IAPR

International Association for Pattern Recognition Inc
An affiliate member of the International Federation for Information Processing

NEWSLETTER

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> **January 1995 Issue Deadline**
> **14 November 1994**

FROM THE EDITOR'S DESK

Dear Everybody,
This newsletter issue coincides with **The Big Event:** The 12-ICPR in Jerusalem. I hope I'll see several of you there. And those who will have no chance to go, I hope that we shall conference together in some other equally exciting place of the world!   (With the proliferation of conferences, I think the time is ripe to introduce a new verb into the English language: *to conference,* meaning to go to lots of conferences; (some people may have a cynical view on this, see the cartoon by Terry Fountain on p. 8).

Talking about conferences, reminds me of the perennial issue of what is sponsored by IAPR and what is not and what that means in practical terms.   A lot of people seem to think that if a conference/workshop is organised by a member society it is automatically sponsored and can use the IAPR logo and the IAPR newsletter space for advertisement. This is not the case. With the exception of ICPR, all conferences and workshops have to go every time through the process of obtaining sponsorship, outlined in the April issue of this year, (Vol 16, No 2).   By this means, IAPR helps to avoid date clashes.

Apart from the use of the IAPR logo, and the possibility of borrowing money from IAPR, a sponsored conference can be advertised free of charge through this newsletter using almost a whole column of text, far more than non-sponsored conferences. The benefits of attending a sponsored conference, apart from the fact that sometimes some such conferences offer discounted participation fees to IAPR members, is also the knowledge that some extra care has been taken in choosing the programme committee and the theme of the conference as these have to be approved by IAPR before sponsorship is granted.

In the meantime, those of you who are not involved in such demanding jobs as conference organising, ignore all the above and enjoy conferencing! (I had to find a way to use the new verb again...)

Maria Petrou

NEWS FROM MEMBERS

SUNY PROFESSOR'S PAPER CHOSEN BEST IN FUZZY THEORY AND TECHNOLOGY

A State University of New York at Binghamton Professor has won the 1993 Lotfi A. Zadeh Best Paper Award in the scientific field of fuzzy logic for a paper entitled "Multivalued Logics Versus Modal Logics: Alternative Frameworks for Uncertainty Modeling." George J. Klir, a distinguished Professor of Systems Science at the T.J. Watson School at SUNY-Binghamton, presented his paper at the Second International Conference on Fuzzy Theory and Technology, held at Duke University in October, 1993. His paper was selected over nine others by an international panel of judges who are experts in fuzzy logic. The award includes a cash prize of US$ 2,500, a certificate and hotel accommodations for the Third Annual International Conference on Fuzzy Theory and Technology Nov. 13-16 1994 in Pinehurst, N.C., USA.

Zadeh, a professor emeritus at the University of California at Berkeley, is credited with inventing and coining the term *fuzzy logic* to describe a kind of mathematics that allows for degrees of uncertainty. Fuzzy logic has been incorporated into electronic devices that react to change with greater sensitivity. The first award went to Zadeh himself for his seminal 1965 paper: "Fuzzy Sets."

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BIOMEDICAL IMAGING

A World-Wide Web page of online list of Biomedical Imaging Conferences has recently been established. The page carries news of conferences, dates, locations, deadlines, a short description, and where to get additional information. It is aimed predominantly at workers in the biomedical image analysis field, but naturally has considerable overlap with other mainstream events. Hopefully, being an online list, it should be possible to keep track of late breaking events more easily in this fashion. The list is looked after by Charles Bird at Guy's Hospital in London and it can be accessed through the address **http://www-ipg.umds.ac.uk** If people wish to include announcements, they can email details to **c.bird@umds.ac.uk**, or use the form on the **www** page.

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Seventeen years ago, a 129-digit number was chosen as the basis for a code presumed to be impregnable because breaking the code would require factoring the number - a process that was thought to require 40 quadrillion years. Well, that was a miscalculation, (by about 40 quadrillion years minus 17).

New York Times 27 April 1994

CALL FOR PAPERS FOR A NEW JOURNAL: REAL-TIME IMAGING

Real-Time Imaging is the title of a new journal from Academic Press which will be published from January 1995. There will be six issues in the first year. The Journal will have a wide-ranging remit, covering among others the areas of image compression, target acquisition and tracking, remote control and sensing, virtual reality, multimedia, image enhancement and filtering, networking for real-time imaging, advanced computer architectures, computer vision, optical measurement and inspection, and simulation. There will be a cross-disciplinary emphasis. The Editors-in-Chief are Phillip A. Laplante of Fairleigh Dickinson University, and Alexander D. Stoyenko of New Jersey Institute of Technology. Roy Davies of Royal Holloway University of London has been appointed European Co-ordinating Editor. An important feature of the new journal will be the speed of review (expected to be 4-5 weeks) and of subsequent publication.

Authors should send a copy of their paper in LaTex, ASCII or other readable sources to **jrti@fdu.edu.** Alternatively, mail one original manuscript and three complete copies to: Alexander Stoyenko, Real-Time Imaging, PO Box 668, Millwood, New York 10546, USA. European authors may also submit papers (preferably 1 original + 3 complete copies of the m/s) directly to: Professor Roy Davies, European Co-ordinating Editor, Real-Time Imaging, Machine Vision Group, Department of Physics, Royal Holloway University of London, Egham, Surrey TW20 0EX, UK. Tel: +44 784 443497 Fax: +44 784 472794 email: **e.r.davies@rhbnc.ac.uk**

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WELCOME TO THE 32nd MEMBER OF IAPR: SOUTH AFRICA

The affiliation to IAPR of the Pattern Recognition Association of South Africa (PRASA) has been approved by the Governing Board. Membership is open to anyone in South Africa with an interest in pattern recognition or any related field. At present there are about 40 members from academic and non-academic institutions. There is an annual workshop with published proceedings to give members the opportunity to communicate their work to others in the field and the 5th such workshop will be held at the end of 1994.

