國立陽明交通大學應用數學系 學術演講公告

主講人:蔡詩妤博士(中央研究院資訊科學研究所)

講題: Obtaining Approximately Optimal and Diverse Solutions via Dispersion

時 間:113年3月26日(星期二)下午14:00-15:00 地 點:(光復校區)科學一館223室

Abstract

We study diverse solutions to optimization problems and design fair scheduling of demands with different priorities on wireless networks The problem of finding several sufficiently-diverse, yet approximately-optimal solutions to an optimization problem can be described as follows: given an integer k, an approximation factor \$\alpha\$, and a diversity measure \$\sigma\$ on a set of solutions to an optimization problem P, find a set of k solutions to P that (a) are all \$\alpha\$ approximately-optimal for P and (b) maximize the diversity measure \$\sigma\$ over all such sets of k solutions. The optimization problems considered here are maximum matching, spanning tree, global min-cut, shortest path, and minimum weight bases of a matroid. Here, a solution is a set of edges, and the number of edges two given solutions differ in as the diversity measure of the pair. The diversity measure \$\sigma\$ of k solutions is the sum of the pairwise Hamming distance between the bit-vectors representing the k solutions. We propose the first polynomial-time algorithms that (except for the unweighted spanning tree), for these five graph problems, guarantee that their diversity is at least 1/4 times the optimal diversity under different \$\alpha\$.

This result is applied for minimum weight bases of a matroid, which means it gives us diverse \$\alpha\$-approximate minimum spanning trees, advancing a step towards achieving diverse \$\alpha\$-approximate TSP tours.

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