TrackOpt GNN update

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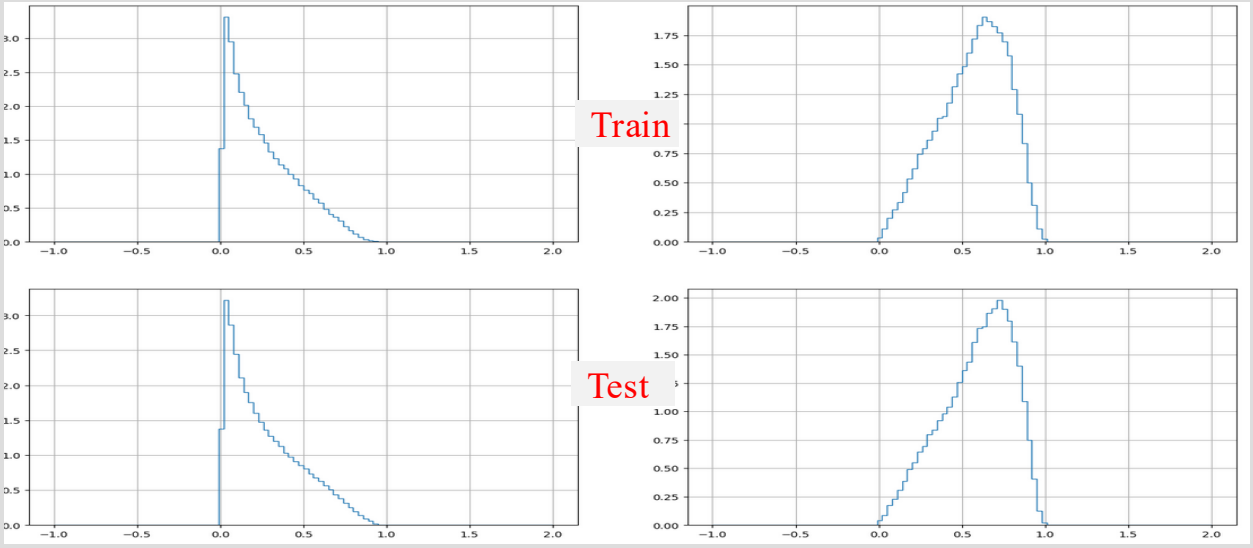
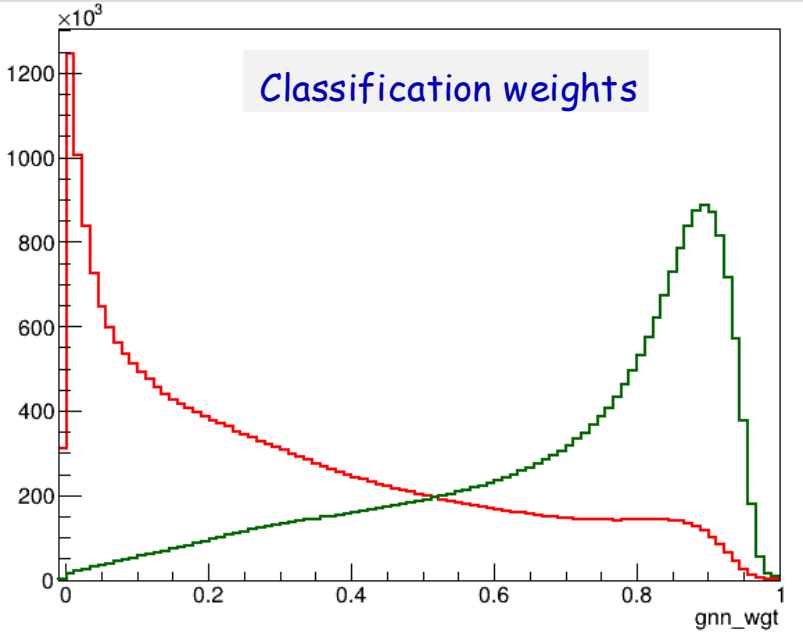
Previous DGL result - wrong

