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A new phenomenon has emerged in electronic markets. Due to the low transaction costs and the high volatility in these markets many net market makers are using auction mechanisms to buy and sell goods. Recent market studies predict that by 2002 a quarter of all transactions will use dynamic pricing concepts. The design and customization of these market mechanisms involves a number of disciplines including economics, computer science and operations research.

This multi disciplinary book summarizes the introductory economics needed to understand electronic markets and surveys the literature on negotiation and auction theory. It is the first book to combine both the relevant economic and computer science aspects of electronic markets, and the first to describe the variety of new multidimensional auction mechanisms. It uses a number of real world case studies including the trading of financial derivatives.

MARTIN BICHLER is an Associate Professor in Information Systems at the Vienna University of Economics and Business Administration. He is currently visiting scientist at the IBM TJ Watson Research Center in New York. Dr Bichler is Associate Editor of the Electronic Commerce Research Journal, and has served as organizer and program committee member in numerous conferences in Electronic Commerce and Information Systems. His research focuses on electronic commerce infrastructures and advanced market mechanisms.

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Preface

Electronic markets are breaking new ground in old industries by providing them with a wealth of supply chain information via the Internet. The way that net market makers match buyers and sellers is key to the success of a marketplace and the design of electronic marketplaces has become a million-dollar business. This is a challenging field for both the business and the academic community.

This book introduces a framework of negotiation protocols for electronic markets. In particular, I will focus on multi-dimensional auction mechanisms which allow automated negotiation on multiple attributes and/or multiple units of a product. The findings and analyses should be useful to an audience of scholars as well as practitioners involved in the business of electronic market design. Through this book a reader should be able to understand the multitude of technical and economic issues involved in the design of electronic marketplaces. In contrast to purely economic treatments of this topic, the book combines aspects of both economics and computer science. The book provides a detailed description of the various negotiation protocols, which will be a valuable resource for systems engineers and designers. It also covers the relevant theoretical concepts in this multi-disciplinary field and should, therefore, be of interest to the wider academic community.

It is often difficult to write a book about a fast-moving subject. Describing the past is relatively easy. Predicting the future with reasonable accuracy is possible if the discussion is based on a good understanding of the fundamentals. I have tried to make the description of technical issues as robust as possible without tying it too closely to a particular product or development. Articles in magazines and newspapers can give an up-to-date picture of events. All web addresses (URL) cited in the text have been checked as at May 2000, but may have changed afterwards.

The book grew out of my research at the Vienna University of Economics and Business Administration and at the University of

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California at Berkeley. Most of the technical expositions of electronic brokerage described in chapter 2 result from my work on the OFFER project in Berkeley. At that time I became fascinated by auction design and developed the first ideas about multi-attribute auctions. The laboratory experiments as well as the simulation studies described in chapters 6 and 7 were conducted in Vienna. The article upon which parts of chapter 6 are based was published in the *Decision Support Systems* journal. Some of the material from chapters 3 and 7 was published in the *Journal of End User Computing* and *Wirtschaftsinformatik*, respectively. I hope that having read this book you will share my fascination with this exciting research topic.

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Vienna, June 2000
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