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# Inspecting Electric Lines with Drones

This study addresses the routing for the inspection of electric lines with drones in Portugal, managed by EDP Labelec, the partner company in this project. There is a set of electrical lines that need to be inspected and a set of points where the drone operator can stop managing the drone for inspecting those lines. The objective is to determine an inspection plan —that is, the points where the drone operator stops and the routes performed by the drone —to inspect all the service lines, that minimizes the inspection time. This problem is modeled as an Extended Capacitated Arc Routing Problem (ECARP). The CARP is known to be NP-hard, as is this ECARP since it generalizes the CARP. The developed model is solved using CPLEX on smaller real instances generated using a GIS (Geographic Information System) available at the EDP Labelec. The quality of the solutions generated is assessed by the total inspection time, as well as feedback from the EDP Labelec team. This team evaluates the practical adequacy of the solutions, a crucial aspect for trips that need to be accepted by practitioners. Computational analysis will provide new insights for the development of new methodology to solve larger instances that feat the dimensions of the real ones.
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