ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Distributed Computing

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BA/MA/SA/Group/Lab:

Competitive Taxis with Delay

Imagine a taxi company which gets called by customers who want to be picked up at different locations within the city. For every request from a customer, the service agent at the taxi company has to decide which one of the k taxi drivers should pick up the customer. As gas prices are high, the agent tries to assign taxis to customers such that the distance traveled by the taxis is as low as possible.

Of course, the company does not know in advance when and where its customers want to be picked up. An algorithm which solves the problem without knowing the requests in advance is called an online algorithm. Its performance is usually evaluated by comparing it to the cost of an optimal algorithm which can "see the future", i.e., it knows in advance when and where the customers want to be picked up. The ratio between the costs of the online and the optimal algorithm for the worst possible sequence of requests is called *competitive ratio*.

What if you do not need to serve each request immediately, but you may let the customer wait a few minutes, at the expense of paying some penalty for each minute that the customer has to wait? We already know that you can then prove a better competitive ratio than when you must not let customers wait. We have some ideas on how to extend these results that we would like to discuss with you in the first meeting, but we are also interested in your ideas.

Requirements: Interest in algorithms and theory. You will meet with your advisors on a weekly basis to discuss progress and open questions.

Interested? Please contact us for more details!

Contacts

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