学术报告

Parking function

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Abstract：

The notion of a parking function was introduced by Konheim and Weiss in 1966. Suppose that there are n drivers labeled $1, 2, \cdots, n$ and n parking spaces arranged in a line numbered $1, 2, \cdots, n$. Assume that driver i has its initial parking preference $f(i)$, where $1 \leq f(i) \leq n$, and these n drivers enter the parking area in the order $1, 2, \cdots, n$ and driver i parks at space j, where j is the minimum number with $f(i) \leq j \leq n$ such that space j is unoccupied by the previous drivers. If all drivers can park successfully by this rule, then $(f(1), f(2), \cdots, f(n))$ is called a *parking function* of length n.

In 2004, Postnikov and Shapiro extended parking functions to G-parking functions for connected multigraphs $G = (V, E)$ without loops. For a fixed vertex x_0 in G, a function $f : V - \{x_0\} \to \{0, 1, 2, 3, \cdots\}$ is called a *G-parking function* with respect to x_0 if for any non-empty subset $V' \subseteq V - \{x_0\}$, there exists $u \in V'$ with $|E_G(u, V - V')| > f(u)$. The most interesting property on G-parking functions is the existence of bijections from the set of spanning trees of G to the set of G-parking functions with respect to a fixed vertex x_0.

A matching M in a graph G is said to be *uniquely restricted* if M is the only perfect matching in the subgraph of G induced by vertices saturated by M. We extend the concept of G-parking functions of connected graphs to B-parking functions $f : X \to \{-1, 0, 1, 2, 3, \cdots\}$ for any bipartite graph $H = (X, Y)$ and establish a bijection ψ from the set of uniquely restricted matchings in H to the set of B-parking functions of H.

In this talk, I will introduce some basic properties on parking functions, G-parking functions and B-parking functions and give some interpretations of these functions.

欢迎大家参加！