Identifying coloring of a graph

Li-Da Tong

(joint work with Ting-Pang Chang)

Let $G$ be a graph, $u$ be a vertex of $G$, and $B(u)$ (or $B_G(u)$) be the set of $u$ with all its neighbors in $G$. A set $S$ of vertices is called an identifying set of $G$ if there exists a function $f$ from $V(G)$ to the set of all nonempty subsets of $S$ such that (i) for each vertex $u$ of $G$, $f(u) \subseteq B(u)$, and (ii) for every pair of distinct vertices $u$ and $v$, $f(u)$ and $f(v)$ are distinct. $f$ is called an identifying coloring of $G$ with respect to $S$. The identifying chromatic number $\iota_c(G)$ is the cardinality of a minimum identifying set of $G$. In this paper, we study the identifying sets in graphs, give a polynomial-time algorithm to find a minimum identifying set of a tree, and determine the identifying chromatic numbers of complete bipartite graphs.

References