Their Governing Board member and contact address is:
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GOVERNING BOARD DECISIONS

THE EXECUTIVE COMMITTEE HAS BEEN more than usually active during the last six months, (one meeting in London in March and one in Seattle in June). Several proposals have been made to the IAPR Governing Board (GB), and voting has been undertaken by mail. We have decisions on many important issues:

• The Awards committee has selected and proposed a candidate for the K.S. Fu Award 1994. The GB voted for this candidate and the Award will be presented at 12-ICPR in Jerusalem in October.

• Another novelty that was decided long ago but has only now been implemented, was to initiate an IAPR Fellowship for distinguished scientists who have given exceptional service to the community and to IAPR. The first group of IAPR Fellows will be announced at 12-ICPR in Jerusalem and will constitute about 0.5% of all IAPR members.

• A new Technical Committee has been established, TC-14: *Image Processing*. The Chair is Dr. Hans Knutsson, and interested members should contact him at: Dept of EE, University of Linköping, S-581 83 Linköping, Sweden. email: **knutte@isy.liu.se.**

• The Pattern Recognition Association of South Africa has been elected member number 32 in IAPR. (See opposite).

• IAPR has decided to sponsor the journal *Machine Vision and Applications* following a proposal put forward by the Publications and Publicity committee. MV&A has already been in active association with IAPR; there have been, or will be, special issues of selected papers from the IAPR Workshop on Machine Vision Applications, Tokyo 1992 and of the best papers from the Computer Architectures track of ICPR-1992. The sponsorship means, among other things, that IAPR members will get a substantial reduction in the subscription from 1995. There will be more information on this at a later date. (Naturally, this decision in no way affects the special realtionship between IAPR and Pattern Recognition Letters.)

• A number of European members proposed an IAPR European Coordinating Committee, to deepen the cooperation within Europe and to give our community a stronger voice. However, this proposal got a very mixed reception, and no majority has been reached either way. It seems many GB members think that the issues raised in the proposal are important, but that they should be addressed within the present IAFR framework, whereas others think a formal organisation would be a good idea. Many abstained from voting.

• Unfortunately it had become necessary to propose a raise of the IAPR dues for reasons of both inflation and increased IAPR activity. This proposal has now been carried. The very broad category B has been split, to make the charge per individual member more even. New dues are:

Category	Members	Dues/US$	Societies
A1	25-75	100	13
A2	76-200	200	6
B	201-400	500	8
B	401-800	1000	4
C	over 800	2000	1

There will be an extra charge of US$ 0.80 per individually mailed Newsletter per individual per year (4 copies).

Gunilla Borgefors, Secretary

Neural Networks: What shall we do about them?
A report from Technical Committee 3

This technical committee was only activated after the 11-ICPR in the Hague. The committee consists of Bob Duin, Nathan Intrator, Anil Jain, Michael Jordan, Hidemitsu Ogawa, Erkki Oja, Ari Visa, Harry Wechsler, and Lei Xu. No official meeting has yet been held, (the first will be in Jerusalem), but members have met for discussions at several conferences/workshops over the past year. It is hoped that new members will join at the 12-ICPR.

One active topic of discussion has been conference activity: should IAPR start conferences or workshops specifically devoted to neural networks? The general feeling among the TC3 members has been that we already have probably too many neural network conferences, so it is better to influence the field by: a) seeing that neural networks have their place in ICPR conferences, as they presently do; and b) taking part in organizing the well-established neural network conferences like the IEEE World Congress on Computational Intelligence (WCCI), and the ENNS International Conference on Artificial Neural Networks (ICANN). Members of TC3 are already involved in the TC on neural networks of the IEEE and within other neural network societies that handle the conferences. In this way, we can see that pattern recognition and computer vision get their share in neural network conferences where we can try to improve the general quality of PR related papers.

Another topic is standards and comparisons, e.g., is back-prop better or worse than nearest neighbors? To answer this question we need first, good test databases, and second, a working definition of what is a standard "Back-prop network" or "LVQ network" - the problem is that different results will be obtained by different training strategies, choices of parameters etc. I have started discussions with the standards committee of the IEEE who have exactly the same problem in mind. This matter will be seriously taken up at the Jerusalem meeting.

Erkki Oja, Chairman TC3

Directions for Pattern Recognition in Astronomy
A Point of View from Technical Committee 13

THE INCREASING integration in an astronomical setting of various methodologies in pattern recognition, information retrieval and data analysis is a characteristic of modern computational astronomy. Large astronomical databases and archives from space-borne missions, ground-based observatories, and large wide-field surveys, make this a necessity. Against this backdrop, boundaries between theoretical domains have been lowered.

One of the leading cases concerns the automated galaxy counts from digitized images (e.g. through the use of the COSMOS machine in Edinburgh, or with the MAMA machine in Paris), which lead to a fundamentally new vision of the Universe. As the number of objects we are talking about is in the tens of millions, the issues involved go considerably beyond image analysis and the problems raised are only solvable with pattern recognition and statistical methods. This leads to the use of large image databases and archives which necessitates new image retrieval and textual retrieval methods. The latter include both image-associated descriptive text, and also retrieval from bibliographic databases.

Modern astronomical retrieval systems allow seamless access to information in its varied forms (graphical, image, text, bibliographic, etc.), alongside semantic support (e.g. name resolvers). Cross-identification of large catalogues (IRAS, ROSAT, etc.) is also necessary, both for scientific analysis, and as an indispensable basis for missions (e.g. the Hipparcos Input Catalog, INCA). Cross-identification of data is one aspect; a further turn of the same spiral leads to the issue of the cross-correlation of information.

