Additional material for our paper: Detection of contextual anomalies in attributed graphs.

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Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_0	0.98 ± 0.03	0.96 ± 0.03	0.87 ± 0.09	0.56 ± 0.16	0.85 ± 0.13	0.92 ± 0.12
CoBaGAD loops A_0	0.76 ± 0.05	0.89 ± 0.14	0.95 ± 0.03	0.87 ± 0.09	0.22 ± 0.1	0.69 ± 0.07
GAT A_0	0.96 ± 0.04	0.5 ± 0.24	0.29 ± 0.02	0.55 ± 0.08	0.59 ± 0.13	0.93 ± 0.1
GAT loops A_0	0.68 ± 0.04	0.83 ± 0.02	0.33 ± 0.08	0.43 ± 0.09	0.18 ± 0.04	0.59 ± 0.02
GCN A_0	0.34 ± 0.02	0.11 ± 0.0	0.1 ± 0.0	0.18 ± 0.02	0.23 ± 0.02	0.26 ± 0.02
GCN loops A_0	0.24 ± 0.0	0.12 ± 0.01	0.11 ± 0.0	0.16 ± 0.02	0.31 ± 0.03	0.14 ± 0.01
GraphSAGE A_0	0.51 ± 0.03	0.51 ± 0.03	0.63 ± 0.05	0.44 ± 0.08	0.34 ± 0.05	0.52 ± 0.03
GraphSAGE loops A_0	0.53 ± 0.01	0.56 ± 0.03	0.54 ± 0.12	0.41 ± 0.05	0.36 ± 0.08	0.5 ± 0.05

Table 1: Precision of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.53 ± 0.0	0.98 ± 0.02
GAT A_0	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.6 ± 0.09	1.0 ± 0.0
GCN A_0	0.94 ± 0.02	0.95 ± 0.02	0.96 ± 0.05	0.94 ± 0.0	0.89 ± 0.03	0.83 ± 0.04
GCN loops A_0	0.86 ± 0.03	0.96 ± 0.05	0.96 ± 0.01	1.0 ± 0.0	0.89 ± 0.08	0.85 ± 0.07
GraphSAGE A_0	1.0 ± 0.0	1.0 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE loops A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01

Table 2: Recall of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.97 ± 0.0	1.0 ± 0.0
GAT A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.97 ± 0.01	1.0 ± 0.0
GCN A_0	1.0 ± 0.0	0.99 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.0	0.99 ± 0.0
GCN loops A_0	0.99 ± 0.0	1.0 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	0.99 ± 0.01
GraphSAGE A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE loops A_0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 3: Precision of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	0.95 ± 0.03	0.99 ± 0.01	0.99 ± 0.01
CoBaGAD loops A_0	0.98 ± 0.01	0.99 ± 0.01	1.0 ± 0.0	0.99 ± 0.01	0.85 ± 0.08	0.97 ± 0.01
GAT A_0	1.0 ± 0.0	0.91 ± 0.06	0.88 ± 0.01	0.95 ± 0.02	0.95 ± 0.03	0.99 ± 0.01
GAT loops A_0	0.97 ± 0.01	0.99 ± 0.0	0.89 ± 0.03	0.92 ± 0.03	0.83 ± 0.03	0.95 ± 0.0
GCN A_0	0.88 ± 0.01	0.5 ± 0.02	0.59 ± 0.02	0.74 ± 0.03	0.81 ± 0.03	0.85 ± 0.02
GCN loops A_0	0.82 ± 0.0	0.54 ± 0.05	0.63 ± 0.01	0.69 ± 0.05	0.87 ± 0.02	0.65 ± 0.05
GraphSAGE A_0	0.94 ± 0.01	0.94 ± 0.01	0.97 ± 0.01	0.92 ± 0.03	0.87 ± 0.03	0.94 ± 0.01
GraphSAGE loops A_0	0.94 ± 0.0	0.95 ± 0.01	0.95 ± 0.02	0.91 ± 0.02	0.88 ± 0.04	0.93 ± 0.01

