

## Congress Schedule

### Tuesday June 26th, 2001

08:00 - 17:00 hrs	Registration at conference site
10:30 - 11:30 hrs	Coffee will be available
12:30 - 14:00 hrs	Lunch Break
15:00 - 16:00 hrs	Coffee will be available
17:00 - 18:30 hrs	Welcome reception at the Paisley Museum

#### **Tutorials**

09.30 – 12.30 hrs	Prof. Mark Girolami, Scotland, UK Text based information retrieval
09.30 – 12.30 hrs	Prof. Peter Anderson, USA Introduction 'Current Trends in Evolutionary Computation'
14.00 – 17.00 hrs	Prof. Raul Gallard, Argentina 'Current Trends in Evolutionary Computation to Face Scheduling Problems'
14:00 - 17:00 hs	Prof. Juan Manuel Corchado, Spain Neuro-symbolic Systems. ANN And CBR Systems In The Forecasting Domain'

**Wednesday June 27th, 2001**

08:00 - 17:00 hrs	Registration at conference site
09:00 - 10:00 hrs	Plenary Speech by Prof. Nicholas Radcliffe 'Incorporating Domain Knowledge into Evolutionary Search'
10:00 - 10:15 hrs	Awards former day
10:15 - 10:45 hrs	Coffee Break
10:45 - 16:00 hrs	Workshop by Prof. Juan Manuel Corchado, Spain 'Knowledge Management: The future has arrived'
10:45 - 12:45 hrs	Parallel Technical Sessions SOCO: Agents and Dynamical Systems ISFI: Agents, Instruments and Controls
12:45 - 14:00 hrs	Lunch Break
14:00 - 15:00 hrs	Plenary Speech by Mark Plumbley 'ICA and Related Models Applied to Audio Analysis and Separation'
15:00 - 15:30 hrs	Coffee Break, Poster Session SOCO 2001
15:30 - 17:30 hrs	Parallel Technical Sessions SOCO: Fuzzy Sets I

**Thursday June 28th, 2001**

09:00 – 13:00 hrs	Registration/ hospitality desk
09:00 - 10:00 hrs	Plenary Speech by Prof. Edward Szczerbicki 'Management of Information in Complex Systems'
10:00 - 10:15 hrs	Awards former day
10:15 - 10:45 hrs	Coffee Break, Poster Session ISFI 2001
10:45 - 13:00 hrs	Workshop by Prof Juan Manuel Corchado, Spain 'Artificial Neural Networks in Patters Recognition'
10:45 – 15:00 hrs	Invited session by Prof. Raul Gallard, Argentina and Prof. Peter Anderson, USA ‘Current Trends in Evolutionary Computation to Face Scheduling Problems’
10:45 - 12:45 hrs	Parallel Technical Sessions SOCO: Fuzzy Sets II SOCO: Expert Systems
12.45 – 14.00 hrs	Lunch Break
14.00 - 16.00 hrs	Parallel Technical sessions SOCO: Neural Networks I ISFI: Rules & Experts
16:00 – 20:00 hrs	Break
20:00 - 23:00 hrs	Congress banquet at the Paisley Town Hall

**Friday June 29th, 2001**

09:00 – 13:00 hrs	Registration/ hospitality desk
09:00 - 10:00 hrs	Plenary Speech by Dr. Amir Hussain 'Non-linear Techniques in Speech Processing'
10:00 - 10:15 hrs	Awards former day
10:15 - 10:45 hrs	Coffee Break
10:45 - 12:45 hrs	Parallel Technical Sessions SOCO: Neural Networks II ISFI: Artificial Neural Networks
12:45 - 14:00 hrs	Lunch Break
14:00 - 16:00 hrs	Parallel Technical Sessions SOCO: Evolutionary Algorithms SOCO: Neural Networks III
15:00 - 16:00 hrs	Coffee will be available
16:00 - 16:30 hrs	Closing ceremony and today's awards
16:30 hrs	End of conference

## **Tuesday June 26th, 2001**

### **Tutorials**

**Time:** 09.30-12:30 hrs

### **Introduction on Current Trends in Evolutionary Computation**

**by Prof. Peter Anderson**

Rochester Institute of Technology, USA

### **Text based Information Retrieval**

**by Prof. Mark Girolami**

University of Paisley, Scotland, UK

### **Tutorials**

**Time:** 14.00-17:00 hrs

### **‘Current Trends in Evolutionary Computation to face Scheduling Problems’**

**by Prof. Raul Gallard**

National University of San Luis, Argentina

#### **Abstract**

The task of scheduling is the allocation of jobs over time when limited resources are available, where a number of objectives should be optimized, and several constraints must be satisfied. Scheduling problems differ according to the resource environment, restrictions and objective functions to be considered. Very common scheduling problems belongs to the NP-hard problems. Consequently, diverse heuristics has been developed to face them. Evolutionary algorithms showed their effectiveness and efficiency to solve a wide variety of scheduling problems. Latest improvements in Evolutionary Computation include multirecombination and parallelism. This tutorial will show diverse novel evolutionary techniques applied to single machine, parallel machines, job shop and flow shop scheduling problems. Single and multicriteria optimization of diverse objectives will be discussed.