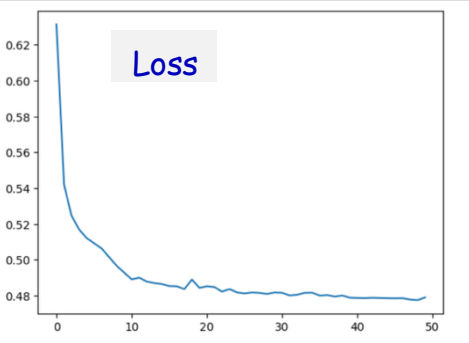


AUC(train)= 0.8265. AUC(test)= 0.8294 for primary+secondary edges. AUC(SVonly)=0.848

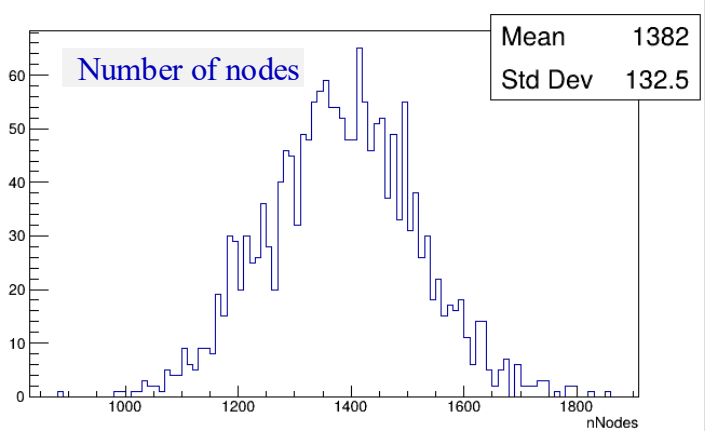
Error in trained GNN result extraction discovered

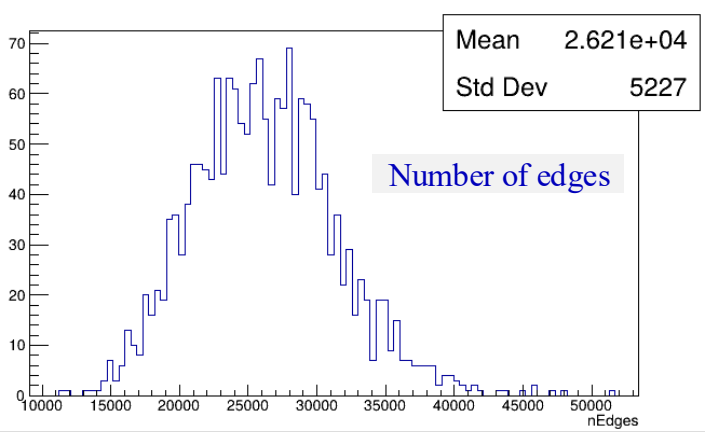
Corrected LLP sample results





AUC(PV)= 0.84
AUC(SV)= 0.93





Corrected LLP results (μ=200)

