Random Lifts of Graphs

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ABSTRACT
In the talk we present several results on random lifts of graphs, a random graph model defined by Amit and Linial\([1]\).

For graphs \(G\) and \(H\), a map \(\pi : V(H) \rightarrow V(G)\) is a covering map from \(H\) to \(G\) if for every \(v \in V(H)\) the restriction of \(\pi\) to the neighbourhood of \(v\) is a bijection onto the neighbourhood of \(\pi(v) \in V(G)\). If such a mapping exists, we say that \(H\) is a lift of \(G\). Moreover, if the number of vertices of \(H\) mapped to a vertex \(V\) of the base graph \(G\) is \(n\) for all vertices \(v \in G\), we say that \(H\) is an \(n\)-lift of \(G\). The set of all \(n\)-lifts of \(G\) we denote as \(L_n(G)\).

The random \(n\)-lift of a graph \(G\) is obtained by choosing uniformly at random one graph from the set \(L_n(G)\). Equivalently, the random \(n\)-lift of \(G\) can be generated by choosing independently and uniformly at random for every edge \(\{u, v\} \in E(G)\) a perfect matching between the set of \(n\) vertices that are mapped to \(u\) and the set on \(n\) vertices mapped to \(v\).

In this talk we briefly survey some basic properties of random lifts and its applications.

References


