

# Adaptive and Emergent Behaviour and Complex Systems

Proceedings of the 23<sup>rd</sup> Convention of the Society for the Study of Artificial Intelligence and Simulation of Behaviour (AISB'09)

6<sup>th</sup>-9<sup>th</sup> April 2009, Heriot-Watt University, Edinburgh, UK

## PREFACE BY THE CONVENTION CHAIR

It seems almost inevitable that, as computing power increases, the systems we develop become more and more complex. This complexity manifests itself at many levels. Examples which spring to mind are connectionist, evolutionary and immune systems; swarm intelligence; social computing; pervasive and ubiquitous computing; robotics; and affective computing.

Natural, both biological and social, examples of complex systems are plentiful and offer considerable insight into the theories and algorithms which can be developed for use in artificial self-organising systems. New avenues are continually opening up for intelligent systems which are inspired by natural phenomena.

Furthermore, our increasing reliance on highly complex systems makes ever greater demands on criteria for dependability and usability. Automated theorem proving for program proof in safety critical systems and intelligent interfaces for personalised adaptation in pervasive environments are just two of the many areas in which AI techniques can be used to enhance the human capacity to utilise complex systems effectively.

The annual conventions of the Society for the Study of Artificial Intelligence and Simulation of Behaviour (SSAISB) comprise a collection of symposia. Some symposia directly address the theme selected for that year's convention and others are more loosely related to the theme, whilst some are perennial; running every year irrespective of the theme in any given year.

The SSAISB conventions are intended to provide more than just another stage upon which experienced researchers can present their state of the art contributions to the field. They are also intended to provide a forum for young researchers and research students, whose ideas are still developing, to present and discuss their theories and plans with the research community at large.

The 23<sup>rd</sup> Convention (AISB'09) was hosted at the Edinburgh Conference Centre on the Riccarton campus of Heriot-Watt University. It consisted of 12 symposia covering a diverse range of technical and social issues relating to complex systems in the context of artificial and natural intelligence and behaviour.

The convention was scheduled to coincide with the Edinburgh International Science Festival and the four keynote speakers addressed a lay audience as part of the festival's programme of evening talks.

## KEYNOTE SPEAKERS

### Mr Ken MacLeod

*"Souls in Steel: How Science Fiction has Imagined AI"*

**Abstract:** From clanking Robots, through electronic brains, to emergent minds in the Internet, science fiction has imagined how artificial intelligence might influence, enrich, transcend or terminate human life. What do these imaginings tell us about artificial intelligences...and about our own?

### Dr. David Fogel

*"Evolutionary Computation: Future of Machine Intelligence"*

**Abstract:** The development and testing of Blondie24, an evolutionary program that taught itself how to play draughts without human expertise, and its extension to a self-learning chess program, the first such program to defeat a nationally ranked master.

### Professor Kerstin Dautenhahn

*"Is there a Future for Robot Companions?"*

**Abstract:** This talk will provide examples of some new (and some not so new) visions and robotic systems and critically reflect on the use and usefulness of such present and future robot companion technology.

### Professor Alan Bundy

*"Why Robots must be Relativists"*

**Abstract:** To sense the environment, make predictions, form plans and act, robots and other autonomous agents must form internal models of the world including modelling other agents. How can agents with different world models communicate with each other?

Professor Nick Taylor  
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## THE SYMPOSIA

### **Killer Robots or Friendly Fridges: the Social Understanding of Artificial Intelligence**

Greg Michaelson (Heriot-Watt University)  
Ruth Aylett (Heriot-Watt University)

### **New Frontiers in Human-Robot Interaction**

Kerstin Dautenhahn (University of Hertfordshire)

### **2nd Swarm Intelligence Algorithms and Applications Symposium (SIAAS-09)**

Aladdin Ayesh (De Montfort University)

### **2nd PERADA Workshop on Pervasive Adaptation (Emergence)**

Emma Hart (Napier University)  
Nick Taylor (Heriot-Watt University)

### **PERSIST Workshop on Intelligent Pervasive Environments**

Sarah McBurney (Heriot-Watt University)  
Eliza Papadopoulou (Heriot-Watt University)

### **Social Networks and Multi-Agent Systems Symposium (SNAMAS-09)**

Giulia Andrighetto (ISTC-CNR Rome)  
Guido Boella (University of Turin)  
Jaime Sichman (University of Sao Paulo)  
Harko Verhagen (Stockholm University)

### **AI and Games**

Daniela Romano (University of Sheffield)  
David Moffat (Glasgow Caledonian University)

### **Mental States, Emotions and their Embodiment**

Nadia Berthouze (University College London)  
Marco Gillies (Goldsmiths College London)  
Aladdin Ayesh (De Montfort University)

### **Persuasive Technology and Digital Behaviour Intervention**

Judith Masthoff (University of Aberdeen)  
Floriana Grasso (University of Liverpool)

### **Workshop on Matching and Meaning**

Fiona McNeill (University of Edinburgh)

### **Evolutionary Systems**

David Corne (Heriot-Watt University)  
Pier Frisco (Heriot-Watt University)  
Alan Reynolds (Heriot-Watt University)

### **2nd AISB Symposium on Computing and Philosophy**

Mark Bishop (Goldsmiths College London)

## POSTERS AND OTHER EVENTS

Six entries were received for the student poster competition and the award for the best poster was presented by Mark Bishop, Chair-elect of the SSAISB, to Andrea Bauer.

Aldebaran Robotics provided demonstrations of their Nao anthropomorphic robots throughout the convention.

## LOCAL ORGANISING COMMITTEE

Yussuf Abu-Shaaban  
Ruth Aylett  
Keith Brown  
Alison Cawsey  
Dave Corne  
PierLuigi Frisco  
Raphael Kominis  
Sandy Louchart  
June Maxwell  
Sarah McBurney  
Eliza Papadopoulou  
Rob Pooley  
Nick Taylor

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