Table 4: Recall of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_1	0.96 ± 0.03	0.92 ± 0.11	0.78 ± 0.29	0.69 ± 0.22	0.72 ± 0.15	0.85 ± 0.12
CoBaGAD loops A_1	0.72 ± 0.03	0.98 ± 0.02	0.78 ± 0.1	0.73 ± 0.05	0.44 ± 0.22	0.69 ± 0.02
GAT A_1	0.74 ± 0.3	0.55 ± 0.21	0.51 ± 0.14	0.63 ± 0.07	0.46 ± 0.19	0.8 ± 0.18
GAT loops A_1	0.71 ± 0.01	0.4 ± 0.06	0.33 ± 0.03	0.61 ± 0.12	0.25 ± 0.09	0.54 ± 0.04
GCN A_1	0.34 ± 0.02	0.11 ± 0.01	0.12 ± 0.02	0.19 ± 0.03	0.32 ± 0.02	0.26 ± 0.01
GCN loops A_1	0.24 ± 0.01	0.19 ± 0.03	0.13 ± 0.02	0.18 ± 0.02	0.34 ± 0.04	0.16 ± 0.01
GraphSAGE A_1	0.46 ± 0.04	0.49 ± 0.04	0.51 ± 0.06	0.39 ± 0.06	0.38 ± 0.07	0.47 ± 0.04
GraphSAGE loops A_1	0.41 ± 0.02	0.5 ± 0.02	0.49 ± 0.03	0.38 ± 0.08	0.31 ± 0.07	0.47 ± 0.03

Table 5: Precision of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_1	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.02	0.96 ± 0.03	0.96 ± 0.06	0.98 ± 0.01
CoBaGAD loops A_1	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.02	0.98 ± 0.03	0.64 ± 0.03	0.99 ± 0.01
GAT A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_1	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	0.58 ± 0.13	1.0 ± 0.0
GCN A_1	0.98 ± 0.01	0.92 ± 0.04	0.89 ± 0.06	0.96 ± 0.03	1.0 ± 0.0	0.86 ± 0.03
GCN loops A_1	0.95 ± 0.01	1.0 ± 0.01	0.9 ± 0.03	0.96 ± 0.03	1.0 ± 0.0	0.88 ± 0.1
GraphSAGE A_1	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	0.98 ± 0.03	0.98 ± 0.03	1.0 ± 0.0
GraphSAGE loops A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 6: Recall of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.0	1.0 ± 0.0
GAT A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.97 ± 0.01	1.0 ± 0.0
GCN A_1	1.0 ± 0.0	0.99 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.0
GCN loops A_1	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01
GraphSAGE A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE loops A_1	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 7: Precision of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_1	1.0 ± 0.0	0.99 ± 0.01	0.97 ± 0.04	0.97 ± 0.03	0.97 ± 0.02	0.99 ± 0.01
CoBaGAD loops A_1	0.98 ± 0.0	1.0 ± 0.0	0.98 ± 0.01	0.98 ± 0.01	0.92 ± 0.05	0.97 ± 0.0
GAT A_1	0.95 ± 0.06	0.93 ± 0.04	0.94 ± 0.04	0.96 ± 0.01	0.9 ± 0.06	0.98 ± 0.02
GAT loops A_1	0.97 ± 0.0	0.91 ± 0.02	0.89 ± 0.02	0.96 ± 0.02	0.88 ± 0.04	0.95 ± 0.01
GCN A_1	0.88 ± 0.01	0.52 ± 0.04	0.61 ± 0.03	0.74 ± 0.06	0.86 ± 0.01	0.84 ± 0.01
GCN loops A_1	0.8 ± 0.0	0.73 ± 0.05	0.63 ± 0.09	0.72 ± 0.05	0.87 ± 0.02	0.71 ± 0.04
GraphSAGE A_1	0.93 ± 0.01	0.93 ± 0.01	0.94 ± 0.01	0.9 ± 0.02	0.89 ± 0.03	0.93 ± 0.01
GraphSAGE loops A_1	0.91 ± 0.01	0.94 ± 0.0	0.94 ± 0.01	0.89 ± 0.03	0.85 ± 0.05	0.93 ± 0.01

