

A Reinforcement Learning Approach for the Dynamic Vehicle Routing and Scheduling Problem with Stochastic Requests and Time-dependent, Stochastic Travel Times

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The Dynamic Vehicle Routing and Scheduling Problem with Stochastic Customer Requests and Time-dependent, Stochastic Travel Times (DVRSP-scr-tsst) represents a complex challenge where vehicle fleets must dynamically adapt to stochastic service requests as well as time-dependent and stochastic travel times. This study proposes a novel approach that uses reinforcement learning (RL) to effectively manage this complexity. The RL trains a deep neural network to facilitate real-time decision making. The RL approach makes the routing and scheduling decision for the DVRSP-scr-tsst, minimizing travel and waiting times and penalties for late arrivals and unserved customers.