

MODELING AND SOLVING PROBLEMS FOR URBAN MOBILITY

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This tutorial is devoted to illustrate how Combinatorial Optimization can be applied to problems arising in the context of urban mobility.

We first give a brief overview on different types of vehicle routing problems and then focus on two applications related to mobility services for handicapped people and the operation of car or bike sharing systems. We discuss both the static and the dynamic version of the resulting Pickup-and-Delivery problems and demonstrate how flows in time-expanded networks can be employed to model and solve such problems, based on results achieved in [1, 2, 3, 4, 5, 6].

References

- [1] S. Bsaybes, A. Quilliot, A. Wagler: Fleet management for autonomous vehicles using multicommodity coupled flows in time-expanded networks, *Leibniz Int. Proceedings in Informatics (LIPIcs)* 103 (2018)
- [2] S. Bsaybes, A. Quilliot, A. Wagler: Fleet management for autonomous vehicles: Online PDP under special constraints, *RAIRO-Oper. Res.* 53 (2019) 1007–1031
- [3] S. Bsaybes, A. Quilliot, A. Wagler: Fleet management for autonomous vehicles using flows in time-expanded networks, *TOP* 27 (2019) 288–311
- [4] P. Halffmann, S.O. Krumke, A. Quilliot, A. Wagler, J.-T. Wegener: On the Online Max-Accept Relocation Problem, In *Proc. of Odysseus 2015*, Ajaccio, France
- [5] S.O. Krumke, A. Quilliot, A. Wagler, J.-T. Wegener: Models and algorithms for carsharing systems and related problems, *Electronic Notes in Discrete Math.* 44 (2013) 201-206
- [6] S.O. Krumke, A. Quilliot, A. Wagler, J.-T. Wegener: Relocation in car-sharing systems using flows in time-expanded networks, *Lecture Notes in Computer Science* 8504 (2014) 87–98