Table 8: Recall of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_2	0.61 ± 0.04	0.61 ± 0.02	0.58 ± 0.2	0.47 ± 0.14	0.64 ± 0.15	0.72 ± 0.06
CoBaGAD loops A_2	0.46 ± 0.01	0.62 ± 0.06	0.34 ± 0.01	0.35 ± 0.15	0.26 ± 0.14	0.48 ± 0.06
GAT A_2	0.52 ± 0.02	0.41 ± 0.04	0.29 ± 0.03	0.32 ± 0.07	0.3 ± 0.03	0.51 ± 0.11
GAT loops A_2	0.43 ± 0.02	0.42 ± 0.1	0.25 ± 0.01	0.35 ± 0.06	0.18 ± 0.03	0.49 ± 0.03
GCN A_2	0.27 ± 0.02	0.12 ± 0.0	0.13 ± 0.01	0.17 ± 0.01	0.25 ± 0.02	0.23 ± 0.03
GCN loops A_2	0.16 ± 0.01	0.11 ± 0.0	0.14 ± 0.01	0.2 ± 0.04	0.19 ± 0.04	0.14 ± 0.0
GraphSAGE A_2	0.33 ± 0.01	0.37 ± 0.01	0.43 ± 0.04	0.44 ± 0.05	0.27 ± 0.05	0.38 ± 0.01
GraphSAGE loops A_2	0.32 ± 0.03	0.38 ± 0.02	0.44 ± 0.03	0.41 ± 0.04	0.33 ± 0.03	0.32 ± 0.04

Table 9: Precision of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_2	1.0 ± 0.0	0.99 ± 0.0	0.98 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01
CoBaGAD loops A_2	1.0 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.67 ± 0.14	0.98 ± 0.02
GAT A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.96 ± 0.06	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.67 ± 0.05	0.99 ± 0.01
GCN A_2	0.93 ± 0.03	0.84 ± 0.01	0.91 ± 0.02	1.0 ± 0.0	0.96 ± 0.03	0.85 ± 0.08
GCN loops A_2	0.9 ± 0.02	0.97 ± 0.02	0.94 ± 0.02	0.9 ± 0.07	0.82 ± 0.11	0.83 ± 0.09
GraphSAGE A_2	0.99 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.93 ± 0.09	1.0 ± 0.0
GraphSAGE loops A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01

Table 10: Recall of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.01	1.0 ± 0.0
GAT A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.97 ± 0.0	1.0 ± 0.0
GCN A_2	0.99 ± 0.0	0.98 ± 0.0	0.99 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01
GCN loops A_2	0.99 ± 0.0	1.0 ± 0.0	0.99 ± 0.0	0.99 ± 0.01	0.99 ± 0.01	0.98 ± 0.01
GraphSAGE A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.01	1.0 ± 0.0
GraphSAGE loops A_2	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 11: Precision of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_2	0.96 ± 0.01	0.96 ± 0.0	0.94 ± 0.05	0.92 ± 0.05	0.96 ± 0.02	0.97 ± 0.01
CoBaGAD loops A_2	0.93 ± 0.0	0.96 ± 0.01	0.88 ± 0.01	0.86 ± 0.07	0.86 ± 0.06	0.93 ± 0.02
GAT A_2	0.94 ± 0.01	0.91 ± 0.01	0.85 ± 0.02	0.87 ± 0.06	0.85 ± 0.02	0.93 ± 0.03
GAT loops A_2	0.92 ± 0.01	0.91 ± 0.03	0.82 ± 0.01	0.88 ± 0.03	0.8 ± 0.04	0.93 ± 0.01
GCN A_2	0.84 ± 0.01	0.59 ± 0.02	0.63 ± 0.05	0.72 ± 0.01	0.81 ± 0.02	0.82 ± 0.03
GCN loops A_2	0.7 ± 0.01	0.5 ± 0.02	0.64 ± 0.05	0.78 ± 0.06	0.77 ± 0.04	0.68 ± 0.03
GraphSAGE A_2	0.87 ± 0.01	0.89 ± 0.0	0.92 ± 0.01	0.92 ± 0.02	0.83 ± 0.04	0.9 ± 0.0
GraphSAGE loops A_2	0.87 ± 0.02	0.89 ± 0.01	0.92 ± 0.01	0.91 ± 0.01	0.87 ± 0.02	0.86 ± 0.03