### **‘Neuro-symbolic Systems. ANN And CBR Systems In The Forecasting Domain’**

**by Juan M. Corchado**

University of Salamaca, Spain

#### **Biography**

Juan M. Corchado (Ph.D.) received a PhD. in Artificial Intelligence from the University of Paisley (UK) in 2000. At present he is Associate Professor at the University of Salamanca (Spain), previously he was Sub-director of the Escuela Superior de Ingeniería Informática of the University of Vigo (Spain, 1998-00) and Researcher at the University of Paisley (UK, 1995-98). He has been a research collaborator with the Plymouth Marine Laboratory (UK) since 1993. He has worked on several Artificial Intelligence (AI) Research projects sponsored by Spanish and European public and private Institutions. He is the co-author of over 50 books, book chapters, journal papers, technical reports, etc. published by organisations such us IEEE, IEE, ACM, AAI, Springer Verlag, Elsevier, Morgan Kaufmann, etc, most of these present practical and theoretical achievements of Hybrid AI Systems.

#### **Abstract**

Research into artificial intelligence (AI) has produced various hybrid problem-solving methods, which may be applied to give more powerful computer based problem solving capabilities than may be obtained using purely algorithmic methods. The reason for the application of an AI approach is very often precisely

because the nature of the problem to be addressed is such that no appropriate algorithm is either known or is applicable. For example, if the knowledge about a problem is incomplete or fuzzy, it may be difficult to select or to develop an algorithm or even an AI approach to solve it. It is in such situations where hybrid AI systems may be effective.

Case-based reasoning systems have proved to be successful in situations where prior experience of solving similar problems is available. But the nature of a complex problem solving situation may be such that there are different aspects of the problem that may best be addressed through the application of several distinct problem solving methodologies.

In particular, the application of artificial intelligence methods to the problem of describing the ocean environment offers potential advantages over conventional algorithmic data processing methods; an AI approach is, in general, better able to deal with uncertain, incomplete and even inconsistent data. Neural network, case-based and statistical forecasting techniques could be used separately in situations where the characteristics of the system are relatively stable (Lees *et al.*, 1992). However, time series forecasting, based on neural network or statistical analysis, may not provide sufficiently accurate forecasting capability in chaotic areas such as are found near a *front* (i.e. an area where two or more large water masses with different characteristics converge).

During this tutorial it will be presented a *universal* forecasting strategy, in which the term universal is taken to mean a forecasting tool which is able to operate effectively in any location, of any ocean. It will be described the application of a hybrid artificial intelligence approach to prediction in the domain of oceanography. A hybrid artificial intelligence strategy for forecasting the thermal structure of the water ahead of a moving vessel is presented.

This approach combines the ability of a case-based reasoning system for identifying previously encountered similar situations and the generalising ability of an artificial neural network to guide the adaptation stage of the case-based reasoning mechanism. The system has been successfully tested in real time in the Atlantic Ocean; the results obtained are presented and compared with those derived from other forecasting methods. The case-based reasoning system is used to select a number of stored cases relevant to the current forecasting situation. The neural network retrains itself in real time, using a number of closely matching cases selected by the CBR retrieval mechanism, in order to produce the required forecasted values.

## **Wednesday June 27th, 2001**

### **Plenary Speech**

**Time: 9:00 – 10:00**

#### **‘Incorporating Domain Knowledge into Evolutionary Search’**

**by Prof. Nicholas J. Radcliffe**

University of Edinburgh, Scotland, UK

**Time: 09:00-10:00 hrs**

#### **Biography**

After receiving a B.Sc. in Mathematical Physics at Sussex, Radcliffe went to Edinburgh to do a Ph.D. in Theoretical Physics. While at Edinburgh, his interests turned to Neural Networks and then Genetic Algorithms and he ended up writing a thesis on the Theory of Genetic Algorithms for his Ph.D. This laid the foundations for the theory of Forma Analysis, which he developed over subsequent years, latterly with Patrick Surry. Radcliffe has applied evolutionary algorithms and other stochastic search methods successfully to a range of industrial applications including oil production scheduling, gas pipeline sizing and commercial credit scoring. In 1995 he formed Quadstone Limited as a spin-out from Edinburgh University's Parallel Computing Centre EPCC). Quadstone has grown to be a leading global supplier of customer behaviour modelling solutions from its Edinburgh base. Radcliffe continues his affiliation with Edinburgh University, where he was appointed as a Visiting Professor in OR group of the department of Mathematics and Statistics in 1995.

#### **Abstract**

Both intuition and results such as the "No Free Lunch" theorem tell us that Evolutionary Search can only be successful if domain knowledge is captured and incorporated successfully. This is most commonly achieved indirectly through implicit domain knowledge captured in the representation chosen. Forma analysis provides methods for capturing such knowledge more explicitly and deriving problem-specific versions of standard ("representation-independent") search operators that manipulate the structures suggested by this captured knowledge. This allows identical (formal) search algorithms to be applied to widely different search domains, and enables us to migrate discoveries made in one domain to others.

**Wednesday June 27th, 2001****Workshop****‘Knowledge Management: The future has arrived’ (KM’2001)****Organizer:** Prof. Juan M. Corchado, Spain**Time:** 10.45-16:00 hrs**Description:**

The workshop covers all technical and organizational aspects of the integration of knowledge management systems and applications of the existing IT-infrastructure, especially management support systems. We welcome contributions with strong theoretical or technical backgrounds as well as contributions that focus on practical experience

The aim of the workshop is to offer a critical introduction to current approaches to knowledge management in organizations. These are the management of codified knowledge, the management of knowledge to support processes, and the management of knowledge creation.

