

Optimal Scheduling for Mobile Battery Charging Systems

Master's thesis number: MT-16-22

Introduction and Background:

The fossil-free construction site often employs bio-fueled construction equipment that produces other pollutants such as particulate matter and nitrogen oxide but is not carbon neutral, meaning that fossil-free does not imply zero emissions. In Norway, a pilot project to provide electric energy to construction works in areas where access to the power grid is not available is now being evaluated. Although there has been no specific previous research effort on the electric vehicle scheduling problem for emission-free construction sites, the core idea behind the traveling salesman problem, vehicle routing problem, vehicle routing problem with time window, vehicle scheduling problem, and battery electric transit vehicle scheduling problem has been useful for the problem formulation in this thesis.

Problem Description and Objective:

A scenario in which a construction company intends to replace all conventional diesel equipment with electric counterparts in an emission-free construction site is investigated for a general formulation of the problem. The main tasks in this study are to schedule the recharge of the mobile battery container. The objectives of this thesis are to propose a general mobile battery charging scheduling problem, determine important variables and constraints, propose a realistic case scenario for the scheduling problem, formulate an optimization model, with objective functions, constraints, and other important parameters, solve the optimization problem using adequate tools and algorithms.

Collaboration:



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