Legend: Labeled Nodes · Pseudo-Labeled Nodes · Unlabeled Nodes · — — Added Edge · ▨ Mixup

(a) Pseudo Labeling — Input Graph (A X) → Pseudo Labeling → Pseudo-Labeled Graph

(b) Intra-class Mixup — Feat. + Labels + Adj Mixup → $\tilde{A}, D_{intra} = \{\tilde{X}_1, \tilde{Y}_1\}$

(c) Inter-class Mixup — Feat. + Labels Mixup → $E, D_{inter} = \{\tilde{X}_2, \tilde{Y}_2\}$

(d) Overall Framework of NodeMixup — Intra-class Mixup → $\tilde{A}\ \tilde{X}_1\ \tilde{Y}_1$ → GNN → Inter-class Mixup Loss; $A\ X\ Y$ → GNN → GNN Loss; Inter-class Mixup → $E\ \tilde{X}_2\ \tilde{Y}_2$ → GNN → Intra-class Mixup Loss; Update / Pseudo Labels

E Identity Matrix $\tilde{X}_1/\tilde{X}_2$ Mixed Feat. D_{intra} Intra-class Data Set

$\tilde{A}$ Mixed Adj $\tilde{Y}_1/\tilde{Y}_2$ Mixed Labels D_{inter} Inter-class Data Set