PROGRAMME

November 28, 2005

HP Grenoble - Auditorium

Morning

9:30	Opening Addresses – HP Site Director, VP/CTO of HPS, HPF Director of Education EU/EC FET Representative, President of European Complexity Systems Society, LSE Co-organizer/Moderator
10:00	Invited Talk – Dr Bernardo Huberman, HP Senior Fellow, Harvesting Social Knowledge
11:00	Coffee Break
11:15	Prof. Eve-Kelly Mitleton, London School of Economics LSE Business Cases: Rolls-Royce Marina Project LSE
11:45	Discussion
12:00	Prof Dr Paul Bourgine - European Complex System Society The Science of Complex Systems
12:15	Lunch – Guest Room

Afternoon

13:30	Invited Talk – Dr Richard Taylor Self-Managed Systems – a Control Theory Perspective
14:15	Discussion Threads
15:00	Coffee Break
15:15	Invited Talk – Dr Pierre Bessiere - CNRS Bayesian Approach to Uncertainty in Complex Systems
16:15	Discussion Threads/5 min Slots
16: 30	Concluding Remarks
17:00	Closure

SUMMARIES

Information flow in social networks

BERNARDO HUBERMAN, Senior HP Fellow and Director of the Information Dynamics Lab at Hewlett Packard Laboratories. Consulting Professor in the Department of Applied Physics at Stamford University.

Introduction

The flow of information in business organisations affects productivity and innovation because it determines the speed by which individuals can act and plan future activities. However, it may take place within social networks whose nature and existence is sometimes difficult to identify, because they are often different from what we might infer from the formal structure of a group or organisation.

E-mail, as the predominant means of communication, offers a unique opportunity to observe the flow of information along both formal and informal channels. It is a good medium for social network research, providing plentiful data in electronic form and allowing the discovery of shared interests and relationships which were not previously known. The tendency of individuals to associate according to common interests influences the way information spreads throughout a social group and, whilst personal privacy policies rule out direct associations between individuals and particular e-mail messages, analysis of links and word content can indicate collaboration and knowledge exchange. A number of tools have now been used to extract and aggregate the data enabling conclusions to be made about 'small world' dynamics, 'collaborative tagging' and 'viral marketing'.

The Rolls Royce Marine Project

EVE MITLETON-KELLY, Director, Complexity Research Programme, London School of Economics.

Introduction

Different qualitative and quantitative tools provide rigour in understanding an organization by triangulating the data and testing the findings against the conceptual framework of complexity theory. The Rolls Royce project is an interesting case history where post-merger integration posed a particular problem and the solution depended upon an in-depth analysis of social interdependencies. Different, but complementary information about the organisation offered a deep understanding of real problems. This was used as an informed basis for creating an enabling infrastructure, based on social, cultural and technical conditions that facilitated the emergence of new ways of organizing working practice.

The Science of Complex Systems

PAUL BOURGINE, Professor at the Ecole Polytechnique, co-coordinator of Once-CS that facilitates both the promotion and education for research on complexity science.

Introduction
Complexity Science is not yet a science, but it is a movement towards a new science. There has been a debate about using the terms 'complexity science' and 'complex systems science'. Professor Bourgine prefers the term 'complex systems science' because 'complexity' is a much more ambiguous word. First he discussed the nature of complex systems. The subject can be approached in two ways: either in terms of its 'extension' involving a search for examples of complex systems in a number of different areas or in terms of human 'intention' which is to do with the ways in which scientists can understand such systems.

The list below contains examples of both natural and artificial systems that intuitively seem to exhibit properties of a similar kind. As science begins to discover what such systems have in common the distinction between artificial and natural systems disappears and because more and more adaptive artificial systems are being designed the same kind of studies can be made to solve the same kind of problems.

Self Managed Systems - A Control Theory Perspective

RICHARD TAYLOR, Principal Scientist, Model Based Analysis Group, HP Laboratories.

Introduction
Self-managed systems are essentially closed loop control systems. For any control system, slow convergence, oscillation, chaotic behaviour or stuck modes are undesirable. It is argued that control functions and compositions should be restricted to those with known 'good' properties whose functional space can be demonstrated within cellular automata.

Background
I want to take an approach to complex and complicated systems which is highly utilitarian. I started to become interested in emergent behaviours about 16 or 17 years ago, when I became aware of things such as cellular automata which seemed to be quite interesting models of computation. Subsequently I developed switching systems that exploited particular properties of cellular automata to make them more amenable to dependable systems analysis. Over the last five years I have split my time between Hewlett Packard laboratories and Hewlett Packard services solving problems for customers.

The Bayesian Aspect of Complex Systems

PIERRE BESSIERE, Senior researcher at the French National Centre for Scientific Research (CNRS).

Introduction
The LAPLACE research group has been working on stochastic models for perception, inference, learning and action since 1992. The central thesis is that a subjectivist approach to probability is a simple mathematical theory of cognition and rationality as an alternative and extension of logic. During this time the group has elaborated the Bayesian Programming methodology and software tools.