

# The Effect of Size and Information on the Unique-Bid Auction – 1st Quarter Proposal

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To create an auction environment and to use that environment to track the effects of altered size and access to information on the auction results.

## 1 Purpose

The purpose of this project is to simulate a unique-bid auction environment and to economically analyze the auction results. When completed, this project would be an exercise in complex systems modeling, computer networking, artificial intelligence, and graphical interfaces and displays. When the environment program is perfected, I will alter the size and access to information and track the changes in the auction's performance.

## 2 Scope of Study

The difficult aspects of this project are its applications of complex-system modeling, artificial intelligence, graphical displays, and computer networking. Before these items are completed, I will need to review the network of the TJHSST CS lab and will need instructions to access it. When the project is done, I will have a single computer sending out information to and directing bidder computers, that will then send their own inputs to the auction computer. When the basic auction is perfected, I will move on to the economics side, altering the size of the auction and the information given to the bidders and accessing the changes in the auction outcomes.

### 3 Background

No academic work has been published in the unique bid auction because it is rarely used by auctioneers. This is because the significant profit from the auction goes to the winning bidder, with only a slight profit for the seller. However, the type of computer research being conducted in this project is similar to the work done in experimental economics, a relatively new field in which economic theory is tested and questioned through the use of human simulations.

There is a website similar to Ebay, at [www.UniqueAuction.com](http://www.UniqueAuction.com), that conducts real online auctions using a variation of the unique-bid auction. In a sense, my work would combine the foundation of [uniqueauction.com](http://uniqueauction.com) with the methodology of experimental economics.

### 4 Procedure and Methodology

This project will be done in the Java Language. The ultimate test for this program will be the real experiment in which human participants compete to win the auction. I will need to move ahead the timetable for this project to give myself sufficient time to conduct the experiment. After perfecting the GUI, artificial intelligence computerized players, and the graphical displays, I will convert the program to run simultaneously and to submit information to and from a common computer. I will need help to understand the way to network computers in the TJHSST labs because these processes are specific to each unique computer cluster. I can make any type of visual, as the graphical displays and economic results will be appropriate for many types of displays.

As of now, I am perfecting the display methods and the artificially intelligent robot players. For both of these steps, no input is required. However, in past and future versions, the player inputs (will input) the maximum value (range) of the bids and the number of players (size) in the auction before beginning. For each step of the the coding process, I have been using system prints and testing displays to confirm that code is working properly and is accepting all kinds of inputs, and the success from these steps suggests that the system is working. As of now, there has been little indication for the need of efficiency algorithms, as every scenario is processed in a timely manner.

The main concrete requirement for my program are that it must be able

to send information (to the auction computer) efficiently and accurately. The steps of my program's development are so clear and specific (generating GUI, creating auction display, networking computers, conduct experiment, analyze results), that in setting a deadline for each of these steps, I will be able to completely chronicle the project.

## **5 Expected Results and Value to Others**

In addition to a fully functional program, I hope to generate a basic economic paper explaining the results from my experiment. In addition to serving as an example for coding projects, I hope that my project can shed some light on the real economic issue of auction theory.