Supplementary Material
EGAD: Evolving Graph Representation Learning with Self-Attention and Knowledge Distillation for Live Video Streaming Events

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Table 1. Effect on RMSE when varying the representation size d of the examined models for LiveStream-4K. We report average RMSE over the graph snapshots during the live video streaming event. Bold values denote the best configuration for each examined model.

Representation size d	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
16	0.23 ± 0.14	0.27 ± 0.09	0.18 ± 0.07	0.28 ± 0.14	0.27 ± 0.15	0.17 ± 0.09	**0.13 ± 0.09**
32	0.21 ± 0.12	**0.25 ± 0.12**	0.16 ± 0.10	0.26 ± 0.13	**0.23 ± 0.17**	0.16 ± 0.05	0.15 ± 0.10
64	**0.19 ± 0.13**	0.26 ± 0.18	**0.15 ± 0.09**	**0.25 ± 0.16**	0.24 ± 0.12	**0.14 ± 0.08**	0.16 ± 0.06
128	0.20 ± 0.17	0.26 ± 0.12	0.17 ± 0.08	0.26 ± 0.17	0.25 ± 0.16	0.15 ± 0.06	0.16 ± 0.08
256	0.21 ± 0.15	0.27 ± 0.15	0.18 ± 0.05	0.27 ± 0.19	0.26 ± 0.14	0.16 ± 0.07	0.17 ± 0.06

Table 2. Effect on RMSE when varying the representation size d of the examined models for LiveStream-6K

Representation size d	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
16	0.48 ± 0.16	0.47 ± 0.12	0.41 ± 0.15	0.48 ± 0.18	0.48 ± 0.14	0.41 ± 0.12	**0.36 ± 0.06**
32	0.46 ± 0.16	**0.44 ± 0.11**	0.40 ± 0.17	0.47 ± 0.18	**0.41 ± 0.12**	0.39 ± 0.09	0.37 ± 0.09
64	**0.45 ± 0.18**	0.45 ± 0.13	**0.39 ± 0.18**	**0.43 ± 0.16**	0.43 ± 0.15	**0.37 ± 0.10**	0.39 ± 0.10
128	0.46 ± 0.17	0.45 ± 0.14	0.41 ± 0.16	0.45 ± 0.14	0.44 ± 0.16	0.38 ± 0.11	0.40 ± 0.08
256	0.46 ± 0.18	0.46 ± 0.18	0.42 ± 0.14	0.46 ± 0.12	0.46 ± 0.18	0.38 ± 0.11	0.42 ± 0.07

Table 3. Effect on RMSE when varying the representation size d of the examined models for LiveStream-16K

Representation size d	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
16	0.36 ± 0.13	0.35 ± 0.18	0.29 ± 0.16	0.39 ± 0.15	0.39 ± 0.12	0.27 ± 0.10	**0.23 ± 0.07**
32	0.35 ± 0.14	**0.33 ± 0.19**	0.29 ± 0.14	0.37 ± 0.14	0.36 ± 0.11	0.26 ± 0.09	0.25 ± 0.09
64	**0.33 ± 0.12**	0.34 ± 0.11	**0.27 ± 0.14**	0.36 ± 0.15	**0.33 ± 0.11**	**0.24 ± 0.09**	0.26 ± 0.06
128	0.34 ± 0.11	0.35 ± 0.13	0.28 ± 0.13	**0.35 ± 0.12**	0.35 ± 0.15	0.25 ± 0.10	0.26 ± 0.08
256	0.34 ± 0.17	0.36 ± 0.11	0.29 ± 0.12	0.38 ± 0.13	0.36 ± 0.18	0.26 ± 0.10	0.27 ± 0.10

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Table 4. Impact of the window size l on the performance of each examined model in terms of RMSE for LiveStream-4K

Window size l	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
1	0.32 ± 0.16	0.35 ± 0.19	0.21 ± 0.12	N/A	N/A	0.18 ± 0.06	0.16 ± 0.05
2	**0.19 ± 0.13**	**0.25 ± 0.12**	**0.15 ± 0.09**	N/A	N/A	0.16 ± 0.09	0.14 ± 0.06
3	0.24 ± 0.18	0.28 ± 0.14	0.19 ± 0.14	N/A	N/A	**0.14 ± 0.08**	**0.13 ± 0.09**
4	0.29 ± 0.12	0.32 ± 0.16	0.20 ± 0.12	N/A	N/A	0.17 ± 0.10	0.16 ± 0.04
5	0.36 ± 0.17	0.42 ± 0.19	0.24 ± 0.14	N/A	N/A	0.20 ± 0.09	0.19 ± 0.06

Table 5. Impact of the window size l on the performance of each examined model in terms of RMSE for LiveStream-6K

