CROWD-SHIPPING UNDER UNCERTAINTY

MODELS, SOLUTION APPROACHES, AND COMPENSATION ISSUES

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INSCRIPCIONES

E-commerce continues to grow all over the world. The recent pandemic caused by COVID-19 has increased this trend. Concurrently, crowd-shipping is emerging as a viable solution to fulfill last-mile deliveries, with AmazonFlex taking the lead in implementing such distribution models.

In this talk, we consider the situation of a crowd-shipping platform that must fulfill delivery requests from a central depot with a fleet of professional vehicles and a pool of crowd drivers. The supply (number) of crowd drivers is uncertain. We thus propose stochastic programming models for two variants of the problem: one in which we consider a single pool of drivers and one in which the territory served by the platform is divided into geographical sectors and drivers are characterized by their destination sector. Exact solution approaches are provided in each case.

We also examine drivers' compensation issues. We assume that drivers can accept or reject routes and that the probability of route acceptance is dependent on the compensation offered. We determine the market equilibrium when the stochastic route acceptance of crowd-drivers is considered.

Joint work with
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