- |           |   |
|-----------|---|
| 10:45 hrs | Introduction<br>Juan Corchado<br>University of Salamanca, Spain   |
| 11:00 hrs | #1824-124<br>‘A Model for Integrating Knowledge into Component-Based Software Development’<br>Dr. Agustin Cernuda del Rio, J.E.L. Gayo, J.M.C. Lovelle<br>University of Oviedo, Spain   |
| 11:20 hrs | #1824-125<br>‘Automating the Revision Phase of a Case-based Reasoning System using Belief Revision’<br>Dr. R. Rial Pavon*, R. Laza Fidalgo*, A. Gomez Rodriguez*, J.M. Corchado Rodriguez**<br>*University of Vigo, Spain, **University of Salamanca, Spain |
| 11:40 hrs | #1824-126<br>‘A Case-based Reasoning System for Business Internal Control’<br>Dr. M. Lourdes Borrajo Diz*, J.M. Corchado Rodriguez**, J. C. Y. Lopez*<br>*University of Vigo, Spain, **University of Salamanca, Spain,                                      |
| 12:00 hrs | #1824-127<br>‘Knowledge Management Systems’<br>Dr. M. Lourdes Borrajo Diz*, J.M. Corchado Rodriguez**, J. C. Y. Lopez*<br>*University of Vigo, Spain, **University of Salamanca, Spain,   |
| 12:20 hrs | #1823-128<br>‘Knowledge Management and measuring Intellectual Capital in Business Organisations’<br>Dr. Teresa Peña Perez*, D.L.J. Aguilar**, D.M.A.M. del Campo*, L.S.Barcelona*<br>*University of Burgos, Spain, **University of Salamanca, Spain         |
| 12:40 hrs | Lunch break   |

- 14:00 hrs #1824-129  
'Approaching an Object-Oriented Methodology for Building Software Agents in Knowledge Management'  
Dr. Andres Castillo, Y. Saez, O. Sanjuan, L. Joyanes  
University of Salamanca, Spain
- 14:20: hrs #1824-131  
'Low-Level Interactive Discourse Adaption Based on Cognitive Models'  
Dr. Martín González Rodríguez, J.M. Cueva Lovelle, M.P. Paule Ruiz, J.R. Pérez Pérez  
University of Oviedo, HCIRA, Spain
- 14:40 hrs Coffee break
- 15:00 hrs #1824-132  
'Automatic Testing of Navigation Patterns for Knowledge Distribution'  
Dr. Martin Gonzalez Rodriguez, J.M. Cueva Lovelle, M.P. Paule Ruiz, J.R. Pérez Pérez  
University of Oviedo, Spain
- 15:20 hrs #1824-133  
'Knowledge Management in an Information Retrieval Multiagent System'  
Dr. Pedro Cuesta, A. Gómez, M. Encarnación González, R. Laza, F.J. Rodríguez  
University of Vigo, Spain
- 15:40 hrs Concluding discussions
- 16.00 hrs End of Workshop

**Wednesday June 27th, 2001****SOCO 2001: 'Agents and Dynamical Systems'****Time: 10:45-12:05 hrs**

- 10:45 hrs #1824-025  
 'Analysis of the Correlation Between Majority Voting Error and the Diversity Measures in Multiple Classifier Systems'  
 Mr. Dymitr Ruta, Bogdan Gabrys  
 University of Paisley, UK
- 11:05 hrs #1823-032  
 'Collision free movement of a group of vehicles - control algorithm and simulation'  
 Dr. Sci. Jerzy Józefczyk  
 Systems Research Institute of Polish Academy of Sciences, Poland
- 11:25 hrs #1823-114  
 'A New Approach for the Numerical Integration of Non-Linear Dynamic Systems Considering Remainder'  
 Prof. Zhaochang Zheng, Dept. of Engineering Mechanics, China  
 Zhixiao Su\*, W.G. Price\*\*, Jingtang Xing\*\*  
 \*Tsinghua University, China, \*\*University of Southampton, UK
- 11:45 hrs #1813-123  
 'Scalability And Optimisation of a Committee of Agents Using Genetic Algorithm'  
 Dr. Tshilidzi Marwala\*, P. de Wilde\*, L. Correia\*\*, P. Mariano\*\*, R. Ribeiro\*\*,  
 V. Abramov\*\*\*, N. Szirbik\*\*\*, J. Goossenaerts\*\*\*  
 \*Imperial College, England, \*\*Universidade Nova Lisboa, Portugal, \*\*\*Eindhoven University of Technology, The Netherlands

**Wednesday June 27th, 2001****ISFI 2001: 'Agents, Instruments and Controls'****Time: 10.45- 12.25 hrs**

- 10:45 hrs #1814-014  
'A Novel Controller for DC-DC Converters'  
Prof. C.P. Kwong, C.M. Lee, Yan Xu, Mark S.K. Lau  
The Chinese University of Hong Kong, Hong Kong
- 11:05 hrs #1813-048  
'Application of Peano for Signal Validation in a Gas-Fuelled Cogeneration Plant'  
Dr. Massimo Sepielli, P.C. Incalcaterra, Italy  
P.F. Fantoni, D. Roverso  
Instituut for Energiteknikk, Norway
- 11:25 hrs #1813-052  
'Intelligent System for Business Competencies Management'  
Prof. André-René Probst, Y. Jussupova, M. Rossi  
University of Lausanne, Switzerland
- 11:45 hrs #1814-071  
'An Agent For Calculating The Best Urban Traffic Plan Constrained By Soft Temporal Deadlines'  
Dr. Luis Amable Garcia Fernandez, Departamento de Informatica, Spain  
F. Toledo, Universitat Jaume I, Spain
- 12:05 hrs #1813-104  
'Application of Artificial Intelligence Techniques to the Recognition of Partial Discharge Signatures in Gas Insulated Substations'  
Dr. Eleni E. Mangina, S.D.J. McArthur, A. de Montlebert, J.R. McDonald  
University of Strathclyde, Glasgow, UK