Table 12: Recall of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_3	0.18 ± 0.0	0.27 ± 0.0	0.44 ± 0.05	0.21 ± 0.01	0.33 ± 0.08	0.13 ± 0.0
CoBaGAD loops A_3	0.99 ± 0.01	0.99 ± 0.01	0.95 ± 0.05	0.91 ± 0.13	0.89 ± 0.15	0.93 ± 0.02
GAT A_3	0.17 ± 0.01	0.36 ± 0.16	0.45 ± 0.12	0.22 ± 0.06	0.37 ± 0.23	0.09 ± 0.02
GAT loops A_3	0.82 ± 0.07	0.79 ± 0.03	0.78 ± 0.07	0.55 ± 0.03	0.43 ± 0.01	0.61 ± 0.09
GCN A_3	0.07 ± 0.0	0.06 ± 0.0	0.06 ± 0.0	0.06 ± 0.0	0.07 ± 0.0	0.06 ± 0.0
GCN loops A_3	0.95 ± 0.02	0.97 ± 0.02	0.91 ± 0.07	0.8 ± 0.21	0.94 ± 0.08	0.78 ± 0.04
GraphSAGE A_3	1.0 ± 0.0	0.95 ± 0.04	0.97 ± 0.04	0.71 ± 0.1	0.65 ± 0.29	0.8 ± 0.11
GraphSAGE loops A_3	0.93 ± 0.08	0.99 ± 0.01	0.84 ± 0.09	0.66 ± 0.1	0.68 ± 0.24	0.97 ± 0.03

Table 13: Precision of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_3	1.0 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT A_3	0.98 ± 0.02	0.9 ± 0.08	0.96 ± 0.04	0.81 ± 0.15	0.84 ± 0.08	0.89 ± 0.06
GAT loops A_3	1.0 ± 0.0	1.0 ± 0.01	0.99 ± 0.02	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GCN A_3	0.58 ± 0.04	0.59 ± 0.09	0.73 ± 0.06	0.67 ± 0.08	0.58 ± 0.11	0.93 ± 0.02
GCN loops A_3	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.02
GraphSAGE A_3	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	0.98 ± 0.03	1.0 ± 0.0
GraphSAGE loops A_3	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.02	0.98 ± 0.03	0.98 ± 0.03	1.0 ± 0.0

Table 14: Recall of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT A_3	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	0.99 ± 0.01	0.99 ± 0.01	0.97 ± 0.03
GAT loops A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GCN A_3	0.95 ± 0.0	0.93 ± 0.0	0.94 ± 0.0	0.93 ± 0.01	0.95 ± 0.01	0.95 ± 0.01
GCN loops A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE loops A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 15: Precision of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_3	0.72 ± 0.01	0.83 ± 0.0	0.92 ± 0.01	0.77 ± 0.01	0.86 ± 0.05	0.56 ± 0.02
CoBaGAD loops A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	0.99 ± 0.01	0.99 ± 0.0
GAT A_3	0.68 ± 0.02	0.87 ± 0.07	0.91 ± 0.04	0.79 ± 0.1	0.84 ± 0.12	0.35 ± 0.14
GAT loops A_3	0.99 ± 0.01	0.98 ± 0.0	0.98 ± 0.01	0.95 ± 0.01	0.92 ± 0.0	0.96 ± 0.01
GCN A_3	0.49 ± 0.06	0.37 ± 0.06	0.29 ± 0.05	0.29 ± 0.05	0.47 ± 0.1	0.1 ± 0.01
GCN loops A_3	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	0.98 ± 0.03	1.0 ± 0.01	0.98 ± 0.0
GraphSAGE A_3	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.97 ± 0.01	0.94 ± 0.06	0.98 ± 0.01
GraphSAGE loops A_3	0.99 ± 0.01	1.0 ± 0.0	0.99 ± 0.01	0.97 ± 0.02	0.95 ± 0.05	1.0 ± 0.0