Window size l	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
1	0.48 ± 0.16	0.56 ± 0.11	0.42 ± 0.14	N/A	N/A	0.41 ± 0.11	0.39 ± 0.07
2	**0.45 ± 0.18**	**0.44 ± 0.11**	**0.39 ± 0.18**	N/A	N/A	0.38 ± 0.08	0.37 ± 0.09
3	0.46 ± 0.14	0.49 ± 0.13	0.41 ± 0.16	N/A	N/A	**0.37 ± 0.10**	**0.36 ± 0.06**
4	0.52 ± 0.19	0.51 ± 0.12	0.43 ± 0.12	N/A	N/A	0.40 ± 0.09	0.39 ± 0.04
5	0.54 ± 0.12	0.54 ± 0.18	0.49 ± 0.15	N/A	N/A	0.43 ± 0.12	0.40 ± 0.05

Table 6. Impact of the window size l on the performance of each examined model in terms of RMSE for LiveStream-16K

Window size l	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
1	0.42 ± 0.12	0.38 ± 0.16	0.33 ± 0.16	N/A	N/A	0.31 ± 0.10	0.29 ± 0.06
2	**0.33 ± 0.12**	**0.33 ± 0.19**	**0.27 ± 0.14**	N/A	N/A	0.29 ± 0.11	0.27 ± 0.08
3	0.37 ± 0.11	0.36 ± 0.17	0.29 ± 0.12	N/A	N/A	**0.24 ± 0.09**	**0.23 ± 0.07**
4	0.39 ± 0.18	0.39 ± 0.19	0.31 ± 0.16	N/A	N/A	0.30 ± 0.07	0.29 ± 0.09
5	0.46 ± 0.14	0.41 ± 0.15	0.39 ± 0.14	N/A	N/A	0.38 ± 0.10	0.24 ± 0.10

Table 7. Effect on RMSE when varying the number of heads h of the self-attention mechanisms of DySAT, EGAD-$\mathcal{T}$ and EGAD-$\mathcal{S}$ for LiveStream-4K

Number of heads h	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
1	N/A	N/A	0.19 ± 0.06	N/A	N/A	0.16 ± 0.05	**0.13 ± 0.09**
2	N/A	N/A	0.17 ± 0.07	N/A	N/A	0.15 ± 0.04	0.14 ± 0.10
3	N/A	N/A	**0.15 ± 0.09**	N/A	N/A	**0.14 ± 0.08**	0.16 ± 0.08
4	N/A	N/A	0.16 ± 0.08	N/A	N/A	0.16 ± 0.07	0.17 ± 0.09
5	N/A	N/A	0.18 ± 0.08	N/A	N/A	0.17 ± 0.09	0.20 ± 0.03

Table 8. Effect on RMSE when varying the number of heads h of the self-attention mechanisms of DySAT, EGAD-$\mathcal{T}$ and EGAD-$\mathcal{S}$ for LiveStream-6K.

Number of heads h	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
1	N/A	N/A	0.47 ± 0.12	N/A	N/A	0.42 ± 0.07	**0.36 ± 0.06**
2	N/A	N/A	0.45 ± 0.15	N/A	N/A	0.40 ± 0.12	0.38 ± 0.06
3	N/A	N/A	**0.39 ± 0.18**	N/A	N/A	**0.37 ± 0.10**	0.41 ± 0.04
4	N/A	N/A	0.41 ± 0.14	N/A	N/A	0.38 ± 0.10	0.43 ± 0.09
5	N/A	N/A	0.46 ± 0.17	N/A	N/A	0.39 ± 0.11	0.43 ± 0.08

Table 9. Effect on RMSE when varying the number of heads h of the self-attention mechanisms of DySAT, EGAD-$\mathcal{T}$ and EGAD-$\mathcal{S}$ for LiveStream-16K

Number of heads h	**DynVGAE**	**EvolveGCN**	**DySAT**	**DMTKG-$\mathcal{T}$**	**DMTKG-$\mathcal{S}$**	**EGAD-$\mathcal{T}$**	**EGAD-$\mathcal{S}$**
1	N/A	N/A	0.32 ± 0.17	N/A	N/A	0.28 ± 0.08	**0.23 ± 0.07**
2	N/A	N/A	0.29 ± 0.18	N/A	N/A	0.26 ± 0.10	0.25 ± 0.05
3	N/A	N/A	0.28 ± 0.15	N/A	N/A	**0.24 ± 0.09**	0.26 ± 0.09
4	N/A	N/A	**0.27 ± 0.14**	N/A	N/A	0.25 ± 0.06	0.26 ± 0.10
5	N/A	N/A	0.29 ± 0.12	N/A	N/A	0.27 ± 0.07	0.27 ± 0.08