**Wednesday June 27th, 2001**

**Plenary Speech**

**Time: 14:00 – 15:00**

**‘ICA and Related Models Applied to Audio Analysis and Separation’**

**by Prof. M D Plumbley, S A Abdallah, J P Bello, M E Davies, J Klingseisen, G Monti and M B Sandler**

King's College London, United Kingdom

Presented by Prof. Mark Plumbley

**Biography**

Dr Plumbley began his work on neural networks at Cambridge University Engineering Department as a Research Student under the late Frank Fallside, continuing as a Research Associate using genetic algorithms to modify neural networks. Dr Plumbley joined King's College London in 1991, moving to the Department of Electronic Engineering in 1995.

Dr Plumbley's research expertise is in neural networks and learning systems, and in particular in so-called "unsupervised" neural networks which learn from unlabelled data, and in applications of Shannon's information theory. He is currently applying this work to the analysis and separation of audio and music signals.

Dr Plumbley has been joint coordinator of the "NEuroNet" European Network of Excellence in Neural Networks (1994-2001), and is a key node in the new "EUNITE" European Network of Excellence in Smart Adaptive Systems. He is a member of the IEEE, an Associate of the IEE, a Fellow of the Cambridge Philosophical Society, and a past Treasurer of the European Neural Network Society (1994-98).

**Abstract**

Over the last decade, an increasing number of researchers have become interested in the problem of Computational Auditory Scene Analysis (CASA), the use of computers to recognize sound sources in a complex auditory environment. In this paper, we give an overview of some approaches we are using in this area, and in particular for automatic music transcription and separation of audio sources.

**Wednesday June 27th, 2001**

**SOCO 2001: 'Fuzzy Sets I'**

**Time: 15.30-16:50 hrs**

- 15:30 hrs #1824-040  
'A Fuzzy Logic Framework for Testing Vague Hypotheses with Empirical Data'  
Dr. Martin Holeña, Institute of Computer Science, Czech Republic
- 15:50 hrs #1824-046  
'A Fuzzy Aggregation-Based Reputation Model for e-Learning Exploitation of Public Domain Resources'  
Dr. Juan Manuel Dodero\*, M.A.S. Urban\*, E.G. Barriocanal\*\*  
Carlos III University and iSOCO Madrid\*, Alcala University\*\*, Spain
- 16:10 hrs #1824-050  
'Fading Rate Based Adaptive Fuzzy Power Control for WCDMA Cellular Systems'  
Dr. Tapio Frantti, Technical Research Center of Finland, Finland  
P. Mähönen, University of Oulu, Finland
- 16:30 hrs #1803-066  
'An application of fuzzy expert systems to strategic investments: The case of Florim S.p.a.'  
Dr. Gisella Facchinetti, C.A. Magni, G. Mastroleo, M.Vignola  
University of Modena e Reggio Emilia, Italy

**Wednesday June 27th, 2001**

**Poster Session SOCO 2001**

**Time: 15:00-15:30 hrs**

#1824-006

'Computation of Geodesic Paths on Curved Surfaces Using Evolutionary Algorithms: A Comparative Evaluation'

Mr. Feng Xue, B.Porter

University of Hong Kong, Hong Kong

#1824-013

'A Neural-Fuzzy Classifier for Pattern Recognition with Uncertain Distributions'

Dr. Jiansheng Huang, Edith Cowan University, ML Campus, Australia

M. Negnevitsky, D.T. Nguyen

University of Tasmania, Australia

#1824-028

'International Soft Computing: Soft Information Infrastructures as Membranes'

Dr. Elia Chepaitis, Fairfield University, USA

#1824-029

'Estimating the Burden Distribution in the Blast Furnace with a Hybrid Model'

Mr. Jan Hinnelä, Rautaruukki Steel Oy and Åbo Akademi University, Finland

Henrik Saxén, Åbo Akademi University, Finland

#1824-037

'Steel slab temperature modelling using neural- and Bayesian networks'

Dr. Perttu Laurinen\*, J. Röning\*, H. Tuomela\*\*

\*University of Oulu, Finland \*\*Rautaruukki Steel, Finland

#1823-081

'Dynamic Pattern Recognition Using A Chaotic Neural Network'

Dr. Nigel Crook, Tjeerd Olde Scheper

Oxford Brookes University, UK

#1824-134

'Probabilistic Models of Canonical Correlation Analysis'

Dr. Zhenkun Gou, Colin Fyfe

The University of Paisley, Scotland, U.K.

