International NAISO Congress on

INFORMATION SCIENCE INNOVATIONS

ISI'2001
March 17-21, 2001
at the American University in Dubai, U.A.E.

ISI'2001 is under the Honorary Patronage of

H.H. The Crown Prince of Dubai

Sheikh Mohammed Bin Rashed AL Maktoum
Defense Minister of UAE

International NAISO Congress on

INFORMATION SCIENCE INNOVATIONS

Clinical Trials (CT'01)
E-Business and Beyond (EBB'01)
Intelligent Automated Manufacturing (IAM'01)
Engineering of Natural and Artificial Intelligent Systems (ENAIS'01)
Intelligent Quality Management and Metrology (IQMM'01)

March 17-21, 2001

American University in Dubai
Dubai, U.A.E.

ICSC
International Computing Sciences Conventions
Canada/ The Netherlands

Directory

Preface

Welcome to ISI'2001!

The explosive growth of the world wide web and its universal acceptance by society has irrevocably changed the computing landscape. For the first time in the history of computing, the typical user of a computer neither knows nor needs to know very much about how a computer works in order to use it. The resulting radically new computing world is becoming apparent to more and more users, and Information Technology (IT) is forcing its way to almost every field and business. As a result, IT is blooming as a separate field by itself, dealing with computer applications over international or local networks. The main concern of IT professionals is the user's interaction and satisfaction with the computing world.

On the other hand, traditional fields of Computer Science and Engineering concentrated more on how the computers work from inside, and how to improve and evolve computing processes and methodologies in order to increase the computer's intelligence. In order to enhance the computer's intelligence, researchers are trying to mimic the natural intelligence of the human brain, as well as the natural individual and social behavior. Obviously, increasing the computer's intelligence will ease the interaction between the user and the entire computing world.

While Computer Science and Engineering research is conducted widely by researchers and scholars coming from universities, industries and other institutions, IT developments are still controlled by few companies worldwide. As more intelligence and flexibility is needed in IT applications, a major breakthrough in this field might not happen unless advanced theories and methodologies of Computer Science and Engineering are injected into the main ingredients of the IT environments, to provide a strong theoretical backup for these environments.

This merge between Computer Science and Engineering, on one hand, and Information Technology, on the other, is what we call "Information Sciences", which is chosen to be the title of this congress. It is intended to target themes related to different IT components (software, hardware, networking, data administration) used for different applications (medicine, business, manufacturing, software development) with a strong computer science and engineering background. It is a contribution from researchers in the field in drafting the future of the currently starting Information Era in order not to leave this role to few companies and groups.

The congress will concentrate on five main themes divided over four symposia: IT innovations in Clinical Trials, E-Business and Beyond, Intelligent Manufacturing Automation, Engineering of Natural and Artificial Intelligent Systems, and Intelligent Quality Management and Metrology.

Milad Fares Sebaaly, Dr. Eng.
ISI'2001 General Chair,
Chairman and Assistant Professor,
Department of Information Technology
American University in Dubai
P.O. Box: 28282, Dubai, U.A.E.

Chairs and Committees

Honorary Chair
Prof. Lotfi A. Zadeh, Professor in the Graduate School, Computer Science Division, Department of Electrical Engineering and Computer Sciences
University of California, Berkeley, USA
zadeh@cs.berkeley.edu

General Chair
Dr. Milad Fares Sebaaly, UAE
Chairman and Assistant Professor of Information Technology at the American University in Dubai, Dubai, United Arab Emirates
msebaaly@aud.edu

General Vice-Chair
Prof. Hans-Heinrich Bothe, Denmark
Technical University of Denmark, Denmark

Publication Chair
Prof. Jihad Nader, UAE
American University in Dubai, United Arab Emirates

Congress Organizer
NAISO - Natural and Artificial Intelligence Systems Organization

NAISO / ICSC Planning Division
Wetaskiwin, Alberta / Canada
planning@icsc.ab.ca

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International Program Committee

CT'01
Eduardo Massad, Brazil (Symposium Chair)

International Scientific Committee:
J. Bernardo, Spain - G. M. Bohm, Brazil - R. Brause, Germany - S. S. Cross, UK - B. De Faria Leao, Brazil - C. De Silva, Netherlands - M. Harrison, New Zealand - A. Hussain, UK - H. Ihara, Japan - N. Jayaram, UK - I. A. Karadiaris, USA - P. Keller, USA - R. Kikinis, USA - I. Kohane, USA - P. Kokol, Slovenia- A. Kusiak, USA - F. Naghdy, Australia - R. Norman, USA - L. Ohno-Machado, USA - M.Pearcy, Australia - M. Rehani, India - E. Sanchez, France - P. Schotsmans, Belgium-
M. Somerville, Canada - R. Stozka, Germany - P. Szcsepaniak, Poland - K. K. Tan, Singapore - V. Thomas, Germany - D. Wilson, Canada - D. Zelterman, USA

EBB'01
Peter Aiken, USA (Symposium Chair)
Amir Hussain, UK (Symposium Vice Chair)

International Scientific Committee:
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IAM'01
Kathryn Stecke (Symposium Chair)
Toshio Fukuda (Symposium Vice-Chair)
Ashok Kumar (Symposium Vice-Chair)

I. Al-Bahadly, New Zealand - P. Braiden, UK - R. Caprihan, India - R. De Keyser, Belgium - A. Dobnikar, Slonvenia - I. Dudas, Hungary - O. Gusikhin, USA - A. Hussain, UK - Z. Irani, UK - O. Khatib, USA - T. Koltai, Hungary - A. Kusiak, USA - P. Luh, USA - V. Majstorovic, Yugoslavia - J. McGhee, UK - F. Mrad, Lebanon - F. Naghdy, Australia- S. Nahavandi, Australia - H. Nicholls, New Zealand - B. Porter, Hong Kong - N. Raman, USA - A. Saffiotti, Sweden - A. Sage, USA - E. Sanchez, France - A. Smirnov, Russia - T. Sobh, USA - N. Suresh, USA - E. Szczerbicki, Australia - K. K. Tan, Singapore - T. Tarn, USA - H. Tolle, Germany - K. Turowski, Germany - R. Villas-Boas, Brazil - T. Watanabe, Japan - H. Woern, Germany - U. Zimmer, Japan - M. Zribi, Kuwait

ENAIS'01
Peter G. Anderson (Symposium Chair)

International Scientific Committee:
J. Akoka, France - I. Aleksander, UK - F. Chedid, Lebanon - A. Cichocki, Japan - P. Daponte, Italy - C. DeSilva, Australia - A. Dobnikar, Slovenia - M. Dorigo, Belgium - W. Dubitzky, Germany - C. Fyfe, UK - R. Gaborski, USA- U. Halici, Turkey - D. Hamad, France - H. Hellendoorn, Netherlands - B. Howlett, UK - A. Hussain, UK - P. Keller, USA - O. Khatib, USA - R. Kowalczyk, Australia - L. Kuncheva, UK - A. Kusiak, USA - F. Mrad, Lebanon - F. Naghdy, Australia - N. Marichal Plasecia, Spain - V. Podgorelec, Slovenia - B. Porter, Hong Kong - S. Potter, USA - A. Saffiotti, Sweden - E. Sanchez, France - A. Sfeir, Lebanon - P. Sincak, Slovakia - T. Sobh, USA - B. Stilman, USA - B. Stotzka, Germany - E. Szczerbicki, Australia - P. Szczerpanial, Poland - K. K. Tan, Singapore - H. Tolle, Germany - T. Villmann, Germany- A. Weingessel, Austria - U. Zimmer, Japan

IQMM'01
P. Herbert Osanna (Symposium Chair)
Albert Weckenmann (Symposium Co-Chair)
Ken Stout (Symposium Vice Chair)

International Scientific Committee:
J. Akoka, France - O. Aumala, Finland - D. Barschdorf, Germany - N. Brown, Australia - Y. Chuguy, Russia - L. Cser, Hungary- P. Daponte, Italy - A. Dobnikar, Slovenia - W. Dubitzky, Germany - M. N. Durakbasa, Austria - W. T. Estler - K. Hoffmann, Austria - B. Howlett, UK - A. Hussain, UK - R. Jablonski, Poland - C. P. Keferstein - A. Leitner, Austria - J. Leopold - P. Kopacek, Austria - V. Majstorovic, Yugoslavia - J. McGhee, UK - L. Monostori, Hungary - V. Mudronja, Croatia - T. Ono, Japan - V. Radhakrishnan, India - E. Seiler, Germany - P. Skalicky, Austria - K. K. Tan, Singapore - B. Zagar, Austria - S. Zahwi, Egypt

NAISO – Natural and Artificial Intelligence Systems Organization

Who is NAISO ?

The 'Natural and Artificial Intelligence Systems Organization' (NAISO) was recently founded and is presided by Professor Witold Pedrycz, University of Alberta, Edmonton, Canada. The objectives of NAISO are the encouragement of efficient communication between scientists, researchers, engineers and practitioners in the field of natural and artificial intelligence systems. The promotion of interaction between research and industry worldwide is one of the principal aims. NAISO will meet these objectives by the arrangements of international conventions, conferences, mini-tracks and workshops.

The promotion of interaction between research and industry worldwide is one of the principal aims. NAISO will meet these objectives by the arrangements of international conventions, conferences, minitracks and workshops. NAISO is represented by its International Academic Council (IAAC), designed as a source of academic guidance and active support for future projects.

NAISO Academic Advisory Board

Igor Aleksander, Imperial College of Science & Technology, London, U.K.
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Lotfi A. Zadeh, University of California, Berkeley, CA, USA (Honorary IAAC member)
Uwe R. Zimmer, GMD - Japan Research Laboratory, Japan
Hans- Juergen Zimmermann, RWTH- Aachen, Gemany

General Information

Conference Location

American University in Dubai
P.O. Box 28282
Dubai
Tel: + 971-4-3999000

General Information about Dubai

Dubai is very liberal. There are no restrictions whatsoever on the style of dressings or behaviour, as long as it is within the normal western standards.
Dubai is the second largest Emirate in the United Arabian Emirates and home to over half a million people. Located midway between Europe and the Far East it boasts a strong multicultural environment, luring residents and travelers from all corners of the world. The capital city, also called Dubai, is a booming metropolis that has been strongly influenced by its fishing and trading roots. Dubai is currently a business/trade hub for the entire region from South Africa to CIS countries, and from Morocco to the Indian subcontinent.
Dubai's main industries include modern petroleum, petrochemical and construction materials industries, as well as boat building, traditional handicrafts and pearling.
The currency used in Dubai is the Emirian Dirham (Dh) and money may be exchanged at various banks and exchange houses throughout the emirate.
Average temperatures range from 40 C in summer months (May - September) to 10 C during winter months. Wind may be brisk at times and one may need a windbreaker or warm sweater.

Registration at the Conference Site

Please note that all participants must contact the registration/hospitality desk upon arrival. Please register as early as possible to avoid rush prior to the opening session.

The desk will be staffed at the following times:

Friday, 16 March	: 18.00 – 20.00 hrs
Saturday, 17 March	: 09.00 – 18.00 hrs
Sunday, 18 March	: 09.00 – 13.00 hrs / 14.00 – 18.00 hrs
Monday, 19 March	: 09.00 - 13.00 hrs
Tuesday, 20 March	: 09.00 – 13.00 hrs / 14.00 – 18.00 hrs
Wednesday, 21 March	: 09.00 – 13.00 hrs

Each participant will receive a full documentation at the conference.

General information

Paper Presentations

Please note that the scheduling of the presentations is final and that changes cannot be made without affecting many other speakers and listeners. Thank you for your cooperation.
Each paper will be presented by one of the authors. The speakers are requested to report to the session chairman in the assigned conference room not later than 10 minutes before each session starts.
The time assigned for each paper is 20 minutes (including 5 minutes for discussion). All speakers and session chairs must strictly adhere to the time schedule.
Conference language is English.
Each conference room is provided with an overhead projector for transparent films. For any further requirements, please contact the organizers prior to the congress.

