Exact algorithms based on column generation for rich vehicle routing problems

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Problem definition

Vehicle Routing Problem with Time Windows (VRPTW)
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Pickup and Delivery Problem with Time Windows (PDPTW)

Extension of the VRPTW where a set of $n$ requests must be satisfied
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Pickup and Delivery Problems (applications)

- Shared rides
- Bike sharing
- Accessible transport of people with disabilities
- Shuttle services to airports
Problem formulation

Set of feasible routes for the PDPTW

Ex.:

All requests must be satisfied!

Feasible routes

Route 1 Route 2 Route 3

1 1
2 2
3 3
4 4
... ... 
n n
Column generation

Route generator (Subproblem)

* Shortest path problem with resource constraints
Thank you!

Questions?

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