

Seminars Announcement

November 8th, 2019, 10.00

Aula Seminari (ex Softel), I Floor, Ed. 3/A DIETI - Via Claudio, 21 NAPOLI



Prof. Claudia Archetti

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A dynamic and probabilistic orienteering problem

Abstract. We consider an online version of the orienteering problem, where stochastic service requests arise during a first time interval from customers located on the nodes of a graph. Every request must be accepted/rejected in real time. Later, a vehicle must visit the accepted customers during a second time interval. Each accepted request implies a prize, depending on the customer, and a service cost, depending on the routing decisions. Moreover, an accepted request implies a reduction of the routing time available for possible future requests. Each acceptance/rejection decision is made to maximize the expected profit, i.e., the difference between expected prices and expected service costs.

We derive analytical expressions for the exact computation of the optimal policy. Since an exact policy computation is intractable, we design and test several heuristic approaches, including static approximation, simple greedy (non-anticipatory) methods, Sample Average Approximation (SAA) of the objective function using Monte Carlo sampling of future events. We perform extensive computational tests on the proposed algorithms and discuss the pros and cons of the different methods on the specific problem.

Short C.V.: Since September 2019, Claudia Archetti is Associate Professor in Operations Research at ESSEC Business School in Paris. She was previously Associate Professor at the University of Brescia. She teaches courses for undergraduate, master and PhD students in OR and logistics. The main areas of the scientific activity are: models and algorithms for vehicle routing problems; mixed integer mathematical programming models for the minimization of the sum of inventory and transportation costs in logistic networks; exact and heuristic algorithms for supply-chain management; reoptimization of combinatorial optimization problems. Claudia Archetti has carried out the scientific activity in collaboration with Italian and foreign colleagues and published joint papers with some of the best researchers at the international level. She is author of more than 60 papers in international journals. She was Area Editor of Computers and Operations Research. She is Associate Editor of Transportation Science and of Networks and member of the Editorial Board of European Journal of Operational Research. Claudia Archetti is VIP3 of EURO, the Association of European Operational Research Societies, in charge of publications and communication.

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Seminars Announcement

November 8th, 2019, 12.00

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Flexible two-echelon location-routing for supply networks

Abstract. We consider an integrated routing problem in which a supplier delivers a commodity to its customers through a two-echelon supply network. Over a planning horizon, the commodity is first sent from a single depot to a set of Distribution Centers (DCs). Then, from the DCs, it is delivered to customers. Two sources of flexibility are analyzed: flexibility in network design and flexibility in due dates. The former is related to the possibility of renting any of the DCs in any period of the planning horizon, whereas the latter is related to the possibility of serving a customer between the period an order is set and a due date. The objective is to minimize the total cost consisting of the sum of the shipping cost from the depot to the DCs, the traveling cost from the DCs to the customers, the renting cost of DCs, and the penalty cost for unmet due dates. A mathematical programming formulation is presented, together with different classes of valid inequalities. Moreover, an exact method is proposed that is based on the interplay between two branch-and-bound algorithms. Computational results on randomly generated instances show the value of each of the two kinds of flexibility. Their combination leads to average savings of up to about 30%.

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