MASTER'S PROJECT (SUMMER 2016)

TOPIC: ***A Double Auction Based Online Cab Booking System Using McAfee's Mechanism***

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LOCATION: Dion 305

COMMITTEE MEMBERS: Dr. Iren Valova and Dr. David Koop

ABSTRACT

A double auction allows multiple buyers and multiple sellers to simultaneously submit their bids to an auction marketplace. The marketplace determines who won the auction and then chooses a common reasonable price for the winners. A double auction can be beneficial for both buyers and sellers, where the buyers and sellers participate in the auction by entering their individual bids and let the marketplace fairly determine a reasonable price based on the current supply and demand of the market. In this project, we design a double auction based online cab booking system that allows passengers and drivers to set their maximum and minimum acceptable rates per mile, respectively. Factors that would contribute to an individual's bid may also include expected quality of service, the distance needed to be traveled, and how soon they need to be picked up. All winners of the auction will pay the same price; however, buyers with higher bids will be matched with sellers who had higher asking prices to ensure the best possible arrangement in terms of expected quality of services. We developed a prototype online cab booking system using RESTful web services, and adopted the McAfee's mechanism in a double auction to ensure buyers and sellers to provide their honest prices such that they cannot benefit from submitting fraudulent or inflated bids. To make the communications between the clients (i.e., passengers and drivers) and the server (i.e., marketplace) more efficient, we used asynchronous request and response processing on both the client and server side. Such a cab booking system is different from the current emerging services such as Uber and Lyft because it allows each user to specify their own honest prices based on the urgency of their situation as well as quality of services that they desire.