SEMINAR

Equitable Routing of Capacitated Mobile Facilities

TUESDAY
June 11, 2024

START AT
3 p.m.

UNIVERSITY OF CALABRIA
Aula Seminari DESF, Cubo 0/C

Prof. Jeffrey W. Ohlmann
University of Iowa

Bio: Jeffrey W. Ohlmann is Associate Professor of Management Sciences and Huneke Research Fellow in the Tippie College of Business at the University of Iowa. His research on the modeling and solution of decision-making problems has produced more than two dozen research papers. He has collaborated with companies such as Transfreight, LeanCor, Cargill, the Hamilton County Board of Elections, and three National Football League franchises. Because of the relevance of his work to industry, he was bestowed the George B. Dantzig Dissertation Award.

ABSTRACT

We consider the task of routing a fleet of mobile facilities to parking locations at prespecified points in time where they serve stochastic customer demand. Novel features of our problem include the consideration of nonreplenishable capacity and the equitable deployment of this capacity over the problem horizon. We present a multi-period mathematical formulation with an objective of maximizing the difference between expected demand served and the travel costs of the fleet. To ensure fairness, we employ equality constraints that balance the expected service level of a mobile facility across periods. We determine a priori solutions via a sample-based variable neighborhood search heuristic employing tabu search as its base local search mechanism on the discrete routing variables and gradient descent on the continuous capacity allocation variables. For a given set of sample scenarios, we obtain upper bounds for our instances by applying sample average approximation with an exact solver to a relaxed linearization of our formulation. Based on the patterns in solutions from the computational experiments, we make general observations on the structure of mobile facility routes.

ULTRA OPTYMAL
PRIN 2020 Project

UNIVERSITÀ DELLA CALABRIA
DIPARTIMENTO DI ECONOMIA, STATISTICA E FINANZA
GIOVANNI ANANIA