Congress Proceedings

The congress proceedings are available at the conference either on CD-ROM or as printed edition. All papers presented at ISI'2001 are published in these proceedings. Additional copies are available from ICSC Academic Press
Publication by ICSC Academic Press, Canada/ The Netherlands

ISBN 3-906454-25-8

Selected papers will be considered for publication in leading international journals

Further Scientific Publications

A wide range of proceedings from other ICSC/NAISO conferences is available.
Please consult the following website:
http://www.icsc-naiso.org

Social Program

Saturday, March 17:	Welcome cocktail at the conference site
Sunday, March 18:	ISI'2001 Conference dinner
Monday, March 19:	Desert Safari (optional, not included in registration fee)

Congress Schedule

Congress Schedule (March 17, 2001)

Schedule Saturday, March 17, 2001

9:00 - 18:00 hrs	Registration at conference site
11:00 - 11:15 hrs	Coffee Break
12:55 - 14:00 hrs	Lunch Break
16:00 - 16:15 hrs	Coffee Break

Workshops

09.00 – 11.00 hrs	'Mechatronics: Research, Education and Industrial Applications' (MREIA'2001) Organized by Professor Yousef Ibrahim, Australia (for details see page 21)
09.00 – 18.00 hrs	'Information Systems for Mass Customization' (ISMC'2001) Organized by Prof. Dr. Claus Rautenstrauch and Dr. Klaus Turowski (for details see page 22-23)
09:00 - 18:00 hrs	FIRA-ISI2001 Robot-Soccer Workshop Organizer: FIRA, Federation of International Robot-Soccer Associations (for details see page 24)
14.00 – 18.00 hrs	'Document Image Alalysis and Understanding' (DIAU'2001) Organized by Dr. George Thoma, Daniel X. Le, Daniel Lopresti and Thomas Kailath (for details see page 28)

Tutorials

09.00 – 12.55 hrs	'Effective Anthropometry' by Kathleen Robinette, USA and Eric Paquet,Canada (for details see page 25)
09.00 – 12.55 hrs	'Information Security Management According to International Best Practices' by Basie von Solms (for details see page 26)
14.00 – 17.55 hrs	'Improving Evolutionary Algorithms Performance through Multi-Recombination and Parallelism' by Raul Gallard (for details see page 27)

Opening Ceremony

18:00 - 20:00 hrs	Opening Ceremony Congress General Chair AUD Representative NAISO Representative DIC Representative H.H. Sheikh Mohammed's Representative (or himself if possible) Keynote Speech by Prof. H.-J. Zimmerman 'Intelligent Methods in Engineering and Management Present and Future' (for details see page 29)
20:00 to 22:00 hrs	Welcome Reception at the conference site

Congress Schedule (March 18, 2001)

Schedule Sunday, March 18, 2001

9:00 - 10:00 hrs	Keynote Speech by Prof. Igor Aleksander 'Emergence, Evolution and Depiction: The Next 50 years of Artificial Intelligence' (for details see page 30)
10:00 - 11:00 hrs	Keynote Speech by Dr. Steve Potter 'Interfacing Living Neuron to Computers', (for details see page 31)
11:00 - 11:15 hrs	Coffee Break
11:15 - 12:55 hrs	ISI'2001 Parallel Technical Sessions S 1.1: EBB E-Commerce (page 32) S 1.2: ENAIS Genetic and Evolutionary Algorithm Applications (page 33) S 1.4: IAM Capacity Planning and Scheduling in Flexible Manufacturing Systems (page 34) S 1.5: Invited Session CT, Tatjana Welzer (page 35) Robot Soccer Championships-Orientation (page 39)
11.15 – 17.55 hrs	Poster Sessions (for details see page 37-38)
11.15 – 17.55 hrs	Workshop 'Autonomous and Artificial Systems, Exploring Hostile Environments' (AASEHE'2001) by Prof. R. Pfeifer and Prof. U. Zimmer (for details see page 36)
12:55 - 14:00 hrs	Lunch Break
14:00 - 15:00 hrs	Keynote Speech by Prof. David Russell 'Graduate Education and E-Business' (for details see page 40)
15:00 - 16:00 hrs	Keynote Speech by Prof. Hans Bothe 'Physiologically Inspired Technical Neural Systems' (for details see page 41)
16:00 - 16:15 hrs	Coffee Break
16:15 - 17:55 hrs	ISI'2001 Parallel Technical Sessions S 2.2: ENAIS Applications 1 (page 42) S 2.3: IAM Quality Control and Robust Control in Flexible Assembly (page 43) S 2.4: IQMM Metrology 1 (page 44) S 2.5: Invited Session CT, Tatjana Welzer (page 45)
18:00 - 20:00 hrs	Break
20:00 - 22:00 hrs	ISI'2001 Conference Dinner

Congress Schedule (March 19, 2001)

Schedule Sunday, March 19, 2001

9:00 - 10:00 hrs	Keynote Speech by Prof. Zeugnam Bien 'Intelligent Methods for Human-Friendly Interaction/Interface applied for Intelligent Residential Systems' (for details see page 47)
10:00 - 11:00 hrs	Keynote Speech by Prof. Rolf Pfeifer 'Embodied Artificial Intelligence: Dynamics, morphology and materials in the emergence of cognition' (for details see page 48)
11:00 - 11:15 hrs	Coffee Break
11:15 - 12:55 hrs	ISI'2001 Parallel Technical Sessions

M 1.1: CT	Diagnostic Systems I (page 49)
M 1.2: EBB	E-Commerce (page 50)
M 1.3: ENAIS	Genetic and Evolutionary Algorithm Theory (page 51)
M 1.4: ENAIS	Fuzzy Sets and Logic, Theory and Applications (page 52)
M 1.5: IAM	Flexible Automation (page 53)
M 1.6: IQMM	Metrology 2 (page 54)
	Robot Soccer Championships-Preliminary Games- Group A (page 55)

12:55 - 14:00 hrs	Lunch Break
14.00 – 15.00 hrs	Keynote Speech by Prof. R. Wehner 'Ant navigation: mini brains – mega tasks-smart solutions' (for details see page 55)
15.00 - 16.00 hrs	Round table discussion in Dubai Internet City
16:15 - 22:00 hrs	Desert Safari (Optional)

Congress Schedule (March 20, 2001)

Schedule Tuesday, March 20, 2001

9:00 - 10:00 hrs	Keynote speech by Prof. Toshio Fukuda 'Intelligent System for System Integration' (for details see page 56)
10:00 - 11:00 hrs	Keynote speech by Prof. Phillipe Coiffet 'Virtual reality Problematics in Manufacturing' (for details see page 57)
11:00 - 11:15 hrs	Break
11:15 - 12:55 hrs	ISI'2001 Parallel Technical Sessions
	T 1.1: CT Medical Decisions (page 58) T 1.2: EBB Simulation and Virtuality (page 59) T 1.3: ENAIS Neural Network Theory (page 60) T 1.4: IAM Time Series and Diagnostics (page 61) T 1.5: Invited Session IQMM, Hans Juergen Leopold (page 62)
12:55 - 14:00 hrs	Lunch Break
14:00 - 15:00 hrs	Keynote Speech by Dr. Abdulla Mohammed 'Agents and Information Technology' (for details see page 63)
15:00 - 16:00 hrs	Keynote Speech by Prof. Jong-Hwan Kim 'Multi-Agent Robot Soccer System' (for details see page 64)
16:00 - 16:15 hrs	Break
16:15 - 17:55 hrs	ISI'2001 Parallel Technical Sessions
	T 2.2: EBB Computational (page 65) T 2.3: ENAIS Learning Systems (page 66) T 2.4: ENAIS Multi- agents Theory and Applications (page 67) T 2.5: IQMM Metrology 3 (page 68)
18:00 - 23:00 hrs	Robot Soccer Championships-Preliminary Games- Group B (page 69)

Congress Schedule (March 21, 2001)

Schedule Wednesday, March 21, 2001

9:00 - 10:00 hrs	Keynote Speech by Prof. Richard Normann 'Recent Advances in Neuroprosthetic Therapies: Artificial Vision' (for details see page 70)	
10:00 - 11:00 hrs	Keynote Speech by Prof. Hirokazu Ihara 'Dependable Bridge between Healthcare and Engineering' (for details see page 71)	
11:00 - 11:15 hrs	Coffee Break	
11:15 - 12:55 hrs	ISI'2001 Parallel Technical Sessions	
	W 1.2: EBB	Security & Intelligent Networking, Routing and Navigation (page 72)
	W 1.3: ENAIS	Neural Network Applications (page 73)
	W 1.4: IAM	Modelling Manufacturing Systems (page 74)
	W 1.5: IQMM	Intelligent Quality (page 75)
12:55 - 14:00 hrs	Lunch Break	
14:00 - 15:00 hrs	Keynote Speech by Prof. Erkki Oja 'Unsupervised learning for data and signal analysis' (for details see page 76)	
15:00 - 16:00 hrs	Keynote Speech by Dr. Atul Butte 'The New Clinical Research: using bioinformatics in patient care' (for details see page 77)	
16:00 - 16:15 hrs	Coffee Break	
16:15 - 17:55 hrs	ISI'2001 Parallel Technical Sessions	
	W 2.2: ENAIS	Applications 2 (page 78)
	W 2.3: ENAIS	Multi- agents Theory and Applications (page 79)
	W 2.4: IAM	Automation Issues (page 80)
	W 2.5: IQMM	Processes & Surface Inspection (page 81)
18:00 - 20:00 hrs	Robot Soccer Championship-Finals (page 82)	
20:00 - 22:00 hrs	Congress Awards/Closing Ceremony	

Saturday, March 17, 2001 (09.00-11.00 hrs.) Room B203

'Mechatronics: Research, Education and Industrial Applications' (MREIA'2001)
Workshop by Prof. Yousef Ibrahim, Australia

Presentation by Yousef Ibrahim

Paper #: 1693-235
Title: An Integrated Environment for Modeling, Simulation and Control of Harmonic Drive Systems
Authors: R. Dhaouadi
American University of Sharjah, Sharjah, United Arab Emirates

Paper #: 1643-147
Title: Multirecombination in Evolutionary Algorithms for Single and Multicrieria Optimization
Authors: R.H. Gallard, S.C. Esquivels
Universidad Nacional de San Luis, San Luis, Argentina

Paper #: 1633-240
Title: Mechatronics Development at the American University of Sharjah
Authors: M.A. Jarrah, Y. Al-Assaf, and A. R. Al-Ali
American University of Sharjah, Sharjah, United Arab Emirates

Saturday, March 17, 2001 (09.00-17.55 hrs.) Room B205

'Information Systems for Mass Customization' (ISMC'2001)
Workshop by Prof. Dr. Claus Rautenstrauch and Dr. Klaus Turowski

09.15 hrs — Introduction
K. Turowski
University of the Federal Armed Forces Munich, Neubiberg, Germany

09.30 hrs — Mass Customization Concepts for the E-conomy: Four Strategies to Create Competitive Advantage With Customized Goods and Services on the Internet
F.T. Piller, R. Reichwald, K. Moslein
Techische Universitaet Muenchen, Munich, Germany
PAPER #: 1673-199

10.15 hrs — On the Optimal Extent of Mass Customization
G.F. Knolmayer
University of Bern, Bern, Switzerland
PAPER #: 1673-090

11.00 hrs — Coffee break

11.25 hrs — Mass Customization and Beyond – Evolution of Customer Centricity in Financial Services
R. Winter
University of St. Gallen, Switzerland
PAPER #: 1673-142