Finally, the images themselves have necessitated the integrated use of multiresolution image analysis, mathematical morphology and fuzzy object characterization. Thus, wavelet transform analysis is used for image restoration and filtering, with semantics built in through morphological operations on the transform. Fuzzy object characterization is a valuable interpretational facet.

The astronomical application domain offers a unique testbed for establishing strengths and limitations of these methodologies and it offers in addition an exportable model for other domains also. Astronomy is an on-line, nearly all-digital science, with high visibility, and a specifiable research community; these characteristics provide a fertile basis for dissemination of research results. In fact, for information distribution in astronomy, the World-Wide Web has become the de facto standard. The AstroWeb consortium (5 individuals at some of the major institutes in Europe, the US and Australia) has consolidated a common list of more than 1000 astronomical sites worldwide.

From all the above considerations, a very clear picture emerges concerning the future developments in the field:

First of all, data storage and access standards, together with interface standards, must be coordinated. Data characteristics, including dynamic aspects related to the life-cycle, have a strong impact on the methods for analysis and treatment. The astronomical data life-cycle is highly digital: data capture is increasingly on CCD electronic detectors, data are subject to image processing and statistical treatment, and the final major stage in this process involves (a) data archiving, and (b) publication. Not surprisingly, the issues of electronic publishing and of digital libraries are viewed as increasingly important.

But data is not only to be archived and disseminated, it has to be accessed and analysed and for this purpose one has to move from vision models to image information retrieval. Methods such as wavelets and multiresolution approaches, mathematical morphology, and fuzzy logic have proven their worth in the framework of accessing appropriate information from large image databases. Use of such methods in this context is not a purely engineering task (i.e. the methods are not simply stand-alone commands in an information retrieval framework). Rather, the methods must be moulded together to allow semantically-driven access to data. New methods, motivated by those mentioned, are required to handle the huge quantities of data which stand ready to be analyzed.
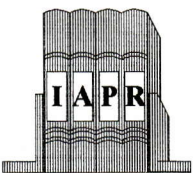
One level up is the use of all these data into the process of scientific inference. Thus, one has to move from the level of data integration to the level of information integration. Particularly, data integration (data fusion) problems, such as integration of data associated with different wavelength ranges, are of great relevance in the context of large space- and ground-based observing projects. In certain instances, this takes the form of co-addition in image restoration. It also includes the enhancement of image restoration and filtering approaches through building-in semantic information on the cosmic objects of interest. Close, complementary use of multi-million object astronomical catalogues still has some way to go in order to be tightly coupled with analysis of images from large image databases. Complementarity of such data rests on external information (semantics), and determines the appropriate analysis methodologies. Large-scale data integration prototypes have been pursued by NASA and ESA in recent years (the Astrophysical Data System, ADS; and the European Space Information System, ESIS, respectively), and these serve to point to *issues and concerns* which are solvable through improved methods.

Astronomers had to develop techniques for the classification of terabyte data collections, which include neural networks, decision/classification trees, and machine

learning approaches. And yet, widely reused code and paradigms have not yet evolved out of extensive astronomical work done in this area. Through coordination, this could be the case. Finally, the issue of long-term access to stored data, and the selection of the latter will soon have to be addressed. What should be, in the words of M.J. Kurtz, 'the future of memory' i.e. humanity's memory, which includes image data and other data? Ever greater quantities of data are collected; what should be (expensively) stored, and how should this be done? Photographic plate directories exist, and policies based on a range of theoretical issues are required for scanning and maintenance. Major projects collect many terabytes of data, and reuse is necessary, but also problematic. Compression is a byproduct of image models. Loss of information involved in compression raises a range of questions. In its broadest sense, compression is summarization, and therefore is part of the overall process of scientific analysis.

All these issues and more will have to be addressed in the future and it is hoped that international organizations like the International Astronomical Union (IAU) Commission 5 and Technical Committee 13 of the International Association for Pattern Recognition will help coordinate the process.

F. Murtagh
Chairman TC 13

Book IAPR Review

Handbook of Pattern Recognition & Computer Vision
Edited by C.H.Chen, L.F.Pau and P.S.P Wang
Published by World Scientific Publishing Co. 1993
984 pages ISBN 981-02-1136-8

This new handbook is the result of a combined effort of leading researchers from all major fields of pattern recognition and computer vision. The editors have aimed to reflect all new developments since 1986 when the previous Handbook of Pattern Recognition and Image Processing, edited by T.Y.Young and the late K.S.Fu (to whom the new handbook is dedicated) was published.

The progress in pattern recognition (PR), also influenced by renewed and intensive efforts on neural networks, and particularly in computer vision has been so extensive that it has become increasingly difficult for researchers to follow these new developments. Owing to the huge diversity and multidisciplinary character of the research issues involved, most researchers have specialized in certain topics. Though they all realize it would be extremely desirable to

get acquainted with other areas, it is impossible to digest necessary summary information from a vast amount of published papers. It is just this handbook which at last provides what the research community has lacked - much needed coverage of what has been developed in theory, techniques and algorithms, and the major applications of PR and computer vision, as well as hardware/architecture aspects of computer vision.

The book consists of only about 15 per cent of reprinted papers, the rest being original and unpublished work. It is organized into five parts. *Part 1* covers thoroughly basic methods in pattern recognition. Individual chapters are devoted to statistical PR, structural and syntactic PR, cluster analysis, large-scale feature selection and neural net computing for PR. *Part 2* provides both the basic methods and more recent developments in computer vision. Leading experts in the field provide, in mostly original papers, indepth presentation and discussion of topics like texture analysis, texture segmentation and classification, colour in computer vision, projective geometry, 3-D motion analysis, etc.

Several major applications of PR are presented in *Part 3*. It includes nondestructive evaluation of materials, recognition and interpretation of geophysical signals, character recognition, applications from medicine and biomedicine. Also very interesting applications in economics and business are contained, including the real-time stock trading, financial analysis and long-term economic analysis. *Part 4* contains unique applications in inspection and robotics. Individual papers treat applications of computer vision in the food industry, image information retrieval systems, context related issues in image understanding and also techniques for estimating the position of a robot.

