

# **Maximizing the probability of arriving on time : Robust guidance**

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## **Abstract**

In this article, we address the problem of optimal guidance of road network users. In the literature, several routing algorithms have been proposed under different approaches to solve this problem. Most adaptive algorithms for optimal path are based on the least expected travel time. Another approach has emerged named the Stochastic On Time Arrival (SOTA). This approach based on the idea of Frank (1969), which aims to maximize the probability of arriving to a destination node parting from a given node in the network and with a given time budget. Our contribution consists here in extending this approach in order to introduce robustness towards path failure, in the guidance optimization. We propose a model that includes the existence as well as the performance of detours for selected paths, in the calculus of the travel time reliability. This new way of calculating travel time reliability guarantees a kind of robustness of the optimal guidance strategy. That is to say that, the travel time reliability associated to the obtained optimal guidance strategy is not likely to change, however associated adaptive paths change during the travel. The variation of the travel time reliability, with respect to a network structure changing, is thus improved.

## **Keywords**

Optimal guidance, Travel-time reliability, Robustness, Optimization, Traffic control.

## **Biography**

**Farida Manseur** actually is a PhD student in the French institute of science and transportation technologies, development and networks(IFSTTAR), he prepares her thesis in applied mathematics, under the supervision of Habib Haj-Salem. This thesis is frame by Nadir Farhi and Jean-Patrick Lebacque. She interested in robust guidance algorithms of users in road networks.

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