



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

NEWSLETTER

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FROM THE EDITOR'S DESK

Apart from the prompt and apt conference and workshop reports this issue of the IAPR Newsletter may not be most memorable by its content as it primarily contains calls for papers for future events in the field. Yet for me it represents an important milestone and an opportunity to bid farewell to the IAPR community. It is now four years since I took over the editorship of the Newsletter and it is timely for new blood with fresh ideas and unadulterated enthusiasm to be brought in.

Paging through the past issues with a degree of nostalgia I find it difficult to pin point any major journalistic achievements over the four year period. Perhaps the main one is the regularity of publication of the Newsletter which hopefully contributed to the feeling of life and fellowship in the IAPR. Perhaps the Newsletter can achieve much more than that and my successor Dr Adrian Clark from the University of Essex will have the first opportunity to prove it. I wish him well and look forward to receiving the first issue under his editorship.

As probably for any Editor, the arrival of the new issue from the printer is like a drug for which one is

prepared to suffer all the frustration of its production: the lack of exciting material, the capriciousness of the word processing facilities, the drain on the meager human resources, etc. In order to minimize any potential withdrawal effects Professor Michael Duff, the new president of the IAPR switched me over to a much milder drug, by appointing me to the post of the Chairman of the Publications and Publicity Committee. This new role will give me a chance to interact with the Newsletter very closely and through the Newsletter with its readership. But as my direct contact with you terminates now I do wish to take this opportunity to convey my best wishes to all of you and thank you for the support and encouragement you gave me over the years.

The Editor

NEWS IN BRIEF

NEW IAPR PRESIDENT At their biennial meeting the IAPR Governing Board unanimously elected Prof M J B Duff (UK) as the President of IAPR for the 1990-1992 session. Dr G Borgefors (Sweden) is the IAPR Secretary, Prof S Levialdi (Italy) becomes the First Vice President, Dr M Ejiri (Japan) the Second Vice President and Prof J K Aggarwal (USA) retains the post of the Treasurer.

12TH ICPR Jerusalem, Israel, will be the venue of the 12th ICPR to be held in 1994.

CONFERENCE REPORTS

1ST EUROPEAN CONFERENCE ON COMPUTER VISION

Juan les Pins, France - April 23-26, 1990

The main conference was attended by about four hundred participants and was sandwiched between two ESPRIT sponsored workshops. This report presents some personal impressions of the main conference.

Opening the conference, Chairman Olivier Faugeras pinpointed two unifying themes. The first concerned the topical focus of vision research in the areas of shape and motion interpretation. The second theme was methodological and concerned the increasing mathematical sophistication required for the study of vision. In many ways the second theme was the dominant one. The conference highlighted a number of very nice pieces of theoretical research. The only weakness was probably a lack

of results to show what impact this work was likely to have on practical vision systems.

Topically, the conference concentrated on the analysis of shape and motion. Shape description having four sessions and motion analysis six. The remainder of the programme was devoted to image-features, matching and stereo. All of the work was of a high standard, for the most part presented in a lucid and accessible way. The bulk of the programme took the form of a plenary track; only three of the thirteen sessions took place in parallel. Sixty papers were presented orally with an additional twenty allocated to a poster session. Authors were predominantly based in the European Community, Scandinavia and North America.

Work on 3D shape description and recovery covered both range-volumetric and contour-based approaches. Some noteworthy ideas included the use of deformable part-models, charting surface structure using smoothness constraints, the inference of projective invariants, and, the tracking of extremal shape contours using snakes. Steve Zucker deserves a mention for the dexterity with which he animated the parts and protrusions approach using playdough.

Motion and tracking are by no means my area of interest. Even so I found some highly interesting talks in these sessions. John Aloimonos argued for the 'purposeful' paradigm in active vision. This favours the evolution of goal-directed vision processes over more generalised ones. The approach was nicely demonstrated on a real-time tracking problem. In a talk that spanned both shape and motion, Olivier Faugeras presented a method for tracking 3D curves using geometric features of the spatio-temporal surface.

Work on matching and recognition was represented at a variety of levels. At the lower-level there were several papers on accumulator-based model matching. Higher level approaches included work on consistent labelling and the application of ATMS for feature-labelling.

The edge-industry showed no sign of recession and dominated the sessions on image-features. Work reported included multiscale contour linking, a comparison of different optimality criteria and work on 3D edge detection. One idea gaining in popularity was the use of phase rather than amplitude as the basis for characterising image features. This concept was evoked in connection with scale-space representation and also in stereo feature matching.

