On Online Resource Leasing

Abstract

We consider online optimization problems in which certain resources have to be acquired in order to provide a service or infrastructure. Classically, decisions for such problems are considered as final: one *buys* the resources. However, in many real world applications, there is a shift away from the idea of *buying* resources. Instead, *leasing* is often more flexible and is rapidly becoming not only an alternative but a predominant business model in many markets. Research has realized this shift and recently initiated the theoretical study of leasing models.

Meyerson [FOCS '05] introduced the first leasing model with the Parking Permit Problem. Here, each day, we either use the car if it is raining or we walk if it is sunny. If we use the car, we must have a valid parking permit. There are K different types of parking permits (leases), each with its own duration and cost. The goal is to buy a set of parking permits in order to cover all rainy days and minimize the total cost of purchases (without using weather forecasts). This simple problem captures the main concept of leasing.

In this talk, I give a snapshot of existing results partly achieved within the sub-project A1, that extend this concept to more sophisticated optimization problems. I also present our plans in the A1 sub-project following this series of results.