# On the Chinese Postman Problem with load-dependent costs

Angel Corberán*†[1], Güneş Erdoğan[2], Gilbert Laporte[3], Isaac Plana[1], and José Maria Sanchis[4]

[1]Universidad de Valencia – Spain
[2]University of Bath – United Kingdom
[3]HEC Montréal – Canada
[4]Polytechnic University of Valencia – Spain

**Abstract**

We introduce an interesting variant of the well-known Chinese Postman Problem (CPP). While in the CPP the cost of traversing an edge is a constant (equal to its length), in the variant we present here the cost of traversing an edge depends on its length and on the weight of the vehicle at the moment it is traversed. This problem is inspired by the perspective of minimizing pollution in transportation, since the amount of pollution emitted by a vehicle not only depends on the travel distance, but also on its load, among other factors. We define the problem, study its computational complexity, provide two different formulations and propose two metaheuristics for its solution. Extensive computational experiments reveal the extraordinary difficulty of this problem.

*Speaker
†Corresponding author: angel.corberan@uv.es