Some Problems In Graph Coloring

By: Payam Valadkhan
Faculty Member, School of Computer Science, IPM

Abstract

This talk is about algorithmic problems related to graph coloring which come from different applications. I introduce some research projects related to our ongoing papers. Some examples:

Q: We need to find some efficient algorithms (preferable linear and on-line) to color a random graph G which is related to video-streaming. The graph is defined as follows: let U be a set of users and F be a set of files. Each user has stored each file with probability $0 < q < 1$ independent of other users and files (where q is a constant.) The graph G has n vertices with each vertex being a pair $(u, f) \in U \times F$ with this condition that the user u has NOT stored the file f. We connect two distinct vertices (u, f) and (u', f') if and only if u has not stored f' or u' has not stored f.

Q: In another work, we are dealing with special types of graph coloring. To show the coloring rules we use the notion of *trigraph*, which is similar to graph, except that in addition to ordinary edges we have *double-edges* as well. We need to identify (=finding good necessary and/or sufficient conditions for) certain types of trigraphs, as well as finding polynomial time algorithm to color general graphs using the rules expressed by these trigraphs.

These open problems are posted on my webpage (http://payam-research.atwebpages.com/) with more to come in future.

*** شرکت برای عموم علاقه مندان آزاد است***