12.10 hrs — Manufacturing Planing and Control Content Management in Virtual Enterprises Pursuing Mass Customization
C. Rautenstrauch and K. Turowski
of Magdeburg, Magdeburg, Germany
University of the Federal Armed Forces Munich, Neubiberg, Germany
PAPER #: 1674-171

12.55 hrs — Lunch break

14.30 hrs — Web Tools for Supporting Mass-Customization
K.J. Aldous, H.R. Nicholls
Industrial Research Limited, Christchurch, New Zealand
Alchemy Group Limited, Christchurch, New Zealand
PAPER #: 1674-048

15.15 hrs — Demands on Information Systems supporting Mass Customization logistics
R. Seelman-Eggebert, M. Schenk
Fraunhofer-Institute for Factory Operation and Automation,
IFF, Magdeburg, Germany
PAPER #: 1673-174

16.00 hrs	Coffee break
16.15 hrs	Application of Mass Customization and Knowledge-Based Design Techniques for the Development of Aeronautical Shape-Tools R. Bienvenido, A. Mora. M. Pastor-Sanchéz, M. Marcos, I.M. Flores-Parra, J.F. Bienvenido University of Cadiz, Cadiz, Spain University of Almeria, Almeria, Spain Paper #: 1633-026
17.00 hrs	Mass Customization of Digital Products in Electronic Commerce J. Schackmann, H. Link University of Augsburg, Augsburg, Germany Paper #: 1673-176
17.45 hrs	Concluding discussion
17.55 hrs	End of Workshop

FIRA-ISI2001 Robot-Soccer Workshop

Organizer:
FIRA, Federation of International Robot-soccer Associations

President:
Prof. Jong-Hwan Kim,
FIRA Founder and President, "Who's Who in the World" in 1998 and 1999,
Professor of Electrical Engineering, Korea Advanced Institute of Science and Technology, Taejon, Korea

'Effective Anthropometry'
Tutorial by Kathleen Robinette, USA and Eric Paquet, Canada

Description:
Anthropometry is the science of human measurement. The role of anthropometry in engineering is to provide measurements and methods for using human measurement to design products and services. The tutorial is based on recently developed techniques using 3D body scanners and modeling software for the achievement of effective anthropometry in engineering.

Outline:
- Introduction to 3D surface anthropometry
- 3D body scanners
- CAESAR: A 3D Anthropometry Survey
- Integrate® for editing
- Cleopatra® for database management
- Polyworks® for advanced 3D modeling
- Rapid prototyping techniques
- Statistics for anthropometry
- Effective solutions of anthropometry in design
- Fit mapping

Intended Audience:
Manufacturers, industrial designers, product developers, engineers, industry consultants and researchers. Students in mechanical and industrial engineering, industrial design, human factors, rehabilitation medicine, information systems. Researchers in aviation, military and transportation, technology and product consultants

Saturday, March 17, 2001 (09.00-12.55 hrs.) Room B204

'Information Security Management According to International Best Practices'
Tutorial by Basie von Solms, Rand Afrikaans University, Johannesburg, South Africa

In most companies the problem of the role and importance of information security have been resolved, in the sense that the strategic importance of information security has, in most cases, now been realized by top management.
The next problem arising now in many companies is how to go about implementing and specifically, managing information security.
This paper addresses this last problem by indicating how the emergence of international best practices, or Codes of Practice, for information security can, and should be used to ensure that all 'information security bases' are covered, and that information security is properly managed.
It also addresses the aspect of international information security certification, as well as information security measurement in a company.

Saturday, March 17, 2001 (14.00-17.55 hrs.) Room B203

'Improving Evolutionary Algorithms Performance through Multi-Recombination and Parallelism'
Tutorial by Raul Gallard, Argentina

Description:
Evolutionary computation (EC) has been recognized as a current research field, which studies a new type of algorithms: Evolutionary Algorithms (EAs). These algorithms process populations of solutions as opposed to most traditional approaches, which improve a single solution. All these algorithms share common features: reproduction, random variation, competition and selection of individuals.

During our research it was evident that some components of EAs should be re-examined. Exploration and exploitation of solutions in the searching space are distinctive characteristics of an evolutionary algorithm, and are responsible for the success or failure of the search process. Extreme exploitation can lead to premature convergence and intense exploration can make the search ineffective. To find a balance between these two factors is of paramount importance for the EA performance when speed of the search and quality of results are involved. Many researchers focus on the balancing problem studying the effect of selection mechanisms, because selective pressure can adjust exploration and exploitation. On its own, recombination can also participate on this respect but depending on how it is applied it can aid or disrupt the search process. For example, a low rate for recombination can impede schema processing permitting super-individuals to replenish the population, thus leading to premature convergence. On the other hand a high rate can be, in some cases, extremely disruptive allowing good genetic material to be lost, slowing down the search.
Parallel implementations of Evolutionary Algorithms also aim at improvements on performance. The main purpose of this approach is to enhance the quality of the results. The island model, a well known distributed approach, where separate subpopulations evolve in parallel is a realistic model of natural evolution which is appropriate for a distributed environment running a Single Program Multiple Data (SPMD) scheme.
This tutorial will show the most relevant and recent enhancements on recombination for genetic-algorithm-based EAs and migration control strategies for parallel genetic algorithm applied to diverse optimization problems including scheduling.

Saturday, March 17, 2001 (14.00-16.00 hrs & 16.15-17.55 hrs) Room B107

'Document Image Analysis and Understanding' (DIAU'2001)
Workshop by Dr. George Thoma, Chief, Communications Engineering Branch, National Library of Medicine, USA and Daniel X. Le, Daniel Lopresti and Thomas Kailath

We plan to bring together leading experts in the area of Document Image Analysis and Understanding that forms the basis for several new and innovative applications, some of which may be applicable to economic development in the Middle East and Asia as we move on to the next century.

This workshop will involve discussions on:
1. automated data extraction from printed journals for databases
2. automated recognition of data in engineering drawings for automatic manufacturing processes
3. extraction of map information for GIS systems
4. face recognition for security databases

Paper #: 1664-015
Title: Page Segmentation and Zone Classification: A Brief Analysis of Algorithms
Authors: O. Okun, D. Doermann, M. Pietikainen
University of Oulu, Finland
University of Maryland, USA

Saturday, March 17, 2001 (18.00-20.00 hrs) Room: Auditorium

‘ Intelligent Methods in Engineering and Management Present and Future’
Keynote speech by Prof. H.J. Zimmermann

President of the German Operations Research Society, the European Associations of Operational Research Societies, IFSA (International Fuzzy Systems Association), the German Industrial Engineering Society, and EEMA (European Engineering and Management Associations).

Abstract:
Intelligent methods are here defined in the sense of Computational Intelligence, a term that was coined 1992 when the three areas of Fuzzy Technology, Neural Nets, and Evolutionary Computing joined forces to offer solutions to problems, that had so far either no satisfactory or no solutions. Since then these three paradigms have developed considerably and they have Come up with hybrid methods, where ever they have proven to be complementary to each other. The most important complementarities will be described. They have first been applied - separately and in combination - to engineering problems, such as, control, process optimisation, analysis, diagnosis and others. Since recently however, applications in various areas of management have proven, that intelligent approaches may have even larger potentials here than in engineering. Successfully completed and ongoing projects will be described and future perspectives discussed.

Sunday, March 18, 2001 (09.00-10.00 hrs) Room: Auditorium

'Emergence, Evolution and Depiction: The Next 50 Years of Artificial Intelligence'
Keynote speech by Igor Aleksander, Gabor, United Kingdom

Professor of Electrical Engineering and Head of Intelligent and Interactive Systems, Department of Electrical and Electronic Engineering AND Pro Rector, External Relations, Imperial College of Science Technology and Medicine, London, U.K.

Abstract:
The last 50 years of AI were based on the paradigm of logic-driven search through symbolic databases. While this has come up with some pretty smart programs some of the fundamental ways in which the human brain achieves its intelligence remain undiscovered. This means that there is a dichotomy between what computer scientists call 'intelligent' and what intellignece is in living species. In this paper I shall present the three interleaved forces that are thought to underpin human intelligence. Emergence, once stripped of its mystical mantle, is a major force in ensuring stability not only in neural modules but also in architectures of such modules as they occur in the brain. Evolution can be shown to lead to complex architectures which are superior to those that engineers design and understand, causing the direct reverse engineering of the brain to be a precarious business. Depiction is the opposite of symbolic representation: it relies on the processing of rich data structures that closely resemble the originating states of the real world providing the organism whether artificial or real a sense of conscious control and a sensation of self. Examples of several current projects on visual awareness and motor control in artificial systems will be given.

Sunday, March 18, 2001 (10.00-11.00 hrs) Room: Auditorium

'Interfacing Living Neuron to Computers'
Keynote speech by Dr. Steve Potter, California Institute of Technology

A position paper on what is wrong with our current thinking about how to compute, and how studying the brain might give us insight into entirely different computational methods to employ in our artificial computing systems.

Sunday, March 18, 2001 (11.15-12.55 hrs.) Room B104

Session S1.1 (EBB'2001): 'E-Commerce 1'

Chair: Dr. Maj

Time: 11.15 – 11.35 hrs.
Paper #: 1623-097
Title: Supporting Supply Chain Management and E-Commerce through a IT/IS Infrastructure
Authors: S. Alshawi, Z. Irani, P.E. Love, M. Zairi
Brunel University, Uxbridge, United Kingdom
Deakin University, Geelong Australia
Bradford University, Bradford, United Kingdom

Time: 11.35 – 11.55 hrs.
Paper #: 1623-126
Title: A Framework for Multi-Agent Electronic Marketplaces: Analysis and Classification of Existing Systems
Authors: Karl Kurbel, Iouri Loutchko
Europe University Viadrina Frankfurt, Germany

Time: 11.55-12.15 hrs.
Paper #: 1623-121
Title: Supply Chain Smart Coordination in a Virtual Environment
Authors:, Ricardo Rabelo, Alexandra Augusta Pereira Klen, Edmilson Rampazzo Klen, Aureo Campos Ferreira
Federal University of Santa Catarina, Florianópolis, Brazil

Sunday, March 18, 2001 (11.15-12.55 hrs.) Room B206

Session S1.2 (ENAIS): 'Genetic and Evolutionary Algorithm Applications'

Chair: Dr. Rudolph

Time: 11.15 – 11.35 hrs
Paper #: 1643-146
Title: Solving Computer Systems Management Problems Via Evolutionary Computation
Authors: Raul Gallard, S.C.Esquivels
Universidad Nacional de San Luis, Argentina

Time: 11.35 - 11.55 hrs
Paper #: 1643-049
Title: The Genetic Algorithm Approach In Stability Analysis Of Fuzzy Control Systems
Authors: M.R.M. Rizk, I.F. El-Arabawy and H.S. Khaddam
Alexandria University, Alexandria, Egypt

Time: 11.55 – 12.15 hrs
Paper #: 1642-080
Title: Evolutionary Optimisation of Decentralized and Centralized Decision Rules in the Control of Production-Distribution Systems
Authors: K.T. Ling, B. Porter
The University of Hong Kong, Hong Kong

Time: 12.15 – 12.35 hrs
Paper #: 1644-185
Title: Modeling the Dynamics of an Automotive Engine Using Genetic Programming
Authors: Alaa F. Sheta, J. Gertler
George Mason University Fairfax, USA

Time: 12.35 – 12.55 hrs
Paper #: 1643-172
Title: EMG Signal Classification Using Evolutionary Hybrid RBF-MLP Networks
Authors: A. Zalzala
Heriot-Watt University Edingburgh, Scotland, United Kingdom

Sunday, March 18, 2001 (11.15-12.55 hrs.) Room: B207

Session S1.4 (IAM): 'Capacity Planning and Scheduling in Flexible Manufacturing Systems'