Finally, *Part 5* surveys more general "system" aspects concerning architectures and technology. A reader can find fundamental papers on designing computer vision systems, optical pattern recognition for computer vision, perception of objects and the spatial relationship and knowledge representation in image databases, a computational approach to viewer-centered representations in object recognition, neural network architectures for low level image segmentation and architectures for image processing and computer vision. Finally, this part is concluded by a paper forecasting the future of image information systems.

All the papers contain an exhaustive list of references covering most of the work in the field of PR and computer vision. The handbook contains also a subject index facilitating the use of the book as a reference source. All this makes the Handbook of PR & Computer Vision an indispensable source of information for any researcher in the field (or even in application fields) and it should not be missing from any engineering or mathematical library.

Pavel Pudil
Czech Republic

WORKSHOP ON VISUAL BEHAVIOURS SEATTLE WASHINGTON USA 19 June 1994 [IAPR]

A TRULY INTERNATIONAL GROUP OF authors and participants met on 19 June 1994 for the Workshop on Visual Behaviours organised by the IAPR TC 4, Computer Vision and Image Understanding. The workshop began the week-long activities associated with CVPR'94 in Seattle, Washington, USA. It was a very good beginning with nearly 60 attendees from Europe and Japan as well as Canada and the United States.

The purpose of the workshop was to foster debate and dialogue on the fundamental issues involved in systems that tightly couple perception and behaviour to perform tasks. The day began with Jeff Pelz presenting his work with Mary Hayhoe and Dana Ballard on human visual behaviours associated with a *copy the model* task. Eye tracking was used to correlate the areas of visual attention with the hand movements constructing the copy. The investigation of the relationship between perception and action continued to be explored throughout the day from both the theoretical and experimental perspectives.
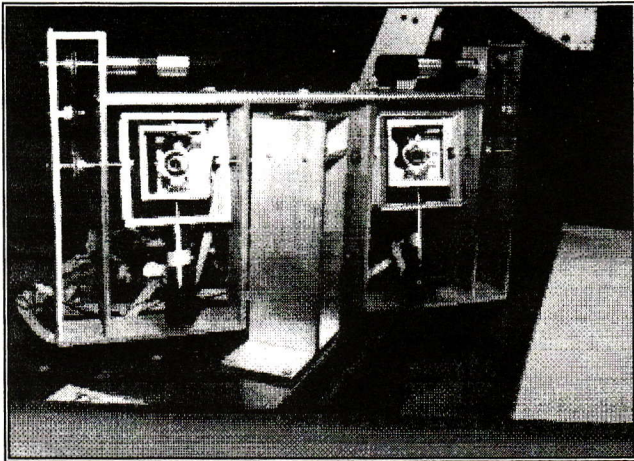
Several papers reported work with experimental *heads* comprising multiple moving cameras. This photograph shows TRISH, the 2 camera head, developed at the University of Toronto and York University by J Tsotsos, E Milios and M Jenkin. An agile camera head being developed at Aalborg University in Denmark was the basis for the work on vergence and localizing un-calibrated heads by Claus Anderson, Henrik Christensen and Claus Madsen. Ian Horswell presented a binocular head, the components for which almost anyone can afford to purchase. With an application topical to the World Cup in the USA, Minoru Asada presented a radio controlled vehicle equipped with a bumper that performed a version of soccer goal kicks; (co-authors: S Noda, S Tawaratsumida and K Hosoda).

Visual search was investigated in several papers including a *grocery shopper* presented by Dan Fu, Kristian Hammond and Michael Swain; the shopper system used colour as a search directing cue. Colour also played an important role in the system presented by E Grimson, L Ratan and P O'Donnell as well as in the system used by Rolf Schuster.

A novel search system was discussed by Frank Brill in which the video input for a mobile agent is derived from a dynamic viewpoint in an environment created by a virtual reality system. Trevor Darrell presented an environment in which autonomous (though virtual) agents can interact with a user; (co-authors: P Maes, B Blumberg and A Pentland).

In total, 18 papers were presented in a rather long day, but interest remained high and several informal groups continued discussions and demonstrations for another hour past the closing paper. Proceedings have been published and are available from IEEE CS Press or from W N Martin (**martin@virginia.edu**).

W N Martin
Virginia, USA

SECOND INTERNATIONAL WORKSHOP ON VISUAL FORM CAPRI ITALY 30 May - 2 June 1994 [IAPR]

About seventy researchers from more than a dozen countries participated in IWVF-2. This workshop is gradually bridging the gap between perceptual and mathematical notions of shape, and goal-oriented applications of computer vision. Both the invited and the contributed papers covered the range from the fundamental issues of the nature of shape to their manifestation in applications such as line drawing analysis, character recognition, facial expressions, medical images, and range data.

The conference was again organized by Carlo Arcelli, Luigi P. Cordella and Gabriella Sanniti di Baja. It was sponsored by the Dipartimento di Informatica e Sistemistica of the University of Naples and by the Institute of Cybernetics of the Italian National Research Council. A pro-active organizing committee, assisted by a distinguished scientific committee, set a very strong technical program consisting of eight invited papers (by D. Ballard, G. Borgefors, J.O. Eklundh, R.M. Haralick, R. Kasturi, T. Pavlidis, S. Peleg, S.W. Zucker), and about 50 contributed papers presented at interleaved lecture and poster sessions. Interest in the poster presentations was so strong that more space should be sought for a reprise.

Only abstracts and a list of participants were distributed; the proceedings of the Workshop are expected to be published before the end of the year by World Scientific, Singapore. Together with the first volume (Visual Form, Plenum, 1992), these proceedings will constitute a useful compendium of shape representation, extraction, decomposition, synthesis and analysis techniques.