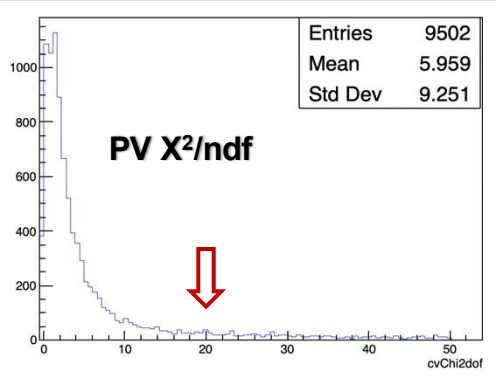
Universität Siegen

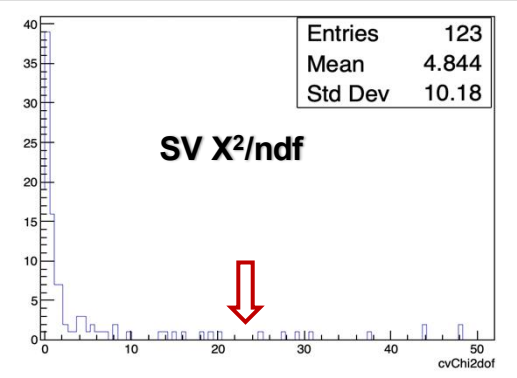
Compare LMC clustering in 2 cases

1) Edge weights are obtained in GNN processing
2) Edge weights are based on simple 2-track vertex fit χ^2

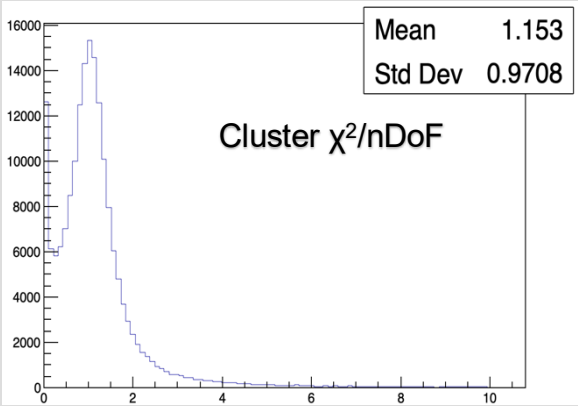
LMP weight	Ncl 1-track	Ncl N-track	effic. SV_c	purity SV_c	mixed 2trk clst	Lost sec.track	VI PV_c	ARI PV_c	VI SV_c	ARI SV_c
GNN wgt	230	100	43%	89%	1.4	20%	1.25	0.756	0.522	0.576
Truth	98	116	100%	100%	0	0	0	1	0	1
Edge Chi2	197	81	6%	43%	1.6	69%	4.40	0.153	1.89	0.095

Initial erroneous result …





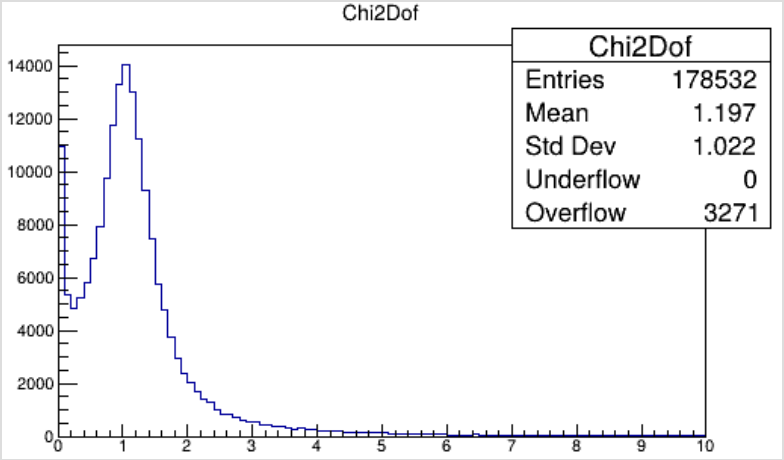
Corrected

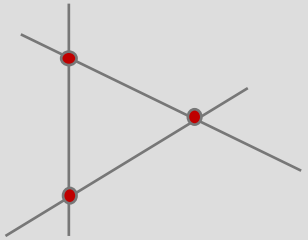


Next steps

1) Try hyper-edges to resolve triangular anomaly (still ~2% cases)

HO LMC code is available.





This is not a 3-track SV!

2) Try simultaneous GNN edge+node classification for better efficiency.

"Joint Graph Decomposition and Node Labeling: Problem, Algorithms, Applications"

arXiv:1611.04399

Is there a code from this paper?