± 8.42	87.63 ± 1.88	81.98 ± 6.83
	40%	87.33 ± 2.74	85.71 ± 6.37	86.17 ± 3.31	85.68 ± 5.04	86.63 ± 1.84	87.60 ± 2.01	73.27 ± 16.10
DeGLIF	5%	88.11 ± 1.47	85.88 ± 6.49	85.68 ± 4.32	85.47 ± 4.64	82.74 ± 3.94	87.70 ± 2.09	71.72 ± 15.85
	10%	87.73 ± 1.93	88.66 ± 0.57	82.34 ± 5.53	82.18 ± 5.70	75.29 ± 6.52	83.76 ± 3.54	66.87 ± 5.86
	15%	86.75 ± 2.57	86.07 ± 1.27	73.32 ± 9.49	81.26 ± 3.58	72.46 ± 6.93	75.86 ± 7.05	52.50 ± 8.55
	20%	84.85 ± 2.21	83.60 ± 2.00	75.33 ± 7.08	78.58 ± 6.30	60.11 ± 3.78	63.50 ± 6.69	44.94 ± 2.33
	25%	80.60 ± 4.75	83.35 ± 1.93	67.70 ± 13.65	73.88 ± 7.90	48.40 ± 7.31	68.81 ± 9.18	36.33 ± 3.81
	30%	88.79 ± 2.60	88.77 ± 2.79	87.04 ± 6.67	89.41 ± 1.99	88.20 ± 2.12	87.73 ± 2.32	88.86 ± 2.41
	35%	88.18 ± 2.43	84.99 ± 10.31	85.32 ± 5.52	87.67 ± 3.37	87.91 ± 2.27	89.13 ± 2.21	83.20 ± 10.25
	40%	88.34 ± 2.08	85.05 ± 10.33	85.56 ± 5.64	88.20 ± 3.00	85.68 ± 5.49	89.07 ± 2.19	83.40 ± 10.35