

**MASTER'S PROJECT (FALL 2017)**

TOPIC: *Implementation of an Auction-Based On-Demand Transport Application Using iOS Programming*

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DATE & TIME: Thursday, November 16, 2017, 10:00 AM

LOCATION: Dion 302E (Demo)

COMMITTEE MEMBERS: Dr. Paul Bergstein and Dr. Hua (Julia) Fang

ABSTRACT

Taxi and ride-sharing apps like Lyft and Uber, have simplified the process of booking a cab at a desired location with the least time consumption. Most of these apps offer dynamic models of pricing with surge prices during high-demand or peak hours. Such dynamic models do not truly reflect customers' needs, and may negatively affect those who expect reasonable prices. In order to solve this dilemma, we introduce a double auction based mechanism that allows multiple passengers and drivers to register their bids during an auction. The auction system determines the winners and decides a common reasonable price for them. The approach greatly benefits both the passengers and the drivers as they are offered prices based on their own valuation. In this project, we developed an iOS-based app using Swift as well as a server deployed on a scalable system infrastructure using Google's App Engine. We used the Google Maps API for fetching the location, and RESTful web services and Google Cloud Endpoints framework for developing services that can be shared by both mobile and web clients. An auction manager can start an auction at any location for a given amount of auction time. Both the drivers and passengers can take part in the auction by registering their bids using their iOS-based apps. Once the auction ends, the winning drivers and passengers will be notified immediately for the common price as well as their matching passengers and drivers, respectively. This iOS-based implementation, together with our previous implementation of Android-based app, demonstrates that our double auction based approach for on-demand transport is not only feasible, but also very efficient and effective.