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Séminaire conjoint / Joint Seminar

Chaire de logistique et de transport et Chaire de recherche du Canada en distributique /
Chair in Logistics and Transportation and Canada Research Chair in Distribution Management

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ELECTRIC VEHICLE ROUTING PROBLEMS WITH NON-LINEAR CHARGING FUNCTIONS

Abstract: In recent years, electric vehicle routing problems (eVRPs) have received an ever-increasing attention from the operations research community. In a nutshell, eVRPs extend classical routing problems to consider the limited driving range of electric vehicles. One of the key modelling aspects in eVRPs concern the battery charging process. Indeed, eVRP models strongly rely on assumptions about the charging function approximation. This approximation models the relationship between battery charging time and charging level. In practice, the battery charge level is a concave function of the charging time. Nonetheless, in the e-VRP literature, it is usually approximated using linear functions. In this talk, we introduce and discuss the family of e-VRPs with non-linear charging function approximations (eVRPs-NL). To motivate our research, we first present a computational study comparing (in terms of solution quality and feasibility) non-linear approximations with linear approximations commonly used in the literature. We then present models and (matheuristic) solution approaches for two different eVRP-NL variants. The first is a more theoretical variant that allows the audience to gain insight into these new problems. The second is a real-world problem faced by Enedis, a subsidiary of french electricity giant EDF.

Note: Jorge E. Mendoza is an Associate Professor at the department of Computer Science of Polytech Tours (France) and the co-director of the Operations Research, Scheduling, and Transportation research team at the Computer Science Research Laboratory of Université de Tours. He holds a B.Sc. (2004) in Industrial Engineering from Universidad Industrial de Santander (Colombia), a M.Sc. (2007) in Industrial Engineering from Universidad de los Andes (Colombia), and a Ph.D. (2009) in Computer Science from Université de Nantes (France) and Universidad de los Andes. His research interests include the design, development, and application of optimization techniques to: transportation science and logistics, decision support systems, and production planning and scheduling. Since 2015, Dr. Mendoza is the chair of electric vehicle routing optimization, a 4-year research program funded by the French national research agency (ANR).

MERCREDI / WEDNESDAY

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