

VRU-Personalized, Optimum, and Dynamic (POD) Routing

Abstract

Transport is a challenge for vulnerable road users, reducing their participation in social and recreational activities. Real-time mixing and matching transport-means from private, public, and on-demand transportation at different pick-up locations is a solution that improves mobility, providing the best multimodal transport options to wheelchair users, who are sensitive to dynamic environmental barriers. A dynamic route planning for wheelchair users is required to account for all constraints changing by time with a cost function. Although transportation agencies have favored a simpler static route planning, static planning is only satisfactory when conditions of intermediate nodes in the transportation networks are consistent and the same fixed routes are valid every day. Recalculating the static version without modeling nonlinear function for cost to destination may not appropriately reflect vulnerable road users' personal preference and tolerance to time. Especially, congested urban areas have less reliable transit arrival time at a stop which significantly increases cost of originally planned route of users with disabilities. Through personalization, optimization, and simulation, the proposed project will incorporate multimodal transportation information into the optimal route search. Artificial intelligence (AI) based algorithms to deal with complexity of algorithms and efficiently find optimal solutions.

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