The venues of the conference, including the many-terraced Punta Tragara Hotel and the L'Isola Congress Center

(which are separated by a delightful fifteen minute walk), enhanced close interaction among the participants. So did a thoughtfully planned social program culminating in a joint dance and music performance by the participants and a lively local tarantella band.

Participants learned all about

SNAKES
and
DEFORMABLE MODELS

Text: George Nagy   *Photos: Bob Haralick*

FROM 25 YEARS AGO

Only unimaginably expensive and massive computers even larger than those presently contemplated, can hope to accomplish such tasks with present components. On the other hand, Man, the biological competition, easily processes million-element pictures in full colour at reasonable speeds, is priced at a mere $20,000 by industry, and requires relatively few hours of on-the-job programming.

(Joseph K Hawkins
writing about automatic image screening)

PATTERN RECOGNITION IN PRACTICE VLIELAND THE NETHERLANDS
June 1-3, 1994 [IAPR]

The workshop on Pattern Recognition in Practice IV was held on the beautiful island of Vlieland during June 1-3, 1994. This was the fourth workshop of a series that goes back to May 1980 when the first workshop on *Pattern Recognition in Practice* was organized by Edzard Gelsema and Laveen Kanal.

The goal of this series of workshops has been to bring together a relatively small number of pattern recognition scientists and practitioners to exchange ideas and challenges facing the implementors of pattern recognition systems. To say the least, the organizers were successful in their goal and this participant returned from the workshop with a number of technical ideas as well as with some fond memories of a good time and masterful display of the organizing skills of the whole organizing committee.

The workshop was attended by 65 participants from 20 countries, giving it a true international flavor. The technical program consisted of 40 regular contributions and 4 short contributions. These contributions were presented in two day sessions and one evening session. The sessions were organized around themes such as artificial intelligence techniques in image processing and pattern recognition, Bayesian networks, genetic algorithms, hybrid systems, neural networks, and syntactic pattern recognition. Several application specific papers were part of many sessions and covered applications such as handwriting recognition, face recognition, magnetic resonance imaging, and SAR image classification.

Two sessions were devoted to comparative studies where some interesting results were presented on the relative performance of neural classifiers versus the traditional classifiers. Most of the presentations were of good quality and generated thought provoking discussions. The organizers had made arrangements to record these discussions which will appear as part of the proceedings in an edited volume to be published by North-Holland.

The social events in the workshop program consisted of a reception by the Mayor and Aldermen of Vlieland and a buffet dinner in The "Posthuys". The reception, held at the local museum, was a thoroughly pleasant affair. The buffet dinner at the Posthuys was a memorable event which began with a wild ride on the beach and ended with an excellent performance by the "Vlielander Zeemanskoor", the island's very own choir of seamen.

All in all, it was a great workshop to be at and I am looking forward to the next in the series. My only complaint is that I must wait another three years or so for the next one!

Ishwar K. Sethi
Wayne State University, USA

CONFERENCE ANNOUNCEMENTS

THE SMART SET

INTERNATIONAL CONFERENCES

Put me down to do some Pattern Recognition

on April the 27th..........

1996..........

PROFESSOR
V. SMART

between 2 and 3 o'clock!

Terry Fountain, London UK

VISION INTERFACE '95
Québec Canada
15-19 May 1995 [IAPR]

Vision Interface '95 is the 9th Canadian Conference devoted to computer vision, signal and image processing and pattern recognition. The meeting is sponsored by the Canadian Image Processing and Pattern Recognition Society (CIPPRS) and IAPR and the theme will be: *Machine Vision - Current and Future Applications.* Contributions are solicited describing unpublished research results and applications and submissions on the theme or following topics are welcome:

• Robot Vision
• 3-D Vision
• Sensor Fusion
• Surface Reconstruction
• Document Processing
• Remote Sensing
• Motion Detection
• Autonomous & Teleoperated Systems
• Industrial & Biomedical Applications
• Architectures for Computer Vision
• Neural Networks
• Knowledge Representation
• Non Destructive Testing
• Handwriting Processing & Recognition

Proceedings available from: Mrs D Barham, CIPS, 430 King Street W, Unit 106, Toronto, Ontario, Canada M5V 1L5. Email: DonBarham@mtsg.ubc.ca
Submit four copies of the full paper in English or French to Denis Poussart, Department of Electrical Engineering, Laval University, Québec, Canada G1K 7P4
Fax: +1 418 656 3594   Email: poussart@gel.ulaval.ca

Paper submission deadline:	**31 Oct 1994**
Acceptance notification:	**23 Jan 1995**
Final camera ready paper:	**15 Mar 1995**

5th INTERNATIONAL CONFERENCE ON IMAGE PROCESSING AND ITS APPLICATIONS
Edinburgh UK 3-6 July 1995 [IAPR]

This conference is the fifth in the successful series on image processing organised by the IEE and aims to provide a forum for the exchange of new results. Papers will be selected on the basis of technical quality, timeliness and potential stimulation of broad ranging discussion.   In addition to lecture theatre presentations, a selection of papers will be presented in poster sessions.

Paper categories:
• Image Communication:
• Image Interpretation
• Image Analysis
• Architecture
• Applications

Paper submission:
Submissions should be in the form of an abstract of about 1000 words and include:
     3-4 key words
     paper category
     indication of results and applications

Authors whose abstract is selected for further consideration will be required to provide a typescript of no more than 5 A4 pages (approx 5000 words, less if illustrations are included), submission of which must be accompanied by a deposit of UK £50 towards the conference registration fee.