Faugeras' second theme was exemplified by ideas surfacing in different topical areas. One example was the extent to which speakers were using methods from

differential geometry for both shape and motion analysis. Evidence for the interest in this area could be found at the conference book-shelf where Jan Koenderinks "Solid Shape" began to look decidedly dog-eared. Another such theme was the increased interest in Bayesian approaches. One paper argued for their use as an alternative to symbolic strategies in high-level vision. Mean field-theory approaches presented an interesting way of reconciling stochastic and mechanistic approaches to scene reconstruction.

The organisers are to be congratulated on putting together a high-quality technical programme and providing Europe with a vision forum of international excellence. My only suggestion for improvement would be for the addition invited review talks to the programme. Notwithstanding this, the good news is that there is to be a second conference in the series. It will be held in Genoa in 1992. Hopefully the precedent of a Mediterranean venue will be strictly maintained throughout the series.

Edwin Hancock

SERC Rutherford Appleton Laboratory, UK

IAPR WORKSHOP ON SYNTACTIC AND STRUCTURAL PATTERN RECOGNITION

Murray Hill, NJ, USA - June, 13-15, 1990

During 13-15 June, the IAPR Workshop on Syntactic and Structural Pattern Recognition, SSPR'90, was held in Murray Hill, New Jersey, USA. This is the latest in a series of bi-yearly workshops held in this technical area, sponsored by IAPR Technical Committee 2 on Syntactic and Structural P.R. This year, the general workshop chairman, Henry Baird of AT&T Bell Laboratories, chose to place special emphasis on document image analysis, and the workshop was co-sponsored by TC-11 on Text Processing accordingly. Many of the attendees were assisted by special grants to the workshop from the IAPR and the U.S. National Science Foundation.

This was an intensive, 100%-participation workshop: each attendee was required to submit a formal written technical contribution. Thirty refereed full papers were accepted for long presentations, and 27 abstracts for shorter presentations. The 63 attendees represented 12 countries: about 1/4 from Asia, 1/4 from Europe, and 1/2 from North America. Fully one-third of the attendees were industrial researchers. This unusually large industrial presence was especially satisfying, and is evidence of the commercial growth of document

image processing and the relevance of research to the next generation of algorithms and systems.

The workshop was organized into morning plenary sessions with talks and panels, and afternoons for break-outs into smaller working groups. The plenary session topics were: Syntactic Methods, Syntactic Applications, Image Feature Extraction, Handwriting, 2D and 3D Structure, Printed Documents, Graphics and Technical Drawings, and Music Notation. There were ten working group sessions in total, five held on each of the first and last afternoons. These were parallel sessions, each attended by ten to twenty people, and the topics were similar to those of the plenary sessions. The working group sessions were intended for researchers to discuss face-to-face and at length their current research and directions for the future. Each working group was assigned the task to draw up two lists, of open problems and proven methods. In addition to these sessions, on the afternoon of the second day attendees were given the opportunity to visit the AT&T Bell Labs Murray Hill facility.

The morning of the first day consisted of sessions on syntactic pattern recognition. Leading nicely into a panel session was a talk by Kakuma and Tanaka entitled, "A pessimistic view of syntactic pattern recognition". The panelists, Theo Pavlidis, Dov Dori, Horst Bunke, and Eiichi Tanaka, debated the utility of syntactic pattern recognition, and concluded that it was useful but not a panacea.

The plenary sessions on the second day dealt with extraction of features for pattern recognition, recognition of symbols, and use of features for handwriting recognition and 2D and 3D structure. On that afternoon, the Bell Labs tour took place. The large majority of workshop attendees made this visit. The tour began with the requisite "official welcome" where facts were given on employee size (about 30,000), budget (\$3 billion per annum), number of patents (30,000) and number of Nobel Prizes (7). After this, four demonstrations were given of Bell Labs research relating to the workshop: printed page reading (Henry Baird), handwritten numeral recognition by neural networks (Yann Le Cun), equation recognition (Philip Chou), and page layout analysis for an electronic library system (Larry O'Gorman). That evening at the workshop banquet, the invited speaker was Gary Herring, Director of the Office of Advanced Technology of the U.S. Postal service. He described the vast scale and daunting difficulty of the document-image analysis tasks facing the world's postal services, and challenged the audience to tackle them.