**Thursday June 28th, 2001**

**Plenary Speech**

**Time: 9:00 – 10:00**

**‘Management of Information in Complex Systems’**

**by Prof. Edward Szczerbicki**

The University of Newcastle, Newcastle, Australia

**Biography**

Professor E Szczerbicki has had very extensive experience in the theory of autonomous multiagent systems analysis, and decision support systems development over an uninterrupted 24 year period, ten years of which he spent in the top systems research centers in the USA, UK, Germany and Australia. He has published over 150 refereed papers, 97 of which appeared in international journals covering the area of systems science, decision support, and multi-agent systems modeling and simulation. His DSc degree (1993), was gained in the area of information flow for multiagent systems. His PhD (1983) was gained in uncertainty modeling for design and MSc (1976) in engineering management. He is currently with the University of Newcastle, Newcastle, Australia where his present research covers modelling support for concurrent engineering and information theory for complex systems.

**Abstract**

Engineering, operations research, and management science use scientific and engineering processes to design, plan, and schedule increasingly more complex industrial systems in order to enhance performance. One can argue that the systems have grown in complexity over the years mainly due to increased strive for resource optimization combined with a greater degree of uncertainty in the system’s environment. Information is seen as one of the main resources that managers try to use in an optimal way. Managing complex systems requires a greater understanding and knowledge about the role of information in systems operation. Today, a *growing complexity of information flow* is a characteristics of enterprises which concerns products to be manufactured, services to be offered, processes and company structures. Complex systems also operate in *changing environments* surrounded by numerous *uncertainties* and *disturbances*. Difficulties arise from unexpected tasks and events and from a multitude of possible failures and other interactions during the attempt to control various activities in dynamic environments. Therefore, management of information is one of the most important aspects to be considered in intelligent management systems, which are expected to solve unforeseen problems, even on the basis of incomplete and imprecise information. The paper discusses the importance of information in operation management as well as new challenges in information modelling, visualisation and communication in information society.

**Thursday June 28th, 2001****Workshop****‘Artificial Neural Networks in Pattern Recognition’ (ANN 2001)****Organizer:** Prof. Juan M. Corchado, Spain**Time:** 10.45-15:00 hrs**Description**

The workshop is intended to bring together researchers from the fields of artificial neural networks, and other fields such as statistics, data analysis and all other domains connected with ANN and pattern recognition. The workshop is devoted to recent advances the field of pattern recognition and with special interest to application of artificial neural networks specialised in this type of problems.

We have solicited contributions covering all aspects: theory, methods, implementation and recent experimental results. The workshop will feature oral presentations and many opportunities for exchanges and informal discussions.

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|-----------|---|
| 10:45 hrs | Introduction<br>Juan Corchado<br>University of Salamanca, Spain   |
| 11:00 hrs | #1823-115<br>‘Estimation of the Ophthalmic Revision Period for Diabetic Patients Using Neural Networks’<br>Dr. Teodoro Calonge Cano*, L. Alonso Romero**, M.I. López Gálvez*<br>*University of Valladolid, Spain, **University of Salamanca, Spain                      |
| 11:20 hrs | #1823-116<br>‘Modelling the Biological Phenomenon of the Red Tides’<br>Dr. F. Díaz, F. Fernandez- Riverola, J.M. Torres, M.M.Sacau<br>University of Vigo, Spain   |
| 11:40 hrs | #1823-117<br>‘A Performance Study of the Constructive Neural Networks in a Classification Problem’<br>Dr. C.E. Vivaracho*, L. Alonso**, J. Ortega***, Q.I. Moro*<br>*Universidad de Valladolid, **Universidad de Salamanca, ***Universidad Politecnica de Madrid, Spain |
| 12:00 hrs | #1823-118<br>‘Neural Network Approach to Gun and Ammunition Recognition’<br>Dr. Angelica G. Arrieta*, L. Alonso Romero*, A.L.S. Lázaro*, J.M. del Amo**<br>*University of Salamanca, Spain, **Escuela General de Policia, Spain   |
| 12:20 hrs | #1824-119<br>‘Applying Simple Combining Techniques with Artificial Neural Networks to some Standard Time Series Classification Problems’<br>Dr. Isaac Q. Moro, C. Alonso González, J.J. Rodríguez Diez<br>University of Valladolid, Spain                               |
| 12:45 hrs | Lunch break   |

- 14:00 hrs #1824-120  
'A Multi Step Weather Forecast on a Horizon of 24 Hours Using Partial Recurrent Artificial Neural Networks and Local Data'  
Dr. Isaac Q. Moro\*, C.E. Vivaracho Pascual\*, L. Alonso Romero\*\*  
\*University of Valladolid, Spain \*\*University of Salamanca, Spain
- 14:20 hrs Concluding discussions
- 15:00 hrs End of workshop

**Thursday June 28th, 2001****Invited Session****‘Current Trends in Evolutionary Computation to Face Scheduling Problems’****Organizer: Prof. Raul Gallard, Argentina****Time: 09.30-12.50 hrs****Contents**

The general scheduling problem.

Schedule classes: nondelay, active and semiactive. Performance measures: Completion Time, Flowtime, Lateness, Tardiness, Earliness. Objective functions to optimize: makespan, weighted flowtime, weighted lateness, weighted tardiness, weighted number of tardy jobs, weighted early-tardy jobs. Maximum flowtime, maximum lateness and maximum tardiness. Restrictions: release dates, due dates, preemptions, sequence dependent set up times. Machine environments: Single machine, Parallel machines Flow shop and Job shop.

Improved Evolutionary Algorithms.

Introduction to a multiplicity feature in evolutionary algorithms. Evolution of the multiplicity feature. Multiple crossovers per couple (MCPC). The latest multirecombinative approach: Multiple crossovers on multiple parents (MCMP). Hybridization: evolutionary algorithms and local search.