Chair: Dr. Ashok Kumar

Time: 11.15 – 11.35 hrs
Paper #: 1633-043
Title: A Paradigm Shift to Distributed Systems in Plant Automation
Authors: A. Klostermeyer, H. Kühnle, K. Lorentz
Fraunhofer-Institute for Factory Operation and Automation IFF, Magdeburg, Germany

Time: 11.35 – 11.55 hrs
Paper #: 1636-202
Title: An Aggregate Capacity Analysis Model for Flexible Manufacturing Systems
Authors: T. Koltai, K.E. Stecke, A. Farkas
Technical University of Budapest, Budapest, Hungary
University of Michigan Business School
Graduate School of Business Administration

Time: 11.55 – 12.15 hrs
Paper #: 1633-051
Title: Knowledge-Based Hybrid Modelling and Automation of a Mulitpass Experimental Rolling Mill
Authors: D.A. Linkens, M. Ibrahim, E.B. Tanyi
University of Sheffield, Sheffield, United Kingdom
University of Yaounde, Yaounde, Cameroon

Time: 12.15 – 12.35 hrs
Paper #: 1634-012
Title: Using Planning Steps for Production Planning
Author: S. Patig
Otto-von-Guericke-Universität, Magdeburg, Germany

Time: 12.35 – 12.55 hrs
Paper #: 1633-016
Title: Production Scheduling to Maximazi the Utilization of Parallel Non-Identical Batch Processors with Incompatible Job-Families
Author: M. Mathirajan, V. Chandru, K.N. Krishnaswamy
Indian Institute of Science, Bangalore, India

Sunday, March 18, 2001 (11.15-12.55 hrs.) Room: B208

Session S1.5 (Invited CT'2001)

Chair: Tatjana Welzer, Slovenia

Time: 11.15 - 11.35 hrs
Paper #: 1613-213
Title: Assessment of a Model-Based Diagnostics
Authors: M. Druzovec, T. Welzer
University of Maribor, Maribor, Slovenia

Time: 11.35 – 11.55 hrs
Paper #: 1613-214
Title: The Difficulties of Decision Trees in Abdominal Pain
Authors: P. Kokol, M. Zorman, H.P. Eich, C. Ohmann
University of Maribor, Maribor, Slovenia
Heinrich-Heine University Duesseldorf, Germany

Time: 11.55 – 12.15 hrs
Paper #: 1613-220
Title: Diagnosis Support System based on Medical Check-up
Authors: T. Matsumoto, K. Torigoe, Y. Shimada, H. Ohtsuka, K. Shibasato, S. Kawaji, Y. Ohta, S. Kawahara
Kumamoto National College of Technology, Suya Nishigoshi Kikuchi Kumamoto, Japan
Torigoe Hospital, Sasaga-machi Ibara-City Okayama, Japan
Okayama University Medical School, Shikada-machi Okayama, Japan
Kumamoto University, Kurokami, Japan

Time: 12.15 – 12.35 hrs
Paper #: 1613-216
Title: Computer Tomography based Diagnosis using Extended Logic Programming and Artificial Neural Networks
Authors: V. Alves, J. Neves, M. Maia, L. Nelas
Departamento de Informática, Universidade do Minho, Braga, Portugal
Centro de Tomografia de Braga, Braga, Portugal

Time: 12.35 – 12.55 hrs
Paper #: 1613-219
Title: Automatic Transcription of Electronic Medical Records to Case Structures For Use in Medical Case Base Reasoning Systems
Authors: S.S.R. Abidi, S. Manickam
Universiti Sains Malaysia, Penang, Malaysia

Sunday, March 18, 2001 (11.15-12.55 hrs.) Room B107

S1.6 'Autonomous and Artificial Systems, Exploring Hostile Environments' (AASEHE'2001)

Workshop by Prof. R. Pfeifer, Switzerland and Prof. U. Zimmer

Presentation by R. Pfeifer and U. Zimmer

Paper #: 1686-206
Title: ROBOVOLC: Remote Inspection for Volcanoes
Authors: A.K.M. Azad, G.S. Virk, M. Qi, G. Muscato, S. Guccione, G. Nunnari, T. White, C. Glazebrook, A. Semerano, M. Ghrissi, P. Briole, C. Faucher, M. Coltelli, G. Puglisi, R. Cioni, M. Pompilio
University of Portsmouth, Portsmouth, United Kingdom
Universita di Catania, Italy
Portsmouth Technology Consultants Ltd, Portsmouth, United Kingdom
Robosoft, Biarritz, France
IPGP – Institut de Physique du Globe de Paris, Paris, France
CNR-IIV- Instituto Internazionale di Vulcanologia CNR, Catania, Italy

Paper #: 1681-164
Title: Neural Networks (NN) Based Learning of Elementary Behaviors and their Integration in FPGA Architectures for a Fast Moving Robot Team (RoboCup)
Authors: A. Chohra, P. Schöll
German National Research Center for Information Technology, Sankt Augustin, Germany

Sunday, March 18, 2001 (11.15-12.55 hrs. & 16.15-17.55 hrs)

Room: B Students Lounge

POSTER SESSIONS

Paper #: 1643-228
Title: Location Estimation in Cellular Networks using neural networks
W. M. Ahmed, A. Hussain, S. I. Shah
Communications Enabling Technologies Pakistan Ltd.Software Technology Park, Islamabad, Pakistan.
University of Stirling, Scotland, United Kingdom

Paper #: 1643-160
Title: A New Recurrent Neural Network for Temporal Signal Processing
Authors: A. Hussain, J.J.Soraghan
University of Stirling, Stirling, Scotland, United Kingdom
University of Strathclyde, Glasgow G1 1XW, Scotland, UK

Paper #: 1614-175
Title: rSNP_Guide: Meta-Tools Predicting of Regulatory DNA Signals Damaged/Appeared Due to Single Nucleotide Mutation by Alterations in Pattern of DNA Binding to Nuclear Proteins
Authors: M. Ponomarenko, T. Merkulova, J. Ponomarenko, G. Vasiliev, Z. Levashova, G. Orlova, S. Lavruyshev, O. Fokin
Institute of Cytology and Genetics, Novosibirsk, Russia

Paper #: 1623-039
Title: A New Case-Based Reasoning Cycle for Electronic Commerce
Authors: E. Aimeur
University of Montreal, Montreal, Canada

Paper #: 1623-101
Title: POLYMORPHIC AGENTS FOR MODELING E-BUSINESS USERS
Boldur Bãrbat , C. Zamfirescu
Lucian Blaga" University of Sibiu, Sibiu, Romania

Paper #: 1624-106
Title: Integrating Features in a CTI-Application for the Phone User: The Communication Helper
Authors: D. Torres, R. Gutierrez, A. Carranza, M. Figueroa, L. Ximenez
CINVESTAV, Guadalajara, Mexico

Paper #: 1634-059
Title: Analyzing Timing Constraints in Flexible Manufacturing Systems
Authors: S. Flake, W. Mueller, U. Pape, J. Ruf
Paderborn University, Paderborn, Germany
Tuebingen University, Tuebingen, Germany

Paper #: 1643-103
Title: Developing Credible Agents for Captology
Authors: C. Bichiº, C. Stefan, D. Pipernea, B. Bărbat
Intelligent Systems Workgroup, Sibiu, Romania
"Lucian Blaga" University of Sibiu, Sibiu, Romania

Paper #: 1643-137
Title: Scheduling Tasks On Parallel Processors Using Population Learning Algorithm
Authors: P. Jedrzejowicz, M. Forkiewicz, E. Ratajczak
Technical University of Gdansk, Gdansk, Poland
Gdynia Maritime Academy, Gdynia, Poland

Paper #: 1643-238
Title: Neuro-Fuzzy Autonomous Cruise Control (AICC) System
Authors: M.A. Jarrah, Shaout A.
American University of Sharjah, United Arab Emirates
University of Michigan-Dearborn, Dearborn

Paper #: 1644-050
Title: Concurrency in the DD&P Robot Control Architecture
Authors: F. Schönherr, J. Hertzberg
GMD, AiS, ARC, Sankt Augustin, Germany

Paper #: 1653-088
Title: Applications of pressure Measurements
Authors: K. Hoffmann, M. Egger, W. Wahler
Vienna University of Technology, Vienna, Austria

Paper #: 1644-111
Title: A Framework for Knowledge Acquisition from Multiple Experts
Authors: M. Duecker, S. Thies
C-Lab, Paderborn
Heinz Nixdorf Institut, Paderborn, Germany

Robot-Soccer Championships-Orientation

Sunday, March 18, 2001 (14.00-15.00 hrs.) Room: Auditorium

'Graduate Education and E-Business'
Keynote speech by Prof. David Russell, Penn State Great Valley, School of Graduate Professional Studies, USA

Abstract:
A recent study showed that there were over 400,000 unfilled vacancies in the IT profession in the USA in large to mid-size companies alone, and that figure was expected to rise to over a million by the year 2000. While there is certainly no lack of persons who desire employment in the IT or other E-professions, there is a critical shortage of qualified professionals. The problem is exacerbated by mergers and closures in many of the popular technical employment fields, such as the nuclear and aerospace industries. Many colleges and universities, while being aware of this situation, are still turning out highly intelligent graduates, who have been formally instructed in these moribund disciplines, which are relevant only to an aging and sometimes sentimental professorate, at the expense of the basic skill sets that all employers require in today's marketplace.
This paper examines an innovative and entrepreneurial approach to graduate (post baccalaureate) degree programs that have been established at Penn State Great Valley School of Graduate Professional Studies in Information Science, Systems Engineering and Software Engineering and in an emerging University wide degree in Information Sciences and Technology. The paper touches on the design of efficient degree structures and curricula, and reports some assessment data collected over the past five years. Degree programs must meet the needs of both the highly trained (but maybe now redundant) professional and the baccalaureate novice both of whom are competing for employment in IT and E-Business. To conclude, the author makes a strong case for colleges and universities to depart from secure tradition, preferring a sometimes turbulent, but always exciting, new level of relevancy.

Sunday, March 18, 2001 (15.00-16.00 hrs.) Room: Auditorium

'Physiologically Inspired Technical Neural Systems'
Keynote speech by Prof. Hans Bothe, Technical University of Denmark, Denmark

Abstract:
The talk introduces and compares models for biologically inspired signal processing, which are derived from temporally coded neural systems. These 'pulsed' processing models are powerful extensions of the well known classical neural network paradigms. They have recently become a hot topic in neural network research, and hardware implementations propose major benefits. Applications in acoustics and vision will be demonstrated.