Table 16: Recall of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_4	0.88 ± 0.09	0.9 ± 0.03	0.97 ± 0.04	0.8 ± 0.07	0.56 ± 0.12	0.57 ± 0.08
CoBaGAD loops A_4	0.9 ± 0.1	0.95 ± 0.04	0.88 ± 0.05	0.61 ± 0.03	0.62 ± 0.1	0.89 ± 0.09
GAT A_4	0.44 ± 0.03	0.72 ± 0.02	0.77 ± 0.03	0.47 ± 0.17	0.51 ± 0.1	0.33 ± 0.04
GAT loops A_4	0.5 ± 0.07	0.77 ± 0.15	0.58 ± 0.12	0.67 ± 0.23	0.45 ± 0.1	0.43 ± 0.05
GCN A_4	0.12 ± 0.0	0.08 ± 0.0	0.07 ± 0.01	0.06 ± 0.02	0.08 ± 0.01	0.12 ± 0.02
GCN loops A_4	0.44 ± 0.01	0.7 ± 0.03	0.71 ± 0.12	0.6 ± 0.12	0.65 ± 0.07	0.35 ± 0.02
GraphSAGE A_4	0.46 ± 0.03	0.73 ± 0.04	0.69 ± 0.03	0.58 ± 0.11	0.61 ± 0.04	0.41 ± 0.03
GraphSAGE loops A_4	0.45 ± 0.02	0.73 ± 0.02	0.72 ± 0.02	0.53 ± 0.11	0.49 ± 0.06	0.36 ± 0.03

Table 17: Precision of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_4	1.0 ± 0.0	0.98 ± 0.02	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT A_4	1.0 ± 0.0	0.99 ± 0.01	0.98 ± 0.02	1.0 ± 0.0	0.98 ± 0.03	1.0 ± 0.0
GAT loops A_4	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01
GCN A_4	0.7 ± 0.02	0.82 ± 0.05	0.88 ± 0.17	0.72 ± 0.2	0.69 ± 0.06	0.7 ± 0.08
GCN loops A_4	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.02	0.98 ± 0.03	1.0 ± 0.0	0.99 ± 0.01
GraphSAGE A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.03	0.98 ± 0.03	0.99 ± 0.01
GraphSAGE loops A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.03	1.0 ± 0.0	0.98 ± 0.02

Table 18: Recall of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GCN A_4	0.97 ± 0.0	0.97 ± 0.0	0.99 ± 0.02	0.94 ± 0.06	0.96 ± 0.01	0.97 ± 0.01
GCN loops A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE loops A_4	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 19: Precision of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_4	0.99 ± 0.01	0.99 ± 0.0	1.0 ± 0.0	0.98 ± 0.01	0.94 ± 0.03	0.95 ± 0.02
CoBaGAD loops A_4	0.99 ± 0.01	1.0 ± 0.0	0.99 ± 0.0	0.96 ± 0.0	0.96 ± 0.02	0.99 ± 0.01
GAT A_4	0.92 ± 0.01	0.97 ± 0.0	0.98 ± 0.0	0.91 ± 0.05	0.93 ± 0.03	0.87 ± 0.03
GAT loops A_4	0.93 ± 0.02	0.98 ± 0.02	0.95 ± 0.02	0.95 ± 0.05	0.92 ± 0.03	0.92 ± 0.02
GCN A_4	0.69 ± 0.01	0.38 ± 0.04	0.18 ± 0.23	0.31 ± 0.07	0.5 ± 0.11	0.67 ± 0.04
GCN loops A_4	0.92 ± 0.0	0.97 ± 0.0	0.97 ± 0.01	0.95 ± 0.02	0.96 ± 0.01	0.88 ± 0.01
GraphSAGE A_4	0.92 ± 0.01	0.98 ± 0.0	0.97 ± 0.0	0.95 ± 0.02	0.96 ± 0.01	0.91 ± 0.01
GraphSAGE loops A_4	0.92 ± 0.01	0.98 ± 0.0	0.98 ± 0.0	0.94 ± 0.02	0.93 ± 0.02	0.89 ± 0.01

Table 20: Recall of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_5	0.84 ± 0.02	0.9 ± 0.03	0.82 ± 0.07	0.61 ± 0.03	0.51 ± 0.23	0.84 ± 0.22
CoBaGAD loops A_5	0.56 ± 0.04	0.8 ± 0.12	0.75 ± 0.07	0.48 ± 0.15	0.49 ± 0.03	0.5 ± 0.01
GAT A_5	0.69 ± 0.11	0.74 ± 0.11	0.54 ± 0.09	0.57 ± 0.07	0.52 ± 0.09	0.46 ± 0.1
GAT loops A_5	0.4 ± 0.06	0.74 ± 0.07	0.71 ± 0.09	0.5 ± 0.16	0.41 ± 0.01	0.38 ± 0.06
GCN A_5	0.11 ± 0.01	0.08 ± 0.0	0.07 ± 0.01	0.07 ± 0.0	0.08 ± 0.01	0.1 ± 0.01
GCN loops A_5	0.35 ± 0.01	0.67 ± 0.04	0.62 ± 0.07	0.6 ± 0.04	0.46 ± 0.13	0.23 ± 0.02
GraphSAGE A_5	0.32 ± 0.02	0.68 ± 0.0	0.68 ± 0.06	0.47 ± 0.02	0.56 ± 0.06	0.26 ± 0.05
GraphSAGE loops A_5	0.34 ± 0.01	0.68 ± 0.03	0.65 ± 0.06	0.51 ± 0.04	0.5 ± 0.04	0.3 ± 0.04