Applications of MCPC and MCMP in single single machine, parallel machines flow shop and job shop scheduling problems. Single and and multiobjective optimization

Parallel evolutionary algorithms.

Their application to scheduling problems.

9:30 hrs Introduction by Raul Gallard

9:45 hrs #1824-090  
‘Breeding in Multirecombined Evolutionary Algorithms With Permutation Based Representation For The Job Shop Scheduling Problem’  
Prof. Raul H. Gallard, National University of San Luis, Argentina  
C. Salto, H. Alfonso, National university of La Pampa, Argentina

10:05 hrs #1824-091  
‘Evolutionary Algorithms And Local Search to Solve Scheduling Problems’  
Prof. Raul H. Gallard, National University of San Luis, Argentina  
C. Salto, H. Alfonso  
National university of La Pampa, Argentina

10:25 hrs #1824-092  
‘A Study of the Influence of the Genetic Operators in Evolutionary Algorithms When Solving the Flow Shop Scheduling Problem’  
Prof. Raul H. Gallard, S. C. Esquivel, F. Zuppa  
National University of San Luis, Argentina

10:45 hrs #1824-093  
‘Using the Stud in Multiple Parents for the Flow Shop Scheduling Problem’  
Prof. Raul H. Gallard, S. C. Esquivel, F. Zuppa  
National University of San Luis, Argentina

- 11:05 hrs #1824-094  
'Hybrid Multi-Inver-Over Evolutionary Algorithms for the Euclidean Travelling Salesman Problem'  
Prof. Raul H. Gallard, National University of San Luis, Argentina  
G. Minetti, H. Alfonso  
National University of La Pampa, Argentina
- 11:25 hrs #1824-095  
'Parameter Setting in Evolutionary Algorithms for Multiobjective JSSP Optimization'  
Prof. Raul H. Gallard, S.C. Esquivel, S.W. Ferrero  
National University of San Luis , Argentina
- 11:50 hrs #1824-096  
'Alternative Recombination Methods in Evolutionary Algorithms for the Task Scheduling Problems'  
Prof. Raul H. Gallard, S.C. Esquivel, C.R. Gatica  
National University of San Luis, Argentina
- 12:10 hrs #1824-097  
'Multiple Recombination and Breeding in Evolutionary Algorithms for the Flow Shop Scheduling Problem'  
Prof. Raul H. Gallard, National University of San Luis, Argentina  
G. Vilanova, D. Pandolfi, M. De San Pedro, A. Villagra  
National University of La Patagonia Austral, Argentina
- 12:30 hrs #1824-098  
'Multirecombining Studs and Immigrants in Evolutionary Algorithm to Face Earliness-Tardiness Scheduling Problems'  
Prof. Raul H. Gallard, National University of San Luis, Argentina  
G. Vilanova, D. Pandolfi, M. De San Pedro, A. Villagra  
National University of La Patagonia Austral, Argentina

**Thursday June 28th, 2001****SOCO 2001: 'Expert Systems'****Time: 10.45-12:25 hrs**

- 10:45 hrs #1824-061  
'Meta- Combiner of Unknown-Attribute-Values Processing Classifiers: Meta-CN4'  
Dr. Ivan Bruha  
McMaster University, Canada
- 11:05 hrs #1823-101  
'CBR Reuse Model'  
Dr. Fransisco Jose Garcia Penalvo\*, J.M. Corchado\*, M.A. Laguna\*\*,  
J.M. Marqués\*\*  
\*University of Salamanca, Spain, \*\*University of Valladolid, Spain
- 11:25 hrs #1824-103  
'A Recognition System for Unconstrained Handwritten Thai Alphabets'  
Mr. Sarrachai Taechotanon, J. Kamolchol, T. Tanprasert  
Assumption University, Tailand
- 11:45 hrs #1823-121  
'Combined Intelligent P D Analysis of High Voltage Dielectric Condition Evaluation'  
Mr. Nigel Bish\*, P.A. Howson\*, R.J. Howlett\*, T.J. Fawcett\*\*, D.A. Hilder\*\*  
\*University of Brighton, UK \*\*Robinson Instruments, Cheshire, UK
- 12:05 hrs #1823-122  
'The Extension of Software Metrics in Different Software Paradigms'  
Prof. Meer Hamza, A.B. Mohamed  
Arab Academy for Science and Technology, Egypt

**Thursday June 28th, 2001**

**SOCO 2001: 'Fuzzy Sets II'**

**Time: 10.45-12:05 hrs**

- 10:45 hrs #1824-062  
'On Comparison of Fuzzy Values'  
Dr. Vishv Malhotra  
University of Tasmania, Australia
- 11:05 hrs #1823-085  
'Increasing the Performance of the Fuzzy Controller with an Adaptive Similarity Factor'  
Prof. Antonio Dourado Correia, M. Jose, J. Henriques  
Polo II - Universidade de Coimbra, Portugal
- 11:25 hrs #1824-102  
'A New Approach on Fuzzy Identification for MISO Nonlinear Systems'  
Dr. Ping Wong Wong, L.F. Yeung  
City University of Hong Kong
- 11:45 hrs #1823-108  
'Relativity-based dynamic evaluation model for fuzzy decision making'  
Dr. Jinnig Peng\*, M.R. Jackson\*, R.M. Parkin\*, B. Chen\*\*  
\*Loughborough University, UK, \*\*Tsinghua University, P.R. China