Sunday, March 18, 2001 (16.15-17.55 hrs.) Room: B104

Session S2.2 (ENAIS): 'Applications I'

Chair: Dr. Rocha

Time: 16.15-16.35 hrs
Paper #: 1644-083
Title: An Object-Based World Model for the Planning Problem
Authors: S. Al-Hasan, G. Vachtsevanos
Georgia Institute of Technology, Atlanta, USA

Time: 16.35 – 16.55 hrs
Paper #: 1644-139
Title: Wavelet Network Design Optimisation for Curve Family Modelling of Non-Linear Sensor
Author: D. Grimaldi
Università della Calabria, Rende, Italy

Time: 16.55-17.15 hrs
Paper #: 1644-062
Title: An Anomaly Identification Technique Based on Functional Models of Components
Authors: A. Gofuku, K. Inuzuka, Y. Tanaka
Okayama University Okayama, Japan

Time: 17.15-17.35 hrs
Paper #: 1674-117
Title: Generation of Interactive Visual Interfaces for Resource Management
Authors: A. Dangberg, W. Mueller
Paderborn University, Paderborn, Germany

Time: 17.35-17.55 hrs
Paper #: 1642-086
Title: Interpolation of Novel Object Views from Sample Views
Authors: G. Peters, C. von der Malsburg
Ruhr-Universität Bochum, Bochum, Germany

Sunday, March 18, 2001 (16.15-17.55 hrs.) Room: B206

Session S2.3 (IAM): 'Quality Control and Robust Control in Flexible Assembly'

Chair: Dr. Mrad

Time: 16.15-16.35 hrs
Paper #: 1643-082
Title: Shared Assembly Planning in Virtual Environment
Authors: S. Garbaya, P. Coiffet, P. Blazevic, E. Zussmann
Laboratoire de Robotique de Paris, Velizy, France

Time: 16.35-16.55 hrs
Paper #: 1634-036
Title: Merging Simulation and Control of Industrial Robot Workcells
Authors: A. Keibel
Institute of Robotics Research, Dortmund, Germany

Time: 16.55-17.15 hrs
Paper #: 1634-155
Title: Modelling and Robust Control of a Telemanipulator
Authors: H.N. Koivo, P. Rauhala
Helsinki University of Technology, Helsinki, Finland
Tampere University of Technology, Tampere, Finland

Time: 17.15-17.35 hrs
Paper #: 1633-116
Title: How to Compute the Number of Different Plans for Assembly and Manufacturing Tasks
Authors: C. Ramos, J. Rocha
Institute of Engineering, Porto, Portugal

Sunday, March 18, 2001 (16.15-17.55 hrs.) Room: B207

Session S2.4 (IQMM): 'Metrology 1'

Chair: Dr. Durakbasa

Time: 16.15-16.35 hrs
Paper #: 1654-138
Title: Neural Approach to Voiced-Unvoiced-Silence Analysis for Quality Measurements in Telecommunication Systems
Authors: D. Grimaldi, A. Aiello, P. Daponte
Università della Calabria, Rende, Italy
Università del Sannio, Benevento, Italy

Time: 16.35-16.55 hrs
Paper #: 1653-087
Title: The Imprecision of Pressure Measurments
Authors: K. Hoffmann, M. Egger
Vienna University of Technology, Vienna, Austria

Time: 16.55-17.15 hrs
Paper #: 1653-245
Title: The Structure for Functional Control of Manufacturing Processes
Authors: K.J. Stout, P.H. Osanna, B.G. Rosen
University of Huddersfield, Huddersfield, United Kingdom
Vienna University of Technology, Vienna, Austria
University of Gotenborg, Gotenborg, Sweden

Time: 17.15-17.35 hrs
Paper #: 1653-189
Title: Strategic Quality Planning For Customer Satisfaction
Authors: A. Kumar
Grand Valley State University, Grand Rapids, USA

Sunday, March 18, 2001 (16.15-17.55 hrs.) Room: B208

Session S2.5 (Invited CT'2001)

Chair: Tatjana Welzer, Slovenia

Time: 16.15 - 16.35 hrs
Paper #: 1613-222
Title: Challenges for the Slovenian HealthCare Informatics
Authors: D. Rudel, M. Premik
Faculty of Medicine, Institute of Biomedical Informatics, Ljubljana, Slovenia
Faculty of Medicine, Institute of Social Medicine, Ljubljana, Slovenia

Time: 16.35 - 16.55 hrs
Paper #: 1613-224
Title: Data Quality in Clinical Systems
Authors: T. Welzer, I. Golob, M. Druzovec, S. Slavec, B. Brumen, I. Takac
University of Maribor, Maribor, Slovenia
Infonet Kranj d.o.o., Kraj, Slovenia
Gynecology and Perinatology Clinic, Maribor Teaching Hospital, Maribor, Slovenia\

Time: 16.55 – 17.15 hrs
Paper #: 1613-218
Title: Helping Clinicians with Meta Decision Trees
Authors: M. Zorman, P. Kokol
University of Maribor, Maribor, Slovenia

Sunday, March 18, 2001 (16.15-17.55 hrs.) Room: B107

S2.6 'Autonomous and Artificial Systems, Exploring Hostile Environments' (AASEHE'2001)

Workshop by Prof. R. Pfeifer, Switzerland and Prof. U. Zimmer

Paper #: 1684-167
Title: Building and Navigation Tests for the Antarctic AUV "SARA"
Authors: B. Papalia, F. Andreucci, F. Pucci, M. Uliana
ENEA, Rome, Italy
DUNE, Rome, Italy

Paper #: 1682-166
Title: Autonomous Satellite Constellation for Planetary Exploration
Authors: G. Radice, C. R. McInnes
University of Glasgow, Scotland, United Kingdom

Paper #: 1684-133
Title: Control of Six-Legged Walking in Unpredictable Environment Biologically Inspired Solutions
Authors: H. Cruse, Jeffrey Dean, V. Dürr, J. Schmitz
Faculty of Biology, University of Bielefeld, Bielefeld, Germany
Department of Biology, Cleveland State University, Cleveland, USA

Monday, March 19, 2001 (09.00-10.00 hrs.) Room: Auditorium

'Intelligent Methods for Human-Friendly Interaction/Interface applied for Intelligent Residential Systems'
Keynote speech by Prof. Zeugnam Bien, Dean of Engineering, Korean Advanced Institute of Science & Technology, Taejon, Korea

Monday, March 19, 2001 (10.00-11.00 hrs.) Room: Auditorium

'Embodied Artificial Intelligence: Dynamics, morphology and materials in the emergence of cognition'
Keynote speech by Prof. Rolf Pfeifer, Director, Artificial Intelligence Laboratory Department of Information Technology University of Zurich, Switzerland

Abstract:
The field of artificial intelligence has dramatically changed during the past 15 years-or-so. Initially, starting in the fifties, intelligence was essentially considered to be synonymous with thinking, i.e. with problem solving, reasoning, and logical deduction. Thinking in turn could naturally be conceptualized as a sequence of steps, as algorithms, which is why artificial intelligence was mostly viewed as a sub-discipline of computer science. During the 1980s, as many people started building robots, the limitations of viewing intelligence as a computational phenomenon exclusively became obvious: the idea of mapping sensory stimulation such as camera images onto internal representations, generating plans of action by logical reasoning, and finally executing them, simply did not work in the real world. It was clear that a radically new approach would be required. Rodney Brooks of the MIT Artificial Intelligence Laboratory suggested that we forget about logic and problem solving, that we do away with thinking and with what people call high-level cognition and focus on the interaction with the real world. This interaction is, of course, always mediated by a body, i.e. the proposal was that intelligence needs to be "embodied". What originally seemed nothing more than yet another buzzword turned out to have profound ramifications and rapidly changed the research disciplines of artificial intelligence and cognitive science – a new research field had emerged. It is currently beginning to exert its influence on psychology, neurobiology, and ethology, as well as engineering.
Embodiment has two main types of implications, physical and information theoretic. The former are concerned with physical forces, inertia, friction, vibrations, and energy dissipation, i.e. anything concerned with the (physical) dynamics of the system, the latter with the relation between sensory signals, motor control and neural substrate. Rather than focusing on the neural substrate only, the focus is now on the complete organism which includes morphology (shape, distribution and physical characteristics of sensors and actuators, limbs, etc.) and materials. Often, problems (e.g. learning problems) that seem intractable if viewed from purely from a computational perspective, turn out to be easy if the embodiment and the interaction with the environment are appropriately taken into account. For example, given a particular task environment, if the morphology and the materials are right, the amount of neural processing required may be dramatically reduced. Moreover, it can be shown that embodiment greatly facilitates the bootstrapping of developmental processes which eventually may lead towards cognition.
In the talk I will review a number of examples illustrating some of the results and novel insights in this field, I will present a set of big challenges for the years to come, and I will outline a few application scenarios.

Monday, March 19, 2001 (11.15-12.55 hrs.) Room: B206

Session M1.1 (CT): 'Diagnostic Systems'

Chair: Dr. Lang

Time: 11.15-11.35 hrs
Paper #: 1614-145
Title: Classification of Skin Cancer and Benign Lesions Using Independent Component Analysis
Authors: Ch. Mies, Ch. Bauer, G. Ackermann, W. Bäumler, C. Abels, R.M. Szeimies, E.W. Lang
University of Regensburg, Regensburg, Germany
University Hospital, Regensburg, Germany

Time: 11.35-11.55 hrs
Paper #: 1613-091
Title: Simulation Modelling as a Means to Understanding Randomised Clinical Trials
Authors: L.P. Baldwin, T. Eldabi, R.J. Paul
Brunel University, Uxbridge, United Kingdom

Time: 11.55-12.15 hrs
Paper #: 1613-107
Title: On Confidentiality Protection in Multivariate Categorical Health Databases
Authors: G. Duncan, R. Krishnan, R. Padman, S. Roehrig
Carnegie Mellon University, Pittsburgh, USA

Time: 12.15-12.35 hrs
Paper #: 1613-034
Title: Does Your Doctor Support Your Use of the Internet as a Decision Support System? – An Australian Perspective
Authors: P.A.H. Williams, S.P. Maj, D. Shaw
Edith Cowan University, Mount Lawley, Australia

Monday, March 19, 2001 (11.15-12.55 hrs.) Room: B104

Session M1.2 (EBB): 'E-Commerce'

Chair: Dr. Irani

Time: 11.15-11.35 hrs
Paper #: 1643-017
Title: Agent Based Information Retrieval in Electronic Business Networks
Authors: F. Bodendorf, O. Hofmann
Universität Erlangen-Nuremberg, Nuremberg, Germany

Time: 11.35-11.55 hrs
Paper #: 1623-008
Title: A Single Protocol Smart Card for Multiple Applications
Authors: S.P. Maj, D.T. Shaw
Edith Cowan University, Perth, Australia

Time: 11.55-12.15 hrs
Paper #: 1624-037
Title: Effective Design and Development of Interactive 3D Illustrations for E-Commerce
Authors: V.Paelke, C. Geiger, C. Reimann, W. Rosenbach
University of Paderborn, Paderborn, Germany
Siemens AG, Paderborn, Germany

Time: 12.15-12.35 hrs
Paper #: 1623-073
Title: The Impact of WAP Technology on E-Commerce Users
Author: S. Al-Hawamdeh, K.W. Kuen
Nanyang Technological University, Singapore

Monday, March 19, 2001 (11.15-12.55 hrs.) Room: B207

Session M1.3 (ENAIS): 'Genetic and Evolutionary Algorithm Theory'

Chair: Dr. Sheta

Time: 11.15-11.35 hrs
Paper #: 1643-120
Title: To Design Compact Radial Basis Function Neural Network Using Regularization Approach
Authors: S. Ahmed
United Arab Emirates University, Al-Ain, United Arab Emirates

Time: 11.35-11.55 hrs
Paper #: 1644-128
Title: Ordered Greed, II: Graph Coloring
Authors: P.G. Anderson
Rochester Institute of Technology, Rochester, USA

Time: 11.55-12.15 hrs
Paper #: 1644-076
Title: Evolutionary Search under Partially Ordered Fitness Sets
Authors: G. Rudolph
University of Dortmund, Dortmund, Germany

Time: 12.15-12.35 hrs
Paper: 1643-030
Title: Evolutionary Optimization Method for RC-RBFN Based on Genetic Algorithm
Authors: K. Okuhara, T. Tanaka
Hiroshima Prefectural University, Shyobara, Japan

Time: 12.35-12.55 hrs
Paper #: 1643-198
Title: Directed Belief Networks
Authors: B. Yaghlane, K. Mellouli
Institut des Hautes Etudes Commerciales (Carthage), Carthage Présidence, Tunisia

Monday, March 19, 2001 (11.15-12.55 hrs.) Room: B208

Session M1.4 (ENAIS): 'Fuzzy Sets and Logic, Theory and Applications'

Chair: Dr. Mouhoub

Time: 11.15-11.35 hrs
Paper #: 1643-234
Title: Fuzzy Logic Based Autopilots for UAVs
Authors: M.A. Jarrah, K. Al-Widyan,
American University of Sharjah
Jordan University of Science & Technology

Time: 11.35-11.55 hrs
Paper #: 1644-114
Title: A Soccer Simulator Based on Fuzzy Logic
Authors: N. Marichal, L. Acosta, J.A. Estevez, L. Moreno
Universidad de La Laguna, La Laguna (Tenerife), Spain

