# Lifting Cover Inequalities for the Precedence-Constrained Knapsack Problem

박 경 철 박 성 수

한국과학기술원 산업공학과

**ABSTRACT**

We consider the polyhedral structure of the precedence-constrained knapsack problem, which is a knapsack problem with precedence constraints imposed on the set of variables. The problem itself appears in many applications. Moreover, since the precedence constraints appear in many important integer programming problems, the polyhedral results can be used to develop cutting-plane algorithms for more general applications. We present a modification of the cover inequality and lifting procedures of the modified cover inequality, which explicitly consider the precedence constraints. Some properties of the lifted inequality are analyzed and the problem of finding an optimal order of lifting is also addressed.