Multi-Scale Diffusion Results

1 Step 1 Results Summary

Dataset	Best NMI	Best Epoch	Training Time	Best Method	NMI Improvement	ACC Improvement
Cora	0.5847	40	21.56s	Heat	+0.0153	+0.0137
CiteSeer	0.3587	10	57.41s	PPR	+0.0210	+0.0460
PubMed	0.2960	10	333.98s	PPR	+0.0211	+0.0131

2 Detailed Performance Comparison

2.1 Cora Dataset

Method	NMI	ACC	F1	ARI
Original (AX + SX)	0.5694	0.7283	0.7093	0.5316
Enhanced PPR	0.5670	**0.7422**	0.7227	0.5453
Enhanced Heat	**0.5847**	0.7420	**0.7230**	**0.5491**

2.2 CiteSeer Dataset

Method	NMI	ACC	F1	ARI
Original (AX + SX)	0.3377	0.6388	0.6252	0.4238
Enhanced PPR	**0.3587**	**0.6848**	**0.6632**	**0.4676**
Enhanced Heat	0.3384	0.6403	0.6267	0.4253

2.3 PubMed Dataset

Method	NMI	ACC	F1	ARI
Original (AX + SX)	0.2749	0.6981	0.6892	0.3189
Enhanced PPR	**0.2960**	**0.7112**	**0.7023**	**0.3320**
Enhanced Heat	0.2913	0.7089	0.7000	0.3297

3 Component Performance Statistics

3.1 Cora

Component	Total Time (s)	Avg Time (s)	Total Memory (MB)	Avg Memory (MB)	Calls
Encoder	2.253	0.005	20.7	0.0	450
Random Walk	0.084	0.000	1.0	0.0	900
Embeddings	0.049	0.005	0.0	0.0	10
Loss	1.954	0.004	54.2	0.1	450
K-means	0.377	0.054	1.5	0.2	7
Preprocessing	0.069	0.017	104.6	26.2	4

3.2 CiteSeer

Component	Total Time (s)	Avg Time (s)	Total Memory (MB)	Avg Memory (MB)	Calls
Encoder	12.233	0.023	5.7	0.0	525
Random Walk	0.155	0.000	0.0	0.0	1050
Embeddings	0.234	0.023	51.7	5.2	10
Loss	5.335	0.010	30.7	0.1	525
K-means	0.502	0.072	1.8	0.3	7
Preprocessing	0.201	0.050	330.1	82.5	4

3.3 PubMed

Component	Total Time (s)	Avg Time (s)	Total Memory (MB)	Avg Memory (MB)	Calls
Encoder	57.164	0.019	41.6	0.0	3000
Random Walk	0.537	0.000	3.8	0.0	6000
Embeddings	0.359	0.036	250.3	25.0	10
Loss	32.075	0.011	129.2	0.0	3000
K-means	0.406	0.058	2.2	0.3	7
Preprocessing	0.221	0.055	266.8	66.7	4