Time: 11.55-12.15 hrs
Paper #: 1644-129
Title: Two Levels ß Distributed Fuzzy Decision-Making: Application to Plant Layout
Authors: S. Khan Mohammedi, A. Aghagolzadeh, I. Hassanzadeh, R.M. Mathur
University of Tabriz, Tabriz, Iran
The University of Western Ontario, London, Canada

Time: 12.15-12.35 hrs
Paper #: 1644-123
Title: Fuzzy Cellular Automata as a Concept of Synthesis Approach to Modelling.
Authors: M. Mraz, N. Zimic, I. Lapanja, I. Bajec
University of Ljubljana, Ljubljana, Slovenia

Monday, March 19, 2001 (11.15-12.55 hrs.) Room: B107

Session M1.5 (IAM): 'Flexible Automation'

Chair: Dr. Aziz

Time: 11.15-11.35 hrs
Paper #: 1633-057
Title: Tool Selection for Sheet Metal Punching Operations - Searching Techniques
Authors: E. Appleton, E. Summad
University of Durham, Durham, United Kingdom

Time: 11.35-11.55 hrs
Paper #: 1633-055
Title: Sharing Engineering Information and Knowledge – Contributions to PIPEFA's Platform
Authors: K. Drira, O. Nabuco, J. Mauricio Rosario,
Laboratoire d'Analyse et d'Architecture, Toulouse, France
Information Technology Institute, Campinas, Brazil
Laboratoire d'Analyse et d'Architecture des Systèmes, Toulouse, France
State University of Campinas, Cidade Universitaria "Zeferino Vaz, Campinas, Brazil

Time: 11.55-12.15 hrs
Paper #: 1633-020
Title: Rapid Knowledge Fusion in the Scalable Infosphere: A Concept and Possible Manufacturing Applications
Authors: A. Smirnov
St.Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, St.-Petersburg, Russia

Time: 12.15-12.35 hrs
Paper #: 1633-112
Title: An Ant System for Manufacturing Cell Formation
Authors: F. Viguier, H. Pierreval, S. Durieux, J. Alves
Laboratoire inter-établissements d'Informatique de Modélisation et d'Optimisation des Systèmes, Campus des Cézeaux, Aubière Cedex, France
Framatome Connectors Espana, St. Esteve Sesrovires (Barcelona), Spain

Time: 12.35-12.55 hrs
Paper #: 1633-242
Title: An Information Modelling Framework to Concurrent Product Design and Manufacturing
Authors: P.Y.L. Tu, S.Q. Xie
University of Canterbury, Christchurch, New Zealand

Monday, March 19, 2001 (11.15-12.55 hrs.) Room: B107

Session M1.6 (IQMM): 'Metrology 2'

Chair: Prof. Dr. Koltai

Time: 11.15-11.35 hrs
Paper #: 1653-244
Title: IMEKO and International Co-operation in the Field of Metrology
Author: T. Kemeny
Secretary General of IMEKO, Budapest

Time: 11.35-11.55 hrs
Paper #: 1653-233
Title: Intelligent Measurement of Microgaps Applying Photon Counting Method
Authors: R. Jablonski, J. Baszak
Warsaw University of Technology, Warsaw, Poland

Time: 11.55-12.15 hrs
Paper #: 1653-058
Title: PC-Based Instrumentation: Statistical System Error Calculator
Authors: F. Mrad, E. Khayat, M. El-Taha, K. Kelly
American University of Beirut, Beirut, Lebanon

Time: 12.15-12.35 hrs
Paper #: 1653-246
Title: Intelligent Methods in Design of Experiments (DoE)
Authors: A. Weckenmann, M. Rinnagl
Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany

Robot Soccer Championships-Preliminary Games
GROUP A

Monday, March 19, 2001 (14.00-15.00 hrs.) Room: Auditorium

'Ant navigation: mini brains - mega tasks - smart solutions', Prof. Rüdiger Wehner, Department of Zoology, University of Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland.

Abstract:
Ants of the Sahara desert, Cataglyphis by name, are skilful navigators. While foraging and homing over distances of several thousand times their body lengths, they accomplish truly formidable tasks. They use a pattern in the sky that is invisible to man to steer their compass courses, and then they integrate all angles steered and all distances covered by remarkable acumen. This system of path integration works even in completely featureless terrain. In addition, Cataglyphis can use landmarks by employing photographic skyline memories. Finally, they rely on search strategies that are much more efficient than a random walk would let one assume.

The talk focuses on the behavioural performances as well as on the sensory and neural mechanisms that are involved in mediating this behaviour. How can a 0.1-mg brain equipped with a panoramic compound-eye system accomplish these awe-inspiring modes of behaviour? The presentation will focus on the general sensory stratagems employed by Cataglyphis, and will show that this small-brain navigator uses simpler tricks than meets the human designer's eye. Cataglyphoid robots are used to test the hypotheses derived from neurophysiological analyses.

The general message is that a high-level task can be solved by the co-operation of a number of low-level systems. These low-level systems are adapted to the particular ecological niche, within which the desert navigator operates.

Tuesday, March 20, 2001 (09.00-10.00 hrs.) Room: Auditorium

'Intelligent System for System Integration'
Keynote speech by Prof. Toshio Fukuda, President of the IEEE Society on Robotics and Automation (1999-2000), Professor of Center for Cooperative Research in Advanced Science and Technology, Nagoya University, Japan

Abstract:
Intelligent systems are required in knowledge engineering, computer science, mechatronics and robotics. This paper discusses the machine (system) intelligence from the viewpoints of learning and adaptation of living things. Next, this paper introduces examples of integrated system developed by industrial companies, those are designed to work domestic area with intelligence. Finally, this paper shows an example of intelligent robotic system: brachiation robot developed in our project.

Tuesday, March 20, 2001 (09.00-10.00 hrs.) Room: Auditorium

'Virtual reality Problematics in Manufacturing'
Keynote speech by Prof. Phillipe Coiffet, Author of "Virtual Reality Technology' by John Whiley and Sons Inc., Director of the Virtual Robotics Lab, Polytechnic University, Paris, France

Abstract:
The immersion of human operator in virtual environment in order to carry out specific tasks resulted in a real revolution in the simulation methods. The immergence of new VR peripherals and high power processing computers allowed the application of virtual reality in the design if mechanical parts in manufacturing industry and the remote control of machines producing or assembling parts.

Tuesday, March 20, 2001 (11.15-12.55 hrs.) Room: B206

Session T1.1 (CT): 'Medical Decisions'

Chair: Dr. Eldabi

Time: 11.15-11.35 hrs
Paper #: 1614-068
Title: Analyzing Brain Tumor Related EEG Signals Using Adaptive-Geometric ICA-Algorithms
Authors: C.T. Bauer, E.W. Lang, C.G. Puntonet, M.A. Rodriguez
University of Regensburg, Regensburg, Germany
Departamento Architectura y Technologia de Computadores, Facultad de Ciencias, Granada, Espana

Time: 11.35-11.55 hrs
Paper #: 1614-072
Title: Blood Vessel Segmentation in Digital Subtraction Angiograms
Authors: M. Franz
Technische Univesität Dresden, Dresden, Germany

Time: 11.55-12.15 hrs
Paper #: 1614-065
Title: Analyzing Biomedical Signals With Probabilistic ICA and Kernel-Based Source Density Estimation
Authors: E.W. Lang, M.A. Rodriguez, C.G. Puntonet, Ch. Bauer, M. Habl

Time: 12.15-12.35 hrs
Paper #: 1644-067
Title: Neural-Jade Applied to Natural and Urban Images
Authors: E.W. Lang, Ch. Ziegaus
University of Regensburg, Regensburg, Germany

Tuesday, March 20, 2001 (11.15-12.55 hrs.) Room: B207

Session T1.2 (EBB): 'Simulation and Virtuality'

Chair: Dr. Hawamdeh

Time: 11.15-11.35 hrs
Paper #: 1623-152
Title: Simulation Model for Hotel Occupancy Rate in Gold Coast Using GPSS
Authors: S. Ahmed
United Arab Emirates University, Al-Ain, United Arab Emirates

Time: 11.35-11.55 hrs
Paper #: 1623-096
Title: Simulation Modelling: Bridging the Gap between Positivism and Interpretivism
Authors: Z.Irani, T. Eldabi, R.J. Paul, P.E.D. Love
Brunel University, Uxbridge, Middlesex, United Kingdom
Deakin University, Geelong, Victoria, Australia

Time: 11.55-12.15 hrs
Paper #: 1623-084
Title: Knowledge Configuration in Virtual Enterprises
Authors: N. Silva, J. Rocha
Instituto Superior de Engenharia do Porto, Porto, Portugal

Tuesday, March 20, 2001 (11.15-12.55 hrs.) Room: B208

Session T1.3 (ENAIS); 'Neural Network Theory'

Chair: Dr. Al-Rawi

Time: 11.15-11.35 hrs
Paper #: 1644-099
Title: A Novel Algorithm for Training Polynomial Networks
Authors: K.T. Assaleh
Conexant Systems Inc., Newport Beach, CA, USA
Motorola Labs, Tempe, AZ, USA

Time: 11.35-11.55 hrs
Paper #: 1644-182
Title: Utilization of Fixed Structure Learning Automata for Adaptation of Learning Rate in Backpropagation Algorithm
Authors: H. Beigy, M.R. Maybodi, M.B. Menhaj
Amirkabir University of Technology, Tehran, Iran

Time: 11.55 – 12.15 hrs
Paper #: 1644-074
Title: Constructive Neural Networks with Regularization Approach in the Hidden Unit Training
Authors: J. Lahnajarvi, M. Lehtokangas, J. Saarinen
Tampere University of Technology, Tampere, Finland

Time: 12.15-12.35 hrs
Paper #: 1641-197
Title: A Modified Learning Algorithm to Improve Fault Tolerance of Dynamic Neural Networks
Author: A. Moosaviena, K. Mohammadi
Iran University of Science and Technology, Narmak, Tehran, Iran

Tuesday, March 20, 2001 (11.15-12.55 hrs.) Room: B104

Session T1.4 (IAM); 'Time Series and Diagnostics'

Chair: Dr. Koltai

Time: 11.15-11.35 hrs
Paper #: 1633-153
Title: Simulation Approach to Improve Performance of the Seasonal Time Series Decomposition Method
Authors: S. Ahmed
United Arab Emirates University, Al-Ain, United Arab Emirates

Time: 11.35-11.55 hrs
Paper #: 1633-028
Title: Shape Rolling Pass Design
Authors: E. Appleton, L. Jing, E. Summad
University of Durham, Durham, United Kingdom

Time: 11.55-12.15 hrs
Paper #: 1634-071
Title: Interactive, Adaptive Time Series Analysis for Online Diagnosis of Technical Processes
Authors: P. Feucht, T. Zirzlaff, O. Leisin, K. Berns
Universität Karlsruhe, Karlsruhe, Germany

Time: 12.15-12.35 hrs
Paper #: 1634-196
Title: Development Of An On-Line Tool Condition Monitoring System In Cold Bulk Metal Forming
Authors: S. Nahavandi, J. del Mar, T. Parsons, A.Z. Kousani, L.X. Kong
Deakin University, Geelong, Australia

Time: 12.35-12.55 hrs
Paper #: 1633-013
Title: Development of Reliable Automaton Algorithm for Discrete Control System
Authors: S. Tairov, M. Aurelio Boff, G. Zolet
University of Caxias do Sul, Caxias do Sul, Brazil

Tuesday, March 20, 2001 (11.15-12.55 hrs.) Room: B107

Session T1.5 (Invited IQMM'2001)

