University of St Andrews

School of Computer Science

DISTINGUISHED LECTURE SERIES 2007/08

Market-Based Systems

By

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University of Bristol

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2nd Year Laboratory, Jack Cole Building

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Biography

Dave Cliff is a Professor of Computer Science at the University of Bristol. He has a BSc in Computer Science and an MA and PhD in Cognitive Science. He has previously worked in faculty posts at the University of Sussex (UK), at the MIT Artificial Intelligence Lab (USA), and at the University of Southampton (UK). He also spent seven years working in industry: initially as a senior research scientist at the Hewlett-Packard Labs European Research Centre in Bristol, UK, where he founded and led HP's Complex Adaptive Systems research group. At HP, he developed adaptive autonomous trading algorithms and automatic optimization and design techniques for market mechanisms and online exchanges. He has also been a Director for Deutsche Bank's Foreign Exchange Complex Risk Group on Deutsche's Foreign Exchange trading floor in the City of London.

In October 2005, Dave was appointed Director of a UK national research and training initiative, addressing issues in the science and engineering of Large-Scale Complex IT Systems (LSCITS). He is author or co-author on over 70 academic publications, inventor or co-inventor on 15 patents, and he has undertaken advisory and consultancy work for a number of major companies and for the UK Government. He's given well over 100 invited keynote lectures and seminars; and he and his work has frequently been featured in the press and on TV and radio.

Program

Market-Based Systems

Over the last ten years, computer giants IBM and Hewlett-Packard have each invested significant research effort in developing algorithms that embody strategies for trading in "electronic marketplaces", and in algorithms that offer radical new types of electronic marketplace. This industrial research has been paralleled internationally by a number of academic research groups with similar ambitions. Some of this research is motivated by the desire to create autonomous agents for e-commerce applications, some of it is aimed at doing better resource allocation and control in large-scale distributed data-centers and grid systems, and some of it is aimed at creating predictive models of real financial systems. As it happens, in the last few years there has been an explosion of interest in using such techniques in the global financial markets.

These three lectures take a selective walk through the motivation, the background, the key results, the state of the art, and end with some wild hand-wavy speculations on where things will go next.

Absolutely no previous knowledge of economics is required.

10.00– 11.00 **Lecture 1: Rationale and Background**

Here we'll find out why computer scientists should care about market-based systems, review some notable applications, and also cover some of the background economics. They call economics "the dismal science" for a reason, so that background economics stuff won't delay us too long...

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11.00 – 11.30 ***Coffee***

Coffee area

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11.30 – 12.30 **Lecture 2: Artificial Trading Agents for Fun and Profit**

This lecture tells the story of some of the best-known algorithms used for autonomous "trader-robots", and how they were found to consistently beat human traders.

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14.30 – 15.30 **Lecture 3: What's hot, what's not, and where next: Tales from the City**

Looks at work on automatic optimization and design of trader-agents, and online market mechanisms, with particular reference to the current hot topics in the automated trading technology in the financial markets

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