Leveraging Physics-informed GNN for enhanced Combinatorial Optimization

loc. 17

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GRAPH COLORING
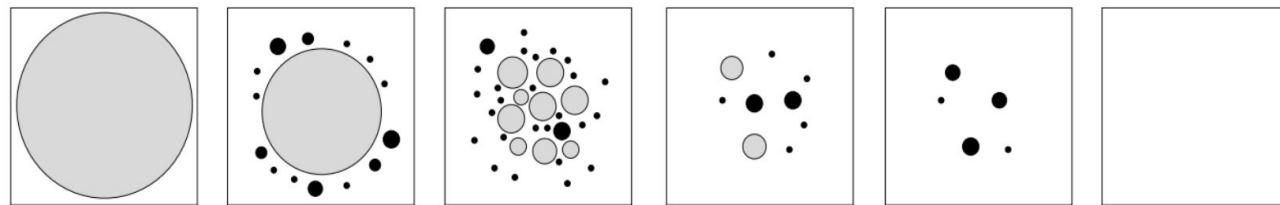

UNCOLORED GRAPH → COLORED GRAPH

q colors
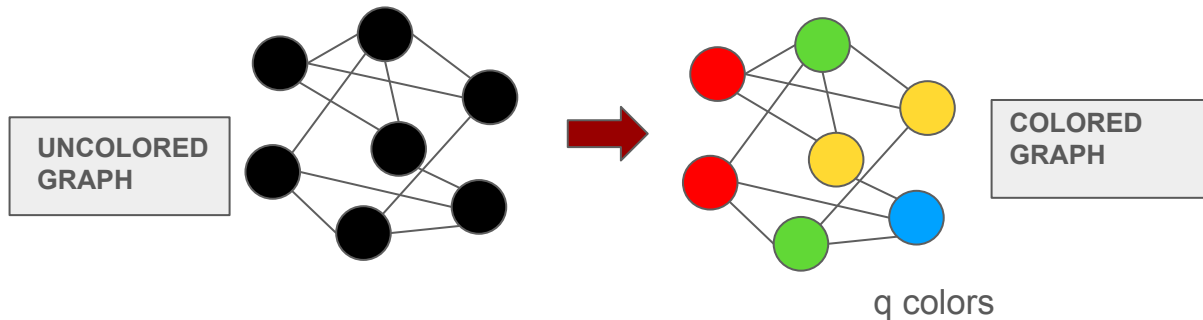
- NP-Hard problem
- Numerous applications (eg. scheduling, register allocation)
- Can be studied using statistical mechanics.

$$\mathcal{H} = \sum_{(i,j)\in E} \delta_{\sigma_i \sigma_j}$$
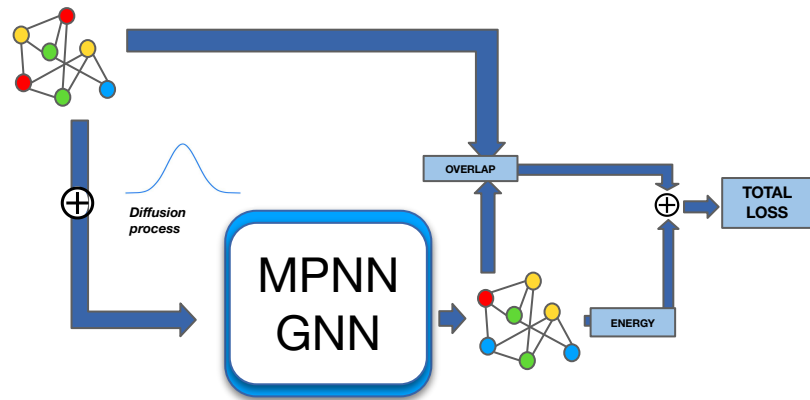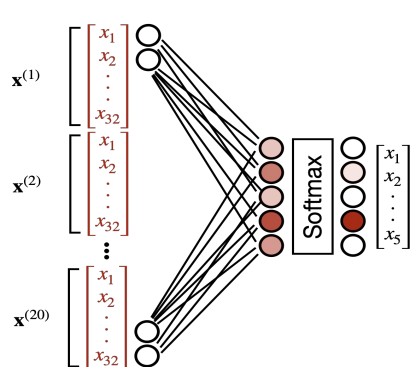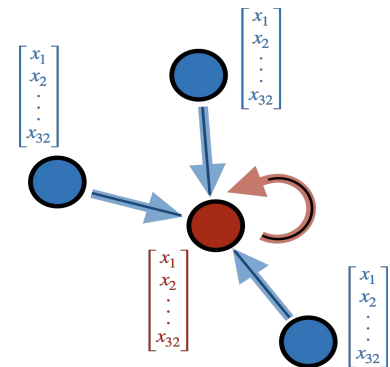

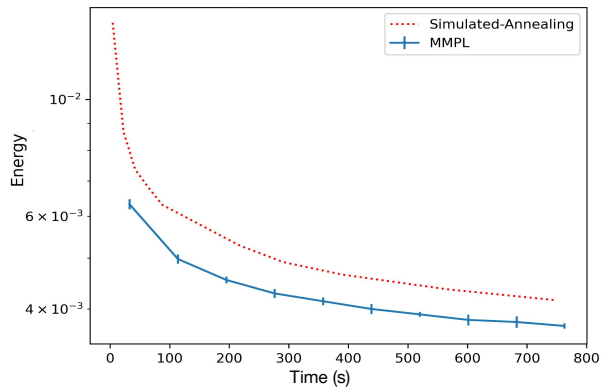Average connectivity   Clustering c_d Condensation c_c Rigidity c_r COL/UNCOL c_s

PI-GNN

Preliminary results

Energy vs time (N=10e5, c=14.0)

Energy vs Connectivity (N=2e5)