Supplementary File

Graph Neural Networks in Alzheimer's Disease Diagnosis: A Review of Unimodal and Multimodal Advances

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1 SUPPLEMENTARY DATA

Table S1. GitHub Repositories for Open-Source Code in Reviewed Studies

Reference	GitHub Repository
Parisot et al. (2018)	https://github.com/parisots/population-gcn
Ktena et al. (2018)	https://github.com/sk1712/gcn_metric_learning
Jiang et al. (2020)	https://github.com/haojiang1/hi-GCN
Song et al. (2021)	https://github.com/SJTUBME-QianLab/AutoMetricGNN
Kim et al. (2021)	https://github.com/JaesikKim/temporal-GNN
Yao et al. (2021)	https://github.com/Brain03Yao/MMTGCN
Wen et al. (2022)	https://github.com/GuangqiWen/MVS-GCN
Song et al. (2022)	https://github.com/Xuegang-S
Zheng et al. (2022)	https://github.com/SsGood/MMGL
Li et al. (2022a)	https://github.com/llt1836/TE-HI-GCN
McCombe et al. (2022)	https://github.com/mac-n/Clustering-GNN
Qu et al. (2023)	https://github.com/Zongshuaiqu/UNB-GCN
Hao et al. (2024)	https://github.com/bob-lee-student/WHGCN
Tekkesinoglu and Pudas (2024)	https://github.com/suletekkesinoglu/GCN_XAI_ADNI

Note: Only studies with publicly available code on GitHub are listed (accessed on 18 August 2025).

Table S2: Distribution of Studies and Performance Metrics by GNN Architecture and Task.

GNN Architecture	NC vs. AD	NC vs. MCI	MCI vs. AD	References
a) Performance of GNN Architectures in Unimodal Studies				
Spectral-ChebNet	$89.17\pm2.44_{[85.80\text{-}91.51]}$	$71.12\pm14.63_{[51.80\text{-}93.00]}$	$80.50\pm1.30_{[79.20\text{-}81.80]}$	Wee et al. (2019); Ktena et al. (2018); Kumar et al. (2022); Zuo and Kamata (2023); Guo et al. (2019)
Spectral-GCN	$86.58\pm6.87_{[71.30\text{-}96.18]}$	$76.68\pm5.54_{[73.37\text{-}88.90]}$	$75.77\pm12.69_{[53.50\text{-}94.70]}$	Kim et al. (2021); Zhu et al. (2021); Peng et al. (2022); Zhang et al. (2023a); Aafiya and Jeyachidra (2024); Liu et al. (2024); Hao et al. (2024); Liu et al. (2020b); Gu et al. (2021); Lee et al. (2021); Tang et al. (2022); Mei et al. (2022); Wen et al. (2022); Qin et al. (2022); Liu et al. (2023b,c); Song et al. (2019); Klepl et al. (2022)
Spectral-Other	$86.20\pm0.00_{[86.20\text{-}86.20]}$	$75.27\pm10.23_{[63.90\text{-}93.50]}$	—	Fan et al. (2023); Zhao et al. (2019); Li et al. (2023c); Cai et al. (2023)
Spatial-GIN	$90.44\pm0.00_{[90.44\text{-}90.44]}$	—	—	Wang et al. (2023b)
Spatial-Other	$79.83\pm9.22_{[67.22\text{-}89.00]}$	—	—	Fan et al. (2022)
ST-RNN	$80.23\pm6.66_{[72.70\text{-}88.90]}$	$78.60\pm0.00_{[78.60\text{-}78.60]}$	—	Liu et al. (2023a)
ST-CNN	$91.10\pm0.00_{[91.10\text{-}91.10]}$	—	—	Shan et al. (2022)
ST-Other	$99.16\pm0.00_{[99.16\text{-}99.16]}$	—	—	Wang et al. (2023a)

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Table S2 (continued)

GNN Architecture	NC vs. AD	NC vs. MCI	MCI vs. AD	References
MultiGraph-GCN	—	$86.75\pm3.35_{[83.40\text{-}90.10]}$	—	Yao et al. (2021); Cui et al. (2023)

b) Performance of GNN Architectures in Multimodal Studies

GNN Architecture	NC vs. AD	NC vs. MCI	MCI vs. AD	References
Spectral-ChebNet	$95.44\pm1.18_{[93.88\text{-}96.94]}$	$83.89\pm3.12_{[80.00\text{-}88.18]}$	$83.33\pm0.00_{[83.33\text{-}83.33]}$	Parisot et al. (2018); Zhu et al. (2021); Kazi et al. (2019b,a); Huang and Chung (2020); Zhang et al. (2023c,b)
Spectral-GCN	$89.49\pm7.58_{[77.20\text{-}99.30]}$	$91.29\pm3.86_{[84.10\text{-}98.00]}$	$86.41\pm5.81_{[78.50\text{-}94.60]}$	Kim (2023); Yu et al. (2019); Jiang et al. (2020); Subaramya et al. (2022); Lin et al. (2023); Li et al. (2023a); McCombe et al. (2022); Song et al. (2022); Liu et al. (2020a); Qu et al. (2023); Tekkesinoglu and Pudas (2024); Zhou et al. (2022a,b); Zhang et al. (2023d)
Spectral-Other	$94.84\pm1.23_{[93.61\text{-}96.06]}$	$89.62\pm7.91_{[76.78\text{-}98.25]}$	$89.73\pm5.56_{[82.09\text{-}95.15]}$	Bi et al. (2023); Salim and Hamza (2024); Meng and Zhang (2023); Li et al. (2022b); Zhang et al. (2022)
Spatial-GraphSAGE	$93.72\pm5.01_{[88.71\text{-}98.72]}$	$88.50\pm6.13_{[79.68\text{-}95.83]}$	$86.33\pm3.63_{[82.70\text{-}89.96]}$	Song et al. (2021); Zheng et al. (2022); Tian et al. (2023); Chen et al. (2024)
Spatial-GAT	$96.00\pm0.00_{[96.00\text{-}96.00]}$	—	—	Choi et al. (2022)
Spatial-Other	$92.55\pm4.55_{[88.00\text{-}97.10]}$	$92.20\pm5.00_{[87.21\text{-}97.20]}$	$92.40\pm0.00_{[92.40\text{-}92.40]}$	Yang et al. (2023); Li et al. (2023b)
ST-RNN	—	$85.06\pm5.34_{[79.73\text{-}90.40]}$	$86.70\pm0.00_{[86.70\text{-}86.70]}$	Li et al. (2022a); Yang et al. (2022); Xing et al. (2019)
ST-Other	$93.50\pm0.00_{[93.50\text{-}93.50]}$	—	—	Chhabra et al. (2023)
MultiGraph-GCN	—	$87.89\pm3.94_{[84.80\text{-}93.46]}$	—	Lei et al. (2023); Guo et al. (2023)

Note. Values are reported as mean±SD$_{[\text{range}]}$
NC vs. MCI accuracies were aggregated from tasks such as NC/MCI, NC/EMCI, and NC/LMCI. Similarly, MCI vs. AD accuracies were summarized from tasks including EMCI/AD, MCI/AD, and LMCI/AD.

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