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COLLEGE OF ENGINEERING

MASTER'S PROJECT (SUMMER 2017)

TOPIC: *Mobile Cloud Computing with Android Apps and Google App Engine for On-Demand Transport Services*

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ABSTRACT

On-demand transport services, such as Uber and Lyft, have made it possible for people to book cabs at their current locations with minimum possible time. Such services typically use dynamic pricing models, where fares may become quite high during peak times with high demands for rides. In these cases, drivers and passengers would have no option but to accept or reject the given offers. To resolve this issue, we adopt a double auction mechanism, which allows multiple drivers and multiple passengers to simultaneously submit their bids to an auction marketplace. The marketplace determines who win an auction and then sets up a common reasonable price for the winners. To ensure best possible arrangements, we match passenger winners with higher bids with driver winners who had higher asking prices. In this project, we develop mobile apps using Android SDK and Firebase SDK for drivers and passengers. The backend has been built on Google's scalable infrastructure, namely Google App Engine. We use the Google cloud endpoints framework to build RESTful web services, which can be shared by both mobile clients and web clients. We use Objectify, a Java data access API, to access the Google App Engine datastore. An auction manager can start an auction at any given location with predefined auction duration. Both drivers and passengers can participate in the auction by submitting their bids from the mobile apps. Upon completion of an auction, matched drivers and passengers are notified immediately. The demonstration of the Android apps and the web-based auction manager interface show that our double auction approach for on-demand transport service is very practical and effective.