Chair: Hans Juergen Leopold

Time: 11.15-11.35 hrs
Paper #: 1653-150
Title: High Precision Dimensional Analysis of Manufactured Parts: Synthetic Images and Knowledge Help Image Data Evaluation and Interpretation
Authors: P. Graebling, E. Hirsch
University of Louis Pasteur Strasbourg, Illkirch Graffenstaden, France

Time: 11.35-11.55 hrs
Paper #: 1653-179
Title: Surface Integrity of Ultra-Precision Machined Surfaces
Authors: V.C. Venkatesh, S. Izman, M. Konneh, T.T. Mon
University of Technology Malaysia, Johor, Malaysia

Time: 11.55-12.15 hrs
Paper #: 1653-159
Title: Surface Shape Measurement by Digital Holography
Authors: I. Yamaguchi, S. Ohta, J. Kato
RIKEN, The Institute of Physical and Chemical Research, Saitama, Japan

Time: 12.15-12.35 hrs
Paper #: 1653-124
Title: Simultaneous Measurement of the Amplitude and Frequency Parameters of Surface Roughness
Authors: Dalwoo Kim, Ki-Jang Oh, Choong-Soo Lim
Research Institute of Industrial Science and Technology, Pohang, Korea

Tuesday, March 20, 2001 (14.00-15.00 hrs.) Room: Auditorium

'Agents and Information Technology'
Keynote speech by Dr. Abdulla Mohammed, Research Manager, Dubai Internet City, Dubai, United Arab Emirates

Abstract:
This paper describes Agents technology and its application. First, we present a background about agents technology. Then, we present some definitions of agents as described by the top researchers in this field. We end this half by describing Multiagent Systems (MAS) and its relevance to Distributed Artificial Intelligence (DAI) and comparing it to Distributed Problem Solving (DPS). In the second half of this paper, we present some current applications of agents technology such as NASA's space probes (Deep Space-1) and other Internet applications. Then, we suggest some future applications for agents in Information Technology such as query agents and collective store database. We conclude this paper by speculating about a more sociable Web as a result of the agents' behavior such as cooperation and benevolence.

Tuesday, March 20, 2001 (15.00-16.00 hrs.) Room: Auditorium

'Multi-Agent Robot Soccer System'
Keynote speech by Prof. Jong-Hwan Kim,
FIRA Founder and President, "Who's Who in the World" in 1998 and 1999,
Professor of Electrical Engineering, Korea Advanced Institute of Science and Technology, Taejon, Korea

Abstract:
Robotics competitions have become popular and attract people from all walks of life through out the world irrespective of their ages. Robot soccer makes heavy demands in all the key areas of robot technology, mechanics, sensors, communication, and intelligence. The hope of course, is that by discovering how to get a robot to move with agility, see with acuity, and think perceptively in the limited context of a soccer game, it will be possible to use the same techniques to build robots to carry out other more useful tasks. We briefly discuss the multi-agent scenario pertaining to robot-soccer and its implications in 21st century. A short discussion on FIRA and related activities will be also included.

Tuesday, March 20, 2001 (16.15-17.55 hrs.) Room: B206

Session T2.2 (EBB); 'Computational'

Chair: Dr. Jihad Nader

Time: 16.15-16.35 hrs
Paper #: 1623-044
Title: Interval Arithmetic and Fuzzy Logic
Authors: S. Rump
Technical University Hamburg-Harburg, Hamburg, Germany

Time: 16.35-16.55 hrs
Paper #: 1624-125
Title: Algebraic Specification for Flexible Complex Calls: A First Approach
Authors: D. Torres Román
National Politechnic Institut, Guadalajara, Jalisco, Mexico

Time: 16.55-17.15 hrs
Paper #: 1613-300
Title: Search Engines: Key to Knowledge Acquisition
Authors: M. Anvari
University of California, Berkeley, USA

Tuesday, March 20, 2001 (16.15-17.55 hrs.) Room: B207

Session T2.3 (ENAIS); 'Learning Systems'

Chair: Dr. Assaleh

Time: 16.15-16.35 hrs
Paper #: 1644-089
Title: Knowledge Representation to Support Learner Interaction in an ITS
Authors: L.F.R. Faria, Z. Vale, C. Ramos, A. Marques
Institute of Engineering – Polytechnic of Porto
REN-Portuguese Transmission Network (EDP Group)

Time: 16.35-16.55 hrs
Paper #: 1643-081
Title: Human Behavior in Virtual Assembly Task
Authors: S. Garbaya, P. Coiffet
Laboratoire de Robotique de Paris, Vélizy, France

Time: 16.55-17.15 hrs
Paper #: 1644-011
Title: Managing Numeric and Symbolic Information for Scheduling and Planning
Authors: M. Mouhoub
University of Lethbridge, Lethbridge, Alberta, Canada

Time: 17.15-17.35 hrs
Paper #: 1643-060
Title: TEMPUS: A Machine Learning Tool
Authors: Z. Vale, J. Duarte, C. Ramos, A. Marques
Polytechnic Institute of Porto (IPP)/Institute of Engineering, Porto, Portugal
REN - Portuguese Transmission Network (EDP Group), Porto, Portugal

Tuesday, March 20, 2001 (16.15-17.55 hrs.) Room: B104

Session T2.4 (ENAIS); 'Multi-agents Theory and Applications'

Chair: Dr. Anderson

Time: 16.15-16.35 hrs
Paper #: 1641-190
Title: Self-adaptive Parameter free Training to Model Tourist Arrival in Australian Hotel Industries Industry
Authors: S. Ahmed, J. Cross, A. Bouzerdoum
United Arab Emirates University, Al-Ain, United Arab Emirates
Edith Cowan University, Perth, Australia.

Time: 16.35-16.55 hrs
Paper #: 1643-177
Title: Holons and Agents in Robotic Teams: A Synergistic Approach
Authors: B. Barbat, C. Candea, C. Zamfirescu
'Lucian Blaga' University of Sibiu, Sibiu, Romania
Artificial Intelligence Research Group Sibiu, Sibiu, Romania

Time: 16.55-17.15 hrs
Paper #: 1643-115
Title: Scalable Intelligence: A New Concept for the Evolution of Decision Support Systems to Intelligent Systems/Agents
Authors: C. Ramos
Institute of Engineering, Porto, Portugal

Tuesday, March 20, 2001 (16.15-17.55 hrs.) Room: B107

Session T2.5 (IQMM); 'Metrology 3'

Chair: Dr. Cruz Machado

Time: 16.15-16.35 hrs
Paper #: 1654-227
Title: Displacement Estimation Based on Phase Data of the Cross-Spectrum of Images
Authors: B.G. Zagar
Graz University of Technology, Graz, Austria

Time: 16.35-16.55 hrs
Paper #: 1653-247
Title: Model-Based Optimization and Control of Shortened Process Chains
Authors: A. Weckenmann, V. Bettin, R. Stoeber
Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany

Time: 16.55-17.15 hrs
Paper #: 1653-141
Title: Intelligent Control or Measuring Equipment and Test Instruments for Precision Engineering
Authors: N. Durakbasa
Vienna University of Technology, Vienna, Austria

Robbot Soccer Championships-Preliminary Games
GROUP B

Wednesday, March 21, 2001 (09:00-10:00 hrs.) Room: Auditorium

'Recent Advances in Neuroprosthetic Therapies: Artificial Vision'
Keynote speech by Prof. Richard Normann, Professor of Bioengineering, University of Utah, Salt Lake City, USA

Biography:

Professor Normann has moved from conventional electrical engineering to retinal physiology and into cortical physiology over the past 30 years. His electrical engineering background and his interests in neurophysiology have provided unique insights into the studies of the vertebrate visual system. It has been long appreciated that the parallel processing functions of the nervous system can best be studied with tools that will allow one to examine firing patterns of large numbers of neurons or to excite large numbers of neurons via extrinsic currents. A variety of techniques have evolved which permit this parallel acquisition of information but many of these techniques have poor spatial and/or temporal resolution which limit their utility in understanding how groups of neurons work in concert. Normann and his students and colleagues have developed a unique microelectrode array which provides unprecedented spatial and temporal resolution recording of activity from large numbers of neurons in cerebral cortex and recently, in the peripheral nervous system. Because these microelectrode arrays are fabricated mainly from silicon, they have been demonstrated to be highly biocompatible: single unit recordings have been made from motor cortex in behaving primates for periods exceeding three years.

Normann and his colleagues have had to develop support systems which enable researchers to utilize these arrays to their fullest capabilities. Implantation of 100 very sharp microelectrodes cannot be achieved with manual techniques. The Normann team has developed a high velocity impulse insertion technique that allows complete insertion of the arrays with little or no cortical trauma. One is next confronted with the problem of having to deal with up to 100 channels of neural information on each array. Normann and his colleagues have developed 100 channel neural signal amplifiers that boost and, optimally filter the signals. The signals are sent to a 100-channel digital signal processing based data acquisition system. This system comprises 100 channels of data, displays on-line and in real time continuously produces raster plots from each of the 100 channels and stores this data in a conventional Pentium-class P.C.

This suite of tools has been used by Normann and his graduate students to study parallel information processing and encoding of visual information by the vertebrate retina, the cat visual cortex and monkey motor cortex. Normann and his colleagues have shown that individual ganglion cells in the turtle are relatively poor classifiers of visual features; however, small groups of ganglion cells allow for the classification of intensity into and color good fidelity. Further, Normann and his colleagues have shown that there are temporal dependencies in this encoding of visual information; response shuffling degrades the classification performance of the groups of ganglion cells. Similar temporal dependencies are seen in ensembles of cells in monkey motor cortex. In collaborative studies done with Dr. John Donoghue at Brown University, we have shown that the volitional intent of a monkey trained to play simple video games can be determined from as few as 15 neurons in motor cortex. Again, shuffled responses degrade the estimation of the monkey's performance suggesting that temporal dependencies in the firing of ensembles of M1 units are involved in the encoding of volitional intent. These tools and their validation in animal experiments, are leading to human experiments that will be directed at the development of neuroprosthetics systems that will offer new avenues for therapy for those with damaged or diseased parts of their nervous system. Professor Normann plans to continue the development of these electrode arrays and associated technologies, using these arrays in animal experimentation and to begin this new phase of human experimentation.

Wednesday, March 21, 2001 (10:00-11:00 hrs.) Room: Auditorium

'Dependable Bridge between Healthcare and Engineering'
Keynote speech by Prof. Hirokazu Ihara, Professor of Radiology and Information Science, International University of Health and Welfare, Tochigi, Japan

Abstract:
Rapid research and development as well as utilization of information and communication technologies in the latter half of twentieth century are changing the structure of economy, society and culture. And, by the rapid change of population composition with aging and mobility of the residence, the healthcare becomes one of the large problems in the twenty-first century in both advanced and developing countries. For the solution of the problem with which this mankind is encountering, the information technology plays a large role. However, the systematization of medical information for medical treatments greatly been retarded in comparison with the computerization of social systems and industrial systems succeeded in spite of much effort until now. We can call it one of the computerization regions left finally.

We can list the issues to be considered as following.
- Society demand to the healthcare
- The paradigm of tele-medicine and home healthcare in the aging society
- The concept of dependability in medicine, healthcare, information and control technology fields
- Diagnosis, medical treatment and healthcare technologies by the combination of medical and scien ce/engineering thoughts
- Organizing system, information and control technologies necessary for the aging society
- Succession of health information and information/control systems
- Education and training of medical practitioners who can follow the progress in medicine and infor mation in the long term
- Strategic improvement in the regions provided with poor information communication infrastructure

Here we introduce our Autonomous Intelligent Healthcare System under research and development with new concept for the bridge between medicine and science/engineering. As a new paradigm in the twenty-first century, Ihara lately proposed Advanced Decentralization Concept recently which was extension of Autonomous Decentralization Concept already applied widely to the industry. It was originally introduced in 1980 from wide R/D experiences in many information and control systems.