Table 21: Precision of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.03	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.96 ± 0.03	1.0 ± 0.0	1.0 ± 0.0
GAT A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_5	0.98 ± 0.03	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GCN A_5	0.72 ± 0.05	0.81 ± 0.04	0.78 ± 0.11	0.74 ± 0.09	0.6 ± 0.09	0.69 ± 0.07
GCN loops A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.03	0.99 ± 0.01
GraphSAGE A_5	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.01	1.0 ± 0.0	0.98 ± 0.03	0.98 ± 0.03
GraphSAGE loops A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.93 ± 0.05	0.99 ± 0.01

Table 22: Recall of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
CoBaGAD loops A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GAT loops A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GCN A_5	0.97 ± 0.0	0.97 ± 0.0	0.96 ± 0.01	0.96 ± 0.01	0.96 ± 0.01	0.98 ± 0.0
GCN loops A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0
GraphSAGE loops A_5	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 23: Precision of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_5	0.99 ± 0.0	0.99 ± 0.0	0.99 ± 0.01	0.96 ± 0.01	0.92 ± 0.05	0.99 ± 0.02
CoBaGAD loops A_5	0.95 ± 0.01	0.98 ± 0.01	0.98 ± 0.01	0.92 ± 0.04	0.93 ± 0.01	0.95 ± 0.0
GAT A_5	0.97 ± 0.02	0.98 ± 0.01	0.94 ± 0.02	0.95 ± 0.01	0.94 ± 0.02	0.93 ± 0.03
GAT loops A_5	0.9 ± 0.03	0.98 ± 0.01	0.97 ± 0.01	0.92 ± 0.04	0.91 ± 0.0	0.91 ± 0.02
GCN A_5	0.64 ± 0.05	0.41 ± 0.03	0.36 ± 0.18	0.41 ± 0.09	0.58 ± 0.02	0.68 ± 0.02
GCN loops A_5	0.88 ± 0.01	0.97 ± 0.01	0.96 ± 0.01	0.96 ± 0.01	0.92 ± 0.05	0.83 ± 0.02
GraphSAGE A_5	0.87 ± 0.02	0.97 ± 0.0	0.97 ± 0.01	0.93 ± 0.01	0.95 ± 0.01	0.85 ± 0.05
GraphSAGE loops A_5	0.88 ± 0.01	0.97 ± 0.0	0.97 ± 0.01	0.94 ± 0.01	0.94 ± 0.01	0.88 ± 0.02

Table 24: Recall of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_6	0.66 ± 0.3	0.37 ± 0.12	0.5 ± 0.18	0.4 ± 0.03	0.25 ± 0.08	0.27 ± 0.15
CoBaGAD loops A_6	0.9 ± 0.01	0.89 ± 0.05	0.54 ± 0.27	0.62 ± 0.2	0.26 ± 0.09	0.4 ± 0.04
GAT A_6	0.14 ± 0.02	0.34 ± 0.08	0.31 ± 0.02	0.4 ± 0.03	0.22 ± 0.07	0.16 ± 0.07
GAT loops A_6	0.55 ± 0.12	0.59 ± 0.12	0.39 ± 0.05	0.48 ± 0.1	0.27 ± 0.03	0.39 ± 0.03
GCN A_6	0.13 ± 0.02	0.12 ± 0.01	0.13 ± 0.01	0.15 ± 0.03	0.19 ± 0.01	0.11 ± 0.03
GCN loops A_6	0.38 ± 0.05	0.26 ± 0.09	0.2 ± 0.07	0.21 ± 0.01	0.32 ± 0.13	0.46 ± 0.11
GraphSAGE A_6	0.67 ± 0.04	0.58 ± 0.05	0.44 ± 0.03	0.35 ± 0.06	0.3 ± 0.08	0.64 ± 0.06
GraphSAGE loops A_6	0.65 ± 0.03	0.54 ± 0.04	0.48 ± 0.06	0.49 ± 0.16	0.48 ± 0.06	0.65 ± 0.14

