Privacy and Security in Online Auctions

Thesis submitted by
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Declaration

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institute of tertiary education. Information derived from the published and unpublished work of others has been acknowledged in the text, and a list of references is given.

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Abstract

Buying and selling online is inherently insecure. Misuse of an individual’s personal information is now the leading concern among those who engage in e-commerce. This thesis examines privacy and security issues in online auctions. Various auction fraud issues are investigated, and several novel counter measures proposed. An online auction server was constructed to aid in developing these security measures. This allowed investigation and testing in a controlled environment. The research results include:

1. A complete model for conducting secure and anonymous online auctions;
2. A method for detecting a fraudulent bidding practice referred to as shill bidding;
3. Autonomous bidding agents which bid maliciously. (Used to test the ability of the proposed security mechanisms);
4. A complete model for conducting secure and anonymous online share trading; and
5. Several alternate proposals for auction clearing algorithms.

The proposed security mechanisms have been implemented on the online auction server. Results are given as simulated and practical tests. In addition, the auction server’s software design is documented. Many of the techniques discussed in this thesis can be readily applied to commercial online auctions.
Contents

1 Introduction ................................................................. 1
   1.1 Aims ............................................................................ 2
   1.2 Methodology ............................................................ 2
   1.3 Results ...................................................................... 3
   1.4 Thesis Organisation .................................................. 3

2 Online Auction Software .................................................. 5
   2.1 RAS: A System for Supporting Research in Online Auctions .......... 5

3 Auction Privacy and Security Issues .................................... 15
   3.1 Security, Anonymity and Trust in Electronic Auctions ................ 15
   3.2 Design Issues for Electronic Auctions ................................ 24

4 Privacy and Security in English Auctions ............................ 33
   4.1 Secure Online English Auctions ..................................... 33

5 Fraudulent Auctioning Practices ......................................... 45
   5.1 Undesirable and Fraudulent Behaviour in Online Auctions .......... 45
   5.2 Detecting Shill Bidding in Online English Auctions ................. 56
   5.3 Detecting Collusive Shill Bidding ................................... 71

6 Software Bidding Agent Security ....................................... 82
   6.1 A Simple Shill Bidding Agent ....................................... 82
   6.2 A New Approach to Avoiding the Local Extrema Trap .............. 90
   6.3 An Adaptive Shill Bidding Agent ................................... 97

7 Privacy and Security in Continuous Double Auctions ............ 106
   7.1 Privacy and Security Concerns for Online Share Trading ............ 106
   7.2 An Anonymous and Secure Continuous Double Auction Scheme .... 114

8 Online Auction Software 2 ............................................... 125
   8.1 A Software Architecture for Continuous Double Auctions .......... 125
   8.2 Variable Quantity Market Clearing Algorithms ...................... 138

9 Conclusions .................................................................. 146