

CS 703 Progress Report

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1 Project selection

The term project is finally settled to be synthesis by examples with a focus on studying the expected size of the maximum clique in a graph following some random distributions. The ultimate goal is to find some probabilistic graph models on which the synthesis by examples works practically. We will also conduct experiments on different graph models to evaluate their performance as in the number of consistent programs they missed and the expected search space size.

2 Current progress

The current work involves reviewing existing literatures on graph models [1, 3] and the history of this problem [4, 5, 2]. The current focus is to implement the Power Law Graph generator in addition to the Erdős-Rényi graph generator which has already been implemented.

The methods to compute maximal disjoint cliques and maximum clique are also implemented. The former so far is a trivial greedy algorithm while the latter employs enumeration. Note that finding the maximum clique in a graph is NP-complete, and hence this step is the bottleneck for the running time.

The undergoing proposal will comprise a detailed definition of the problem after the literature review, and specific deliverables will also be outlined.

References

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- [3] David Easley and Jon Kleinberg. *Networks, crowds, and markets: Reasoning about a highly connected world*. Cambridge University Press, 2010.
- [4] Sumit Gulwani, William R Harris, and Rishabh Singh. Spreadsheet data manipulation using examples. *Communications of the ACM*, 55(8):97–105, 2012.
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