Papers should be submitted to:
IPA95 Secretariat, IEE Conferences Services, Savoy Place, London WC2R 0BL, UK.
Fax: +44 71 497 3633   Email: conference@iee.org.uk

Paper submission deadline:	**28 Oct 1994**
Acceptance notification:	**Dec 1994**
Full typescript for final review:	**8 March 1995**

6th INTERNATIONAL CONFERENCE ON COMPUTER ANALYSIS OF IMAGES AND PATTERNS [IAPR]
Prague Czech Republic 6 - 8 September 1995

The scientific program will consist of contributed papers, plenary lectures by invited speakers, posters, book and technical exhibits.   Topics will include:

- Image Analysis
- Pattern Recognition
- Computer Vision
- Pictorial Recognition and Learning
- Human Vision Modelling
- Vision for Virtual World
- Active and Real Time Vision
- Applications

Paper submission: Submit four copies of a full length draft not longer than ten A4 or US Letter pages.   Cover page should contain: title, author's name, affiliation and address, phone/fax and email, and an abstract of not longer than 200 words.   If the paper is only submitted to the poster session, this should be clearly stated.

Further details from: CAIP'95 Secretariat, Václav Hlavác, Czech Technical University, Faculty of Engineering, Karlovo námestí 13, CZ-121 35 Prague 2. Fax: +42 2 290159 Email: caip95@vision.felk.cvut.cz

Paper submission deadline:	**1 Feb 1995**
Acceptance notification:	**15 Apr 1995**
Final camera ready paper:	**20 June 1995**

8th INTERNATIONAL CONFERENCE ON IMAGE ANALYSIS & PROCESSING
San Remo Italy [IAPR]
13 - 15 September 1995

The scientific program will include the presentation of invited talks and contributed papers.   Original, unpublished papers dealing with theoretical and application aspects in the following fields are welcome:

- Image Processing
- Image Understanding
- Image Synthesis
- Image Architectures
- Image Language and DBMS
- Application Domains

Paper submission: Submit four copies of a full paper to ICIAP Scientific Secretariat; papers should not exceed six A4 pages since this is the estimated length of the proceedings version.   The cover page should be anonymous, containing only the title of the paper, a 200-word abstract and 3-5 keywords.

A separate page, including the name(s) and affiliation(s) of the author(s), the abstract, the keywords and the addressed topic of the conference must accompany the paper.

Papers submitted by fax or email will not be reviewed.

Scientific Secretariat: Professor Leila De Floriani, ICIAP'95, DISI - University of Genova, Viale Benedetto XV, 3, I-16132 Genova, Italy

Paper submission deadline:	**2 Jan 1995**
Acceptance notification:	**31 Mar 1995**
Final camera ready paper:	**6 May 1995**

COMPUTER ARCHITECTURES FOR MACHINE PERCEPTION [IAPR]
Como Italy 18 - 20 September 1995

Topics will include:

- Distributed Perception Systems
- Industrial Applications
- Inference Engine/Machine Intelligence Architectures
- Languages, Software Environments/Prog. Tools
- Neural Network applications in machine perception
- Parallel Architecture and Algorithms
- Performance Evaluations
- Rule-based Systems/Knowledge-based Systems
- Signal and Image Processing Architectures
- Smart Sensors and Sensor Fusion
- Vision and Multisensor Perception
- VLSI Perception Systems

Paper submission: Four copies of extended abstract in 12 pt type, double-spaced, not exceeding 10 pages to: Alessandra Setti, Dip. di Informatica e Sistemistica, 27100 Pavia, Italy. Email: ale@ipvvis.unipv.it

Paper submission deadline:	**31 Jan 1995**
Acceptance notification:	**31 Mar 1995**
Final camera ready paper:	**30 Apr 1995**

3rd SCIENTIFIC CONFERENCE ON PATTERN RECOGNITION & IMAGE ANALYSIS [IAPR]
Minsk Belarus 19 - 21 September 1995

Topics will include, but are not limited to:

- Pattern Recognition
- Image Analysis
- Signal Processing
- Systems of Image Processing
- Parallel Architectures for Image Processing
- Application of Image Analysis for Ecological, Medical and other tasks

Paper Submission: Submit three copies, (2 for review, 1 as final paper if accepted), camera ready format in English, Russian or Belarusian of five A4 pages, 10 or 12 pt Times Roman. First page to include paper title, author(s) name(s), affiliation and text to: Prof S Ablameyko, Inst of Eng. Cybernetics, Belarusian Academy of Sciences, Surganov str 6, 220012 Minsk, Belarus.   Email: mahaniok%bas10.basnet.minsk.by@demos.su

Paper Submission deadline:	**15 Mar 1995**
Acceptance notification:	**1 July 1995**
Final camera ready paper	**as submitted in March**