The object of Autonomous Intelligent Healthcare System based on new concept is the private individual but not people. It is an intelligent system with adequate algorithm and reasoning including the artificially-intelligent functions which metamorphose in proportion to the condition of each person in recovery and maintain after damage or decrease of the functions by synthetically observing and measuring characteristics of the organism. The system depends greatly on both advanced engineering technology and hearty healthcare technology.

Wednesday, March 21, 2001 (11:15-12:55 hrs.) Room: B104

Session W1.2 (EBB); 'Security & Intelligent Networking, Routing and Navigation'

Chair: Dr. Maj

Time: 11.15-11.35 hrs
Paper #: 1624-047
Title: Intelligent Techniques for Congestion Controller in a Prioritised ATM switch
Authors: A.S. Al-Hammadi, J. Schormans
Etisalat College of Engineering, Sharjah, United Arab Emirates
Queen Mary and Westfield College, London, United Kingdom

Time: 11.35-11.55 hrs
Paper #: 1623-100
Title: A New Generation of Personal Navigation System for Fairs and Exhibitions
Authors: G. Bieber
Fraunhofer Institute / Computer Graphics (IGD), Rostock, Germany

Time: 11.55-12.15 hrs
Paper #: 1624-143
Title: Agents for Navigating Virtual Reality E-Commerce Environments
Authors: A. Nijholt, B. Van Dijk
University of Twente, Enschede, The Netherlands

Time: 12.15-12.35 hrs
Paper #: 1621-021
Title: Outsourcing Scientific Computations Securely
Authors: J.R. Rice, M.J. Atallah
Purdue University, West Lafayette, USA

Wednesday, March 21, 2001 (11:15-12:55 hrs.) Room: B206

Session W1.3 (ENAIS); 'Neural Network Applications'

Chair: Dr. Assaleh

Time: 11.15-11.35 hrs
Paper #: 1643-178
Title: A Boltzmann Machine for Solving Time Tabling Problem
Authors: H. Al-Rawi, N.M. Al-Din
Balqa Applied University, Amman, Jordan
University of Technology, Baghdad, Iraq

Time: 11.35-11.55 hrs
Paper #: 1644-169
Title: Pattern Recognition Ability of a Multi-Agent Model of the Immune System
Authors: G. Nicosia, F. Castiglionet, S. Motta
University of Catania, Catania, Italy
University of Cologne, Köln, Germany

Time: 11.55-12.15 hrs
Paper #: 1644-056
Title: Pharma-Marketing with the Neuro-Fuzzy-System "Merlin"
Authors: O. Sauerzapf, H. Ohnsorge, D. Schweigert
MEX GmbH, D-55294 Bodenheim, Germany
Universitt Kaiserslautern, Kaiserslautern, Germany

Time: 12.15-12.35 hrs
Paper #: 1644-023
Title: Neural Network Based Classification System for Acoustic Helicopter Signals
Authors: M. Viitanen, J.T. Syrjarinne, J.P.P. Saarinen
Tampere University of Technology, Tampere, Finland

Wednesday, March 21, 2001 (11:15-12:55 hrs.) Room: B207

Session W1.4 (IAM); 'Modelling Manufacturing Systems'

Chair: Dr. Machado

Time: 11.15-11.35 hrs
Paper #: 1633-038
Title: Bilinear Modelling of a Non-Linear System
Authors: K.I. Aziz
NEC Technologies Ltd, Reading, United Kingdom

Time: 11.35-11.55 hrs
Paper #: 1633-061
Title: Lean Production in a Rail Vehicle Manufacturing Industry: Critical Issues
Authors: V. Cruz Machado
University Nova of Lisbon, Monte Caparica, Portugal

Time: 11.55-12.15 hrs
Paper #: 1634-070
Title: A UML Model for the MaSHReC Architecture
Authors: D.A. El Kebbe
University of Paderborn, Paderborn, Germany

Time: 12.15-12.35 hrs
Paper #: 1634-040
Title: Intelligent Decentralized Optimal Control Strategy for Traffic Crossing Signals
Authors: R. Zhu, Y. Yamana
Ashikaga Institute of Technology, Ashikaga City, Tochigi-prefecture, Japan

Time: 12.35-12.55 hrs
Paper #: 1633-241
Title: An Integrated Data Structure for Supporting Rapid Product Development
Authors: P.Y.L. Tu, S.Q. Xie, L.J. Kirwan, K.W. Chew
University of Canterbury, Christchurch, New Zealand

Wednesday, March 21, 2001 (11:15-12:55 hrs.) Room: B107

Session W1.5 (IQMM); 'Intelligent Quality'

Chair: Dr. Seiedi

Time: 11.15-11.35 hrs
Paper #: 1654-045
Title: Quality Measure for Colour Image Segmentation
Authors: R. Blake, A. Juozapavicius
Norwegian University of Science & Technology, Trondheim, Norway
Vilnius University, Lithuania

Time: 11.35-11.55 hrs
Paper #: 1653-225
Title: Multi Agent Systems in Quality Management
Authors: P. Kopacek, M.W. Han
Vienna University of Technology, Vienna, Austria

Time: 11.55-12.15 hrs
Paper #: 1654-226
Title: Optimization of Measuring Processes
Authors: K. Meissner
University of Applied Sciences, Jena, Germany

Wednesday, March 21, 2001 (14:00-15:00 hrs.) Room: Auditorium

'Unsupervised learning for data and signal analysis'
Keynote speech by Prof. Erkki Oja, Head of the Neural Networks Research Centre and Head of the Laboratory of Computer and Information Science, Helsinki University of Technology, Finland

Wednesday, March 21, 2001 (15:00-16:00 hrs.) Room: Auditorium

'The New Clinical Research: using bioinformatics in patient care'
Keynote speech by Dr. Atul Butte, Harvard University, Children Hospital USA

Abstract:
Although the Human Genome Project will have the entire genome sequence in 2003, determining the role for all genes will remain a challenge. Newer oligonucleotide microarrays allow the simultaneous quantitative measurement of the expression of 35,000 unique human RNAs in any tissue. Based on experiments using this technique, candidate genes linked to pathophyiologic processes are being found and screened for defects that could predict disease outcomes and guide optimal therapy. This has successfully been started for diabetes, leukemia, and other cancers. Linking genomics research to patient care will be the leading edge of clinical research in the post-genome era.

Wednesday, March 21, 2001 (16:15-17:55 hrs.) Room: B206

Session W2.2 (ENAIS); 'Applications II'

Chair: Dr. Rocha

Time: 16.15-16.35 hrs
Paper #: 1643-033
Title: An Estimation Method of the Words Tendency Based on Time-Series Variation
Authors: A. El-Sayed, O. Makoto, S. Masami, A. Jun-ichis
University of Tokushima, Tokushima, Japan

Time: 16.35-16.55 hrs
Paper #: 1644-029
Title: Discovering Paths Traversed by Visitors in Web Server Access Logs
Authors: A.T. Mizrak
Bilkent University, Ankara, Turkey

Time: 16.55-17.15 hrs
Paper #: 1653-200
Title: Wall Sound Transmission Class Estimations
Authors: C. Neocleous, P. Eleftheriou, C.N. Schizas
Higher Technical Institute, Nicosia, Cyprus
University of Cyprus, Nicosia, Cyprus

Time: 17.15-17.35 hrs
Paper #: 1643-014
Title: Analysis of Precedence Graphs Complexity for Manufacturing Process
Authors: J. Rocha
Instituto Superior Engenharia do Porto, Porto, Portugal

Time: 17.35-17.55 hrs
Paper #: 1644-211
Title: Computer Vision Application to Automatically Recognise Handwritten Arabic Characters
Authors: S. Al-Ma'adeed
University of Nottingham, Nottingham, United Kingdom

Wednesday, March 21, 2001 (16:15-17:55 hrs.) Room: B104

Session W2.3 (ENAIS); 'Multi-Agents Theory and Applications'

Chair: Dr. Ahmed

Time: 16.15-16.35 hrs
Paper #: 1643-102
Title: Pathematic Agents for Medical Informatics
Authors: B.E. Barbat
'Lucian Blaga' University of Sibiu, Sibiu, Romania

Time: 16.35 -16.55 hrs
Paper #: 1644-113
Title: Towards UML-based Analysis and Design of Multi-Agent Systems
Authors: C. Geiger, J.M. Kuester, S. Flake
Siemens AG IC C-Lab, Paderborn, Germany

Time: 16.55-17.15 hrs
Paper #: 1643-085
Title: Multi-Agent System for Electricity Market Simulation
Authors: Z. Vale, I. Praca, C. Ramos, F. Mauricio-Dias
Polytechnic Institute of Porto, Porto, Portugal

Wednesday, March 21, 2001 (16:15-17:55 hrs.) Room: B107

Session W2.4 (IAM); 'Automation Issues'

Chair: Dr. Shahwan Khouri

Time: 16.15-16.35 hrs
Paper #: 1634-194
Title: Design and Prototyping of a Low Cost Servo-Valve For the Control of Pneumatic Muscles in Robots
Authors: S. Nahavandi, A.Z. Kouzani
Deakin University, Geelong 3217, Australia

Time: 16.35-16.55 hrs
Paper #: 1633-184
Title: Intelligent Design of Die Components in Cold Extrusion
Authors: M.E.Yurci, V. Taskin, N. Urkmez
Yildiz Technical University, Yildiz, Turkey

Time: 16.55-17.15 hrs
Paper #: 1634-195
Title: Selfsimilar Image Feature Extraction
Authors: S. Nahavandi, A.Z. Kouzani
Deakin University, Geelong, Australia

Time: 17.15-17.35 hrs
Paper #: 1633-005
Title: Supervision and Control in Man-Machine System: Supervisory Architecture and Decision-making
Authors: A. Skaf, B. David, B. Descotes-Genon, Z. Binder
Laboratoire d'Automatique de Grenoble, Saint Martin d'Hères Cedex, France
Laboratoire ICTT, Ecole Centrale de Lyon, Ecully Cedex, France

Wednesday, March 21, 2001 (16:15-17:55 hrs.) Room: B207

Session W2.5 (IQMM); 'Processes & Surface Inspection'

Chair: Dr. Venkatesh

Time: 16.15-16.35 hrs
Paper #: 1643-243
Title: A Concept For Application of Statistical Analysis of Product Geometry Measurement Results in Intelligent Product Specification and Verification
Authors: A. Afjehi-Sadat, M.N. Durakbasa, P.H. Osanna
Vienna University of Technology, Vienna, Austria

Time: 16.35-16.55 hrs
Paper #: 1653-212
Title: Repetitive Pattern Recognition In Process Control Charts Using Analysis Of Variance
Authors: M. Seiedi, K. Rezaei
Tehran University, Tehran, Iran

Time: 16.55-17.15 hrs
Paper #: 1653-239
Title: Nano Scanning Images
Authors: P.H. Osanna, L. Si
Vienna University of Technology, Wien, Austria

Robot Soccer Championship
FINALS

Upcoming Events:

CIMA 2001
International ICSC Congress on
COMPUTATIONAL INTELLIGENCE: METHODS & APPLICATIONS
June 19-22, 2001
Bangor, Wales, U.K.

SOCO/ISFI 2001
Fourth International ICSC Symposium on
SOFT COMPUTING and INTELLIGENT SYSTEMS FOR INDUSTRY
June 26-29, 2001
Paisley, Scotland, U.K.

WMC/DI-TESA 2001
Third International ICSC Congress on
World Manufacturing Congress
September 24-27, 2001
Rochester, New York, USA

NF 2002
International ICSC Symposium on
Neuro-Fuzzy (NF'2002)
16-19 January 2002, Havana, Cuba

ICAIS 2002
First International ICSC Congress on
AUTONOMOUS INTELLIGENT SYSTEMS
12-15 February 2002
Deakin, Australia

All other information concerning coming events for the next few years can be found on the following website:

http://www.icsc-naiso.org