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## **An iterative heuristic for strategic timetabling with integrated passenger routing in railway networks**

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Periodic timetabling is a crucial but computationally challenging problem in the railway planning field. Existing approaches often overlook the interaction between passenger routes and timetables, leading to suboptimal solutions. In this paper, we propose a method that incorporates passenger routing into the optimization of periodic timetables. Our goal is to optimize the periodic timetable from the strategic planning perspective, aiming to minimize the total perceived passenger travel time. We propose an iterative heuristic approach that integrates an adaptive large neighborhood search algorithm with a mixed-integer linear programming solver. To improve the efficiency of the algorithm, we design tailored operators and an outer loop. We conduct real-world case studies on real-life instances of Netherlands Railways to illustrate the effectiveness of our approach. The computational results show that our solution method is capable of addressing real-life problems.