Table 25: Precision of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_6	0.68 ± 0.04	0.91 ± 0.01	0.91 ± 0.03	0.78 ± 0.05	0.76 ± 0.03	0.72 ± 0.19
CoBaGAD loops A_6	1.0 ± 0.0	1.0 ± 0.0	0.99 ± 0.02	0.98 ± 0.03	0.69 ± 0.08	0.98 ± 0.01
GAT A_6	0.62 ± 0.02	0.92 ± 0.02	0.89 ± 0.03	0.89 ± 0.05	0.8 ± 0.0	0.61 ± 0.21
GAT loops A_6	1.0 ± 0.0	0.99 ± 0.02	0.99 ± 0.01	1.0 ± 0.0	0.76 ± 0.08	0.99 ± 0.01
GCN A_6	0.52 ± 0.01	0.83 ± 0.01	0.79 ± 0.03	0.83 ± 0.08	0.82 ± 0.08	0.54 ± 0.12
GCN loops A_6	0.86 ± 0.02	0.95 ± 0.06	0.86 ± 0.06	0.89 ± 0.0	0.87 ± 0.11	0.87 ± 0.02
GraphSAGE A_6	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.96 ± 0.06	0.99 ± 0.01
GraphSAGE loops A_6	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 26: Recall of the anomalies in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_6	0.98 ± 0.0	0.99 ± 0.0	0.99 ± 0.0	0.99 ± 0.0	0.98 ± 0.0	0.97 ± 0.0
CoBaGAD loops A_6	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.01	1.0 ± 0.0
GAT A_6	0.97 ± 0.0	0.99 ± 0.0	0.99 ± 0.0	0.99 ± 0.0	0.98 ± 0.0	0.96 ± 0.0
GAT loops A_6	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	0.98 ± 0.01	1.0 ± 0.0
GCN A_6	0.96 ± 0.0	0.98 ± 0.0	0.98 ± 0.0	0.98 ± 0.01	0.99 ± 0.01	0.96 ± 0.01
GCN loops A_6	0.99 ± 0.0	1.0 ± 0.01	0.99 ± 0.01	0.99 ± 0.0	0.99 ± 0.01	0.99 ± 0.0
GraphSAGE A_6	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.01	1.0 ± 0.0
GraphSAGE loops A_6	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Table 27: Precision of the normal nodes in the testing set.

Anomalies / Graph	G_0	G_1	G_2	G_3	G_4	G_5
CoBaGAD A_6	0.95 ± 0.06	0.89 ± 0.04	0.93 ± 0.04	0.93 ± 0.01	0.84 ± 0.06	0.64 ± 0.42
CoBaGAD loops A_6	0.99 ± 0.0	0.99 ± 0.0	0.92 ± 0.06	0.95 ± 0.03	0.86 ± 0.04	0.91 ± 0.01
GAT A_6	0.76 ± 0.03	0.88 ± 0.04	0.88 ± 0.01	0.92 ± 0.01	0.79 ± 0.09	0.64 ± 0.36
GAT loops A_6	0.94 ± 0.03	0.95 ± 0.02	0.9 ± 0.02	0.93 ± 0.03	0.87 ± 0.01	0.9 ± 0.01
GCN A_6	0.77 ± 0.03	0.6 ± 0.03	0.67 ± 0.03	0.68 ± 0.09	0.77 ± 0.01	0.68 ± 0.16
GCN loops A_6	0.91 ± 0.02	0.79 ± 0.1	0.76 ± 0.09	0.79 ± 0.02	0.85 ± 0.08	0.93 ± 0.03
GraphSAGE A_6	0.97 ± 0.01	0.95 ± 0.01	0.92 ± 0.01	0.88 ± 0.03	0.85 ± 0.05	0.96 ± 0.01
GraphSAGE loops A_6	0.97 ± 0.0	0.94 ± 0.01	0.93 ± 0.02	0.92 ± 0.04	0.93 ± 0.02	0.96 ± 0.03

Table 28: Recall of the normal nodes in the testing set.