**Thursday June 28th, 2001**

**Poster Session ISFI 2001**

**Time: 10:15-10:45 hrs**

#1812-001

'New Method for Change Detection in Systems Operating in Nonstationary Environment'

Prof. Theodor D. Popescu

National Institute for Research & Development in Informatica, Romania

#1814-016

'The Application of Artificial Intelligence Techniques to Quality Evaluation'

Dr. Edson Pacheco Paladini

Federal University of Santa Catarina, Brazil

#1803-019

'Analysis of Rate-Based Congestion Control in ATM Switching Networks'

Dr. Liansheng Tan\*, S.H. Yang\*\*, M. Yin\*, F. Zhao\*

\*Central China Normal University, China, \*\* Loughborough University, UK

#1813-035

'Knowledge Discovery in Databases in an Intelligent Decision Support Context: A meteorological forecasting case study'

Dr. Sérgio Ivan Viademonte da Rosa\*, F. Burstein\*, R. Dahni\*\*, S. Williams\*\*

\*Manash University, Australia, \*\*Bureau of Metereology, Australia

#1813-058

'Implicit knowledge structures of court personnel: A decision support system for juvenile detention decisions'

Ph.D. Tim Brennan, Colorado University, USA

#1813-075

'Logical Formal Description of Expert Systems'

Dr. M. de la Sen, J.J. Minambres, A.J. Garrido

University of Basque Country, Spain

#1813-087

'The Study and Application of Neural Network-Based Adaptive Inverse Control'

Mr. Hailin Zhang, P.Han, L.Zhou

North China Electric Power University, China

**Thursday June 28th, 2001****SOCO 2001: 'Neural Networks I'****Time: 14:00-15:40 hrs**

- 14:00 hrs #1824-020  
'A Fuzzy Sensor Validation System for Plasma Density Measures in Tokamak Machines based on Neural Models'  
Dr. Maria Gabriella Xibilia, University of Messina, Italy  
G. Bucetti\*, A.Gallo\*\*, A. Rizzo\*\*  
\* ENEA, Italy, \*\* University of Catania, Italy
- 14:20 hrs #1824-045  
'Approximating Value Functions with Networks of Radial Basis Functions'  
Dr. Thibault Langlois  
Instituto Superior Técnico / INESC, Portugal
- 14:40 hrs #1824-065  
'ARTD: An Autonomous Recursive Task Decomposition Approach to Many- Class Learning'  
Dr. Davide Roverso, Institutt for Energiteknikk, Norway
- 15:00 hrs #1823-079  
'On the Basin of Optimal Points Appearing in Neural Networks for Combinatorial Optimization Problems'  
Prof. Yoshinori Uesaka  
Science University of Tokyo, Japan
- 15:20 hrs #1824-107  
'Derivation of Average Generalization Error and Learning Curve'  
Prof. Hiroki Suyari, I. Matsuba  
University of Chiba, Japan

**Thursday June 28th, 2001****ISFI 2001: 'Rules and Experts'****Time: 14:00-15:40 hrs**

- 14:00 hrs #1813-106  
 'Assessment and Selection of Intelligent System techniques in the Nuclear Industry'  
 Dr. Lesley A. Martin\*, J.A. Steele\*, S.D.J. McArthur\*, A. Moyes\*, J.R. McDonald\*, D. Howie\*\*, R. Elrick\*\*\*, I.Y. Yule\*\*\*\*  
 \*University of Strathclyde, Glasgow, \*\*British Energy Generation (UK) Limited, East Kilbride, UK, \*\*\* British Energy Generation (UK) Limited, Gloucester, UK, \*\*\*\* British Energy Generation (UK) Limited, Torness Power Station, East Lothian, UK
- 14:20 hrs #1814-024  
 'Information Based Integration for Autonomous Manufacturing Systems'  
 Prof. Edward Szczerbicki  
 University of Newcastle, Australia
- 14:40 hrs #1813-060  
 'Soft Computing and Fault Management'  
 Dr. Roy Sterritt  
 University of Ulster at Jordanstown, Northern Ireland
- 15:00 hrs #1814-072  
 'Employing Information Hidden in Industrial Process Data'  
 Dr. Pavel Ettler. Compureg Plzen, s.r.o., Czech Republic  
 M. Kárny, I. Nagy  
 Institute of Information Theory and Automation AV CR, Czech Republic
- 15:20 hrs #1813-076  
 'Some Theoretical Formalism for Expert Systems. An application to the Improvement of the Adaptation Transients'  
 Dr. M. de la Sen\*, J. J. Minambres\*, A.J. Garrido\*, A. Almansa\*\*, J.C. Soto\*  
 \*University of Basque Country, Spain, \*\*Robotiker Co. Parque Tecnológico, Spain,

**Friday June 29th, 2001**

**Plenary Speech**

**Time 09:00 – 10:00**

**‘Non-linear Techniques in Speech Processing’**

**by Dr. Amir Hussain**

University of Stirling, United Kingdom

**Abstract**

There has recently been a growing interest in the use of non-linear speech-processing techniques for improving the voice-services related to telecommunications systems. This interest is motivated by the belief that non-linear technology will allow some future voice telecommunication services, not available today. New technologies based on non-linear processing are hoped to provide higher quality speech synthesis, more efficient speech coding, improved speech recognition, and improved speaker identification and verification. Non-linear methods can also contribute significantly to the acceptance of voice interfaces for information systems such as the mobile Internet (by improved synthesis and recognition). Furthermore, such methods can lead to improved efficiency in future generations of speech coders used in wireless networks, including packet-based wireless networks. This talk will give an overview of recent developments aimed at evaluating the potential for performance improvement of practical speech-processing applications through the use of non-linear techniques.