FORTHCOMING CONFERENCES, WORKSHOPS AND EVENTS

1994	Event	Location	Contact [Sponsor]
3-7 Oct MP'94	2nd Int Workshop on Massive Parallelism	Capri, Italy	A Mazzarella, C di Napoli, Istituto di Cibernetica, Via Toiano 6, I-80072 Arco Felice, Napoli Italy. secyann@cib.na.cnr.it
4-6 Oct SSPR'94	Int Workshop on Syntactic and Structural PR	Nahariya, Israel	Ms Nilly Schnap, Faculty of Industrial Engineering and Management Technion , Israel Institute of Technology, Technion City, Haifa 32000 Israel. SSPR94@ie.technion.ac.il [IAPR]
9-13 Oct 12th ICPR	12th International Conference on PR	Jerusalem, Israel	12th ICPR, c/o International Ltd, 10 Rothschild blvd, 65121 Tel Aviv, Israel. icpr@math.tau.ac.il [IAPR]
13-15 Oct 3rd SDIDR	3rd Symposium on Digital Imaging in Dental Radioligy	Noordwijker-hout, Netherlands	Mrs Yvonne Emmer, Department of Oral Radiology, Academic Centre for Dentistry (ACTA), Louwesweg 1, 1066 EA Amsterdam, The Netherlands. radmail@sara.nl
18-20 Oct DAS94	Document Analysis Systems	Kaiserslautern, Germany	Andraes Dengel, German Center for Artificial Intelligence (DFKI), PO Box 2080, 6750 Kaiserslautern, Germany. DAS94@dfki.uni-kl.de [IAPR]
27-29 Oct ITW'94	Information Theory Workshop	Virginia, USA	Professor Prakash Narayan, Department of Electrical Engineering, University of Maryland, College Park, Maryland 20742, USA. prakash@eng.umd.edu
8-11 Nov ICARCV	Third Int Conference on Automation, Robotics and Computer Vision	Singapore	Assoc.Professor N Sundararajan, ICARCV'94 Conference Secretariat, Institution of Engineers, Singapore, 70 Bukit Tinggi Road, Singapore 1128, Republic of Singapore. ensundara@ntuvax.ntu.ac.sg
11-12 Nov WNAM	Workshop on Non-rigid & Articulate Motion	Austin, Texas, USA	Ms Debi Paxton, Computer Vision Research Center, University of Texas (ECE Dept), Austin, Texas 78712-1084, USA. dpaxton@emx.cc.utexas.edu
13-16 Nov ICIP-94	First IEEE Int Conf on Image Processing	Austin, Texas, USA	Conference Management Services, 3024 Thousand Oaks Drive, Austin, Texas 78746, USA. icip@pine.ece.utexas.edu
13-16 Nov JCIS	Fuzzy Theory & Tech/ Comp Theory & Informatics	N Carolina, USA	Joint Conf on Information Sciences, Paul P Wang, Department of Electrical Engineering, Duke University, Durham, North Carolina 27708-0291 USA. ppwee@duke.edu
14-17 Nov SPICIS '94	Second Singapore International Conference on Intelligent Systems	Singapore	Dr Looi Chee Kit, SPICIS '94, c/o Japan-Singapore AI Centre, 75 Science Park Drive , 01-01-04, Cintech II, Singapore 0511. cheekit@iti.gov.sg
20-25 Nov ISITA '94	Int Symposium on Information Theory/ Applications	Sydney, Australia	The Convention Manager, ISITA '94, AE Conventions Pty Limited, PO Box E181, Queen Victoria Terrace, ACT 2600 AUSTRALIA. Fax: +61 6 273 2012
5-7 Dec WACV	2nd IEEE Workshop on Applications of Computer Vision	Florida, USA	Bruce Flinchbaugh, Texas Instruments MS 238, 13510 N Central Expressway, Dallas, Texas 75243, USA.
7-9 Dec WFHR	4th Int Workshop on Frontiers of Handwriting Recognition	Taipei, Taiwan	Professor Hsi-Jian Lee, Chairman Dept Computer Science & Information Engineering, National Chiao University, 1001 Ta Hsueh Road, Hsin Chu 30050, Taiwan, ROC. hjlee@hjlee.csie.nctu.edu.tw [IAPR]
13-15 Dec MVA'94	IAPR Workshop on Machine Vision Applications	Kawasaki, Japan	Professor M Takagi, Institute of Industrial Sciences, University of Tokyo, 7-22-1 Roppongi, Minato-ku, Tokyo 106 Japan. takagi@tkl.iis.u-tokyo.ac.jp [IAPR]
15-17 Dec ISANN	1994 Int Symposium on Artificial Neural Networks	Tainan, Taiwan	Prof P C Chung, Dept Electrical Engineering, National Cheng-Kung University, Tainan, Taiwan, ROC. pcchung@eembox.ncku.edu.tw
1995	**1995**	**1995**	**1995**
4-7 Jan 3rd-ICAIA	Third International Conference on AI	Cairo, Egypt	Prof A Goneid, Dept Comouter Science, The American University in Cairo, 113 Kasr Al Aini Street, PO Box 2511, Cairo Egypt. Goneid@EGAUCACS.bitnet
12-15 Feb ISCCP-C	ISCC Pan-Chromatic Conference	Virginia, USA	Steve Shafer, Computer Science Department, Carnegie-Mellon University, Pittsburg, PA 15213, USA. sas@cs.cmu.edu

Please inform the Secretariat of any revisions or additions to this information.
66 Weston Park, Thames Ditton, Surrey KT7 0HL, UK.   Email: 100042.511@compuserve.com

