Abstract:

Delta-matroids, introduced by Bouchet, are combinatorial objects capturing combinatorial properties of skew-symmetric or symmetric matrices. For an abelian group Γ, a Γ-labelled graph is a graph whose vertices are labelled by elements of Γ. We prove that a certain collection of edge sets of a Γ-labelled graph forms a delta-matroid, which we call a Γ-graphic delta-matroid, and provide a polynomial-time algorithm to solve the separation problem, which allows us to apply the symmetric greedy algorithm of Bouchet to find a maximum weight feasible set in such a delta-matroid. We present two algorithmic applications on graphs; Maximum Weight Packing of Trees of Order Not Divisible by k and Maximum Weight S-Tree Packing.

This is joint work with Duksang Lee.