The Team Orienteering Arc Routing Problem

Claudia Archetti [(1)] *Ángel Corberán* [(2)]
Isaac Plana [(2)] *José M. Sanchis* [(3)] *M. Grazia Speranza* [(1)]

[(1)] *Universitá di Brescia, Italy*

[(2)] *Universitat de València, Spain*

[(3)] *Universidad Politécnica de Valencia, Spain*

The Team Orienteering Arc Routing Problem (TOARP) is the extension to the arc routing setting of the Team Orienteering Problem (TOP). In the TOARP a set of potential customers, each associated with an arc of a directed graph, is available and a profit is collected when a potential customer is served that is when the associated arc is traversed. A fleet of vehicles is available to visit the customers. Each vehicle has a given maximum traveling time. The profit of a customer can be collected by one vehicle at most. The objective is to identify the customers which maximize the total collected profit while satisfying the given time limit for each vehicle. In this talk we propose an ILP formulation for the TOARP and study its associated polyhedron. Several families of valid inequalities to strengthen its linear relaxation are presented and it is proved that some of them induce facets of the TOARP polyhedron. A branch-and-cut has been designed for the solution of the problem and some preliminary computational results on benchmark instances are shown.