1995	Event	Location	Contact [Sponsor]
23-24 Mar RecPad'95	7th Annual Conference on Pattern Recognition	Aveiro, Portugal	RecPad'95, António Sousa Pereira, Dept. Electrónica e Telecomuniçoes, Universidade de Aveiro, 3800 Aveiro, Portugal. recpad95@inesca.pt
27-29 April WGMICV	Europe-China Workshop on Geometrical modelling	Xi'an, China	Prof R Mohr, LIFIA INRIA, 46 Avenue F Viallet, 38031 Grenoble Cedex, France. Mohr@imag.fr
8-12 May ICASSP-95	Int Conf/Acoustics, Speech and Signal Processing	Detroit, USA	ICASSP-95, Diversified Management Services, PO Box 265, Eaton Rapids, MI 48827-0265, USA.
15-19 May VI'95	Vision Interface'95	Quebec, Canada	Denis Poussart, Department of Electrical Engineering, Laval University, Québec, Québec, Canada G1K 7P4. poussart@gel.ulaval.ca [IAPR]
6-9 June 9SCIA	9th Scandinavian Conference on Image Analysis	Uppsala, Sweden	9SCIA, Centre for Image Analysis, Lägerhyddsvägen 17, S-752 37 Uppsala, Sweden. scia9@cb.uu.se [IAPR]
20-22 June WNSIP	1995 IEEE Workshop on Nonlinear Signal and Image Processing	Halkidiki, Greece	Professor Ioannis Pitas, Department Electrical & Computer Eng., Aristotle University of Thessaloniki, PO Box 463, 54006 Thessaloniki, Greece. pitas@vergina.eng.auth.gr
20-23 June 5ICCV	Fifth International Conference on Computer Vision	Cambridge, MA, USA	Eric Grimes, Artif. Intell.Lab, 545 Technology Square, Mass. Inst of Tech., Cambridge MA 02139, USA. Fax: +1 617 258 6287
3-6 July IPA95	5th Int Conference on IP/applications	Edinburgh, UK	IPA95 Secretariat, IEE Conference Services, Savoy Place, London, WC2R 0BL, UK. conference@iee.org.uk [IAPR]
5-9 Aug IROS'95	IEEE/RSJ Int Conf on Intelligent Robots and Systems	Pittsburg, USA	Patricia Mackiewicz, School of Computer Science, Carnegie-Mellon Univeristy, 5000 Forbes Avenue, Pittsburg, PA 15213-3891 USA. patty@cs.cmu.edu
10-11 Aug GRec95	IAPR Workshop on Graphics Recognition	Pennsylvania USA	Professor R Kasturi, Dept Computer Science & Engineering, Penn State University, University Park, Pennsylvania 16802, USA. kasturi@cse.psu.edu [IAPR]
14-16 Aug ICDAR '95	3rd Int Conf/ Document Analysis and Recognition	Montreal, Canada	Professor R Kasturi, Dept Computer Science & Engineering, Penn State University, University Park, Pennsylvania 16802 USA. kasturi@cse.psu.edu [IAPR]
6-8 Sept CAIP'95	6th Int Conference Computer Analysis of Images and Patterns	Prague, Czech Republic	Vaclav Hlavac, Czech Technical University, Faculty of Electrical Engineering, Department of Control Engineering, Karlovo namesti 13, CZ-121 35 Prague 2, Czech Republic. caip95@vision.felk.cvut.cz [IAPR]
13-15 Sept ICIAP '95	8th International Conference on Image Analysis and Processing	San Remo, Italy	Professor Leila De Floriani, ICIAP '95, University of Genova, Viale Benedetto XV 3, I-16132 Genova, Italy. iciap@dibe.unige.it [IAPR]
17-22 Sept ISIT'95	Symposium on Information Theory	Whistler, Canada	Prof I Blake, Dept Elec Comp Eng, University of Waterloo, Waterloo, Ontario, Canada N2L 3GI. ifblake@claude.uwaterloo.ca
18-20 Sept CAMP'95	Computer Architectures for Machine Perception	Como, Italy	Alessandra Setti, Dip. di Informatica e Sistemistica, Via Abbiategrasso 209, 27100 Pavia, Italy. ale@ipvvis.unipv.it [IAPR]
19-21 Sept PRIA'95	Third Scientific Conference on PR and Image Analysis	Minsk, Belarus	Professor S Ablameyko, Institute of Engineering Cybernetics, Belarusian Academy of Sciences, Surganov str 6, 220012 Minsk, Belarus. mahaniok%bas10.basnet.minsk.by@demos.su [IAPR]
9-13 Oct ESSRS II	European Symposium on Satellite Remote Sensing II	Florence, Italy	The Europto Series, Direct Communications GmbH, Att. Ms Susan Jones, Xantener Str 22, 10707 Berlin, FR Germany. (Jones)100140.3214@compuserve.com
11-13 Dec ICSC'95	Computer Science Conf/Image Analysis Applications and Graphics	Hong Kong	Professor R T Chin, Department of Computer Science, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon Hong Kong. roland@cs.ust.hk

YEAR AT A GLANCE CONFERENCE PLANNER

Contact Details on pages 10-11   Previous Reports - volume and number shown in brackets

● = submission date
■ = final paper deadline
dates = meeting dates

(Oct–Dec = 1994; Jan–Sept = 1995)

Conference	Location	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
MP'94	Capri	3-7											
SSPR'94 (v16 n2)	Nahariya	■4-6											
12th ICPR (v16 n1)	Jerusalem	9-13											
3rd SDIDR	Noordwijkerhout	■13-15											
DAS94	Kaiserslautern	18-20											
ITW'94 (v16 n3)	Virginia	27-29											
ICARCV'94	Singapore		8-11										
WNAM	Austin		11-12										
ICIP-94 (v16 n1)	Austin, Texas		13-16										
JCIS	North Carolina		13-16										
SPICIS '94 (v16 n1)	Singapore		14-17										
ISITA '94	Sydney		20-25										
WACV (v16 n2)	Sarasota, Florida			5-7									
WFHR (v16 n3)	Taipei			7-9									
MVA'94 (v16 n2)	Kawasaki	■1		13-15									
ISANN (v16 n3)	Tainan			15-17			27-29						
3rd-ICAIA	Cairo		■15		4-7								
ISCCP-C	Virginia					12-15							
RecPad'95	Aveiro		●14				23-24						
WGMICV (v16 n3)	Xi'an		●15	■31									
ICASSP-95	Detroit						■1		8-12				
VT'95	Quebec	●31					■15		15-19				
9SCIA (v16 n3)	Uppsala	●24				■28				6-9			
WNSIP (v16 n3)	Halkidiki		●1				■1			20-22			
5ICCV (v16 n3)	Cambridge, MA		■15							20-23			
IPA95	Edinburgh	●28					■8				3-6		
IROS'95	Pittsburg											5-9	
GRec95 (v16 n3)	Pennsylvania			●15				■15				10-11	
ICDAR '95 (v16 n3)	Montreal			●1					■1			14-16	
CAIP'95	Prague					●1				■20			6-8
ICIAP '95	San Remo				●2				●6				13-15
ISIT'95	Whistler				●1			■30					17-22
CAMP'95	Como				●31								18-20
PRIA'95	Minsk							●15					19-21
ESSRS II	Florence										■1		
ICSC'95	Hong Kong							●15					■15