**Friday June 29th, 2001**

**SOCO 2001: 'Neural Networks II'**

**Time: 10:45-12:05 hrs**

- 10:45 hrs #1824-017  
'Structural Stabilization of Cellular Neural Networks'  
Dr. Evgeny E. Dudnikov  
International Research Institute for Management Sciences, Russia
- 11:05 hrs #1823-031  
'Complex concept detection system based on unsupervised learning neural networks'  
Prof. Clara Pérez Molina, Carlos de Mora  
ETSII-Spanish Distance Learning University, Spain
- 11:25 hrs #1823-049  
'Rectified Gaussian Distributions and the Identification of Spatiotemporal Structure in Video Data'  
Dr. Emilio Corchado, D. Charles, C. Fyfe  
Paisley University, Scotland, UK
- 11:45 hrs #1823-112  
'A Comparative Study of Mixtures of Principal Component Analysis Forecasts and Factor Analysis Forecasts'  
Prof. Dr. Ying Han, Colin Fyfe  
University of Paisley, UK

**Friday June 29th, 2001****ISFI 2001: 'Artificial Neural Networks'****Time: 10:45-12:05 hrs**

- 10:45 hrs #1813-042  
 'Optimal 3½/2-Axis CNC Machining of Sculptured Parts Using Fuzzy Pattern Clustering'  
 Prof. Z. Dong, G.W. Vickers  
 University of Victoria, Canada
- 11:05 hrs #1813-086  
 'Analysis of the construction of a new fast system to solve VRPTW problems, based on Simulated Annealing'  
 Dr. Olatz Arbelaitz, C. Rodriguez, I. Zamakola  
 Informatika Fakultatea, Spain
- 11:25 hrs #1813-105  
 'Interpretation of Nuclear Refuelling Process Monitoring Data using Intelligent Systems'  
 Dr. Jason A. Steele\*, Dr. Lesley A. Martin\*, S.D.J. McArthur\*, A. Moyes\*,  
 J.R. McDonald\*, D. Howie\*\*, R. Elrick\*\*\*, I.Y. Yule\*\*\*\*  
 \*University of Strathclyde, Glasgow, \*\*British Energy Generation (UK) Limited, East  
 Kilbride, UK, \*\*\* British Energy Generation (UK) Limited, Gloucester, UK, \*\*\*\*  
 British Energy Generation (UK) Limited, Torness Power Station, East Lothian, UK
- 11:45 hrs #1813-111  
 'Product Estimation Using Artificial Neural Networks on Reconfigurable Analogue Devices'  
 Dr. Raul R. Leal Ascencio\*, C.A. Galicia\*, E. Herrera\*\*  
 \*ITESO, Mexico, \*\*CIATEJ, Mexico

**Friday June 29th, 2001**

**SOCO 2001: 'Neural Networks III'**

**Time: 14:00-15:20 hrs**

- 14:00 hrs #1824-007  
'A Hybrid Time Lagged Network for Predicting Asian Stock Prices'  
Prof. Ma Tit Yap, S.C. Hui  
Nanyang Technological University, Singapore
- 14:20 hrs #1824-015  
'Comparing Mean Field and Exact EM in Tree Structured Belief Networks'  
Mr. Nicholas Adams, C.K.I. Williams, A.J. Storkey  
University of Edinburgh, UK
- 14:40 hrs #1824-036  
'Data Editing For Neuro Fuzzy Classifiers'  
Dr. Bogdan Gabrys  
University of Paisley, Scotland, U.K.
- 15:00 hrs #1824-044  
'Products and Sums of Tree-Structured Gaussian Processes'  
Dr. Chris Williams, S. N. Felderhof  
University of Edinburgh, Scotland

**Friday June 29th, 2001****SOCO 2001: 'Evolutionary Algorithms'****Time: 14:00-15:40 hrs**

- 14:00 hrs #1824-012  
'An Intelligent Hybrid Method for Computing Reactive Power Margin of Power Systems under Variant Operating Conditions'  
Dr. Jiansheng Huang, Edith Cowan University, ML Campus, Australia  
C.S. Chang A.C. Liew  
The National University of Singapore, Singapore
- 14:20 hrs #1824-041  
'Accurate Face Extration And The Pose Detection Using Subspace Method And Genetic Algorithm'  
Dr. Makoto Murakami, M. Yoneyama, K. Shirai  
Waseda University, Japan
- 14:40 hrs #1824-047  
'Adaptive Parameterization of Evolutionary Algorithms and Chaotic Artificial Populations'  
Dr. Stefano Pizzuti, M. Annunziato  
ENEA - Casaccia Research Centre, Italy
- 15:00 hrs #1824-053  
'Gait Evolution for a Hexapod Robot'  
Dr. Gary Parker, K. Larochele, Sarah Dashnaw  
Connecticut College, USA
- 15:20 hrs #1823-055  
'Evolutionary Optimisation of Decision Rules in the Control of Production-Distribution Systems with Competitive Manufacturers'  
Dr. Kwok Tung Ling, B.Porter  
University of Hong Kong, Hong Kong