On the final day, plenary sessions focused on systems-level pattern recognition problems, including prin-

ted-document, technical-drawing, and music-notation recognition. This latter session was a new application to many of the attendees and was especially interesting because of this. The final five working groups met in the afternoon; then, in a general plenary session, a representative of each of the ten working groups summarized their findings.

The printed Pre-Proceedings of the workshop contains 500 pages of refereed technical contributions. (A few extra copies are available. Contact: Henry Baird hsb@research.att.com.) Selected papers from the workshop, together with the reports of the working groups and special invited tutorial material, will be published in a book with the working title *Structured Document Image Analysis*, co-edited by Drs. H. Baird, H. Bunke, and K. Yamamoto.

This workshop gave the attendees an excellent opportunity to become acquainted with new work and to share ideas with their counterparts. It was generally agreed that the fields of syntactic and structural pattern recognition are healthy and making progress on important problems, and that document image analysis is an important and growing area for the application of these methods. The next SSPR workshop will be held in France in the fall of 1992.

Larry O'Gorman

AT&T Bell Labs, Murray Hill, NJ, USA

10TH INTERNATIONAL CONFERENCE ON PATTERN RECOGNITION

Atlantic City, NJ, USA - June 18-21, 1990

Opening this conference, Ed Cohen, Executive Director of the New Jersey Commission on Science and Technology, presented some statistics about the state. These were impressive but omitted to mention the only name that I can associate with New Jersey - that of Bruce Springstein. As the conference proceeded I became aware of a second New Jersey notoriety omitted from the list- Donald Trump. This name was not just to be seen written across almost every casino or hotel in Atlantic City. Daily reports across the front page of the New York Times detailed the failing health of his financial empire.

There seemed to be no omissions from the statistics presented by Herb Freeman, the ICPR Chairman. These underlined the health of the ICPR as an international event. Over 700 papers were submitted. The technical quality was high; about 50% of the papers being accepted for presentation either orally or as posters.

In his address IAPR president Martin Lavine, explained the decision to organise the 10th ICPR as an umbrella event. Rather than having a single programme committee, the conference was divided into four parallel specialist subconferences. Each subconference had its own programme chairman and committee. Professor Lavine also mentioned that pattern recognition societies in Australia, Bulgaria and the GDR have become IAPR affiliates. Another piece of good news was that many of the rifts with the Chinese pattern recognition community have been reconciled following the difficulties with the 9th ICPR.

There was a single plenary event in the programme. This was the presentation of the King Sun Fu award followed by the recipients lecture. The winner was Professor R L Kashyap of Purdue University. Announcing the decision of the award committee, Jack Sklansky described Professor Kashyap's very impressive contributions to the study of pattern classification and vision. These include linear discriminant analysis, machine learning, stochastic approximations, 2-D image models and robust methods for image analysis. His publication record is equally impressive; he has authored over 300 papers, 90 of which are in archival journals, and one book. Professor Kashyap then presented a lecture entitled "Three Decades of Pattern Recognition" in which he explored some of the themes of his research in more detail.

The remainder of the programme consisted of the four parallel subconferences. These were devoted to computer vision, pattern recognition, signal processing and architectures. Although this was probably a good way to partition the interests of ICPR attendees, the subconferences were certainly not exclusive in terms of topical coverage. For instance shape recognition, edge detection and neural networks were discussed in several tracks. For this reason I think the original suggestion of individual registration for each subconference would not have been a success.

My own interests were mainly covered in the vision and pattern recognition tracks. In the vision area there were good sessions devoted to curvature, shape, and texture. Of less direct interest to me, but of no less importance, were the sessions on motion, active vision and 3-D vision. In the pattern recognition stream I particularly enjoyed the sessions on pattern recognition methodology and on topics from low-level image interpretation (shape, texture and lines).

In addition to submitted papers, the vision track included some invited talks. The session entitled "Current and Future Problems in Motion" consisted talks by

Jake Aggarwal, Yianis Aloimonos and Tom Huang followed by a panel discussion. All three speakers presented strong individual views on the topic, while managing to provide a clear overview for the non-specialist.

Another panel session was devoted to "Machine Vision in the 90's: Applications and How to Get There". In a lively discussion, panelist Bob Haralick remarked that vision was currently dominated by academic research and was weak on application. Contributions from the audience revealed strong empathy for this point of view.

Overall, the technical programme was definitely more coherent than in the past. Of the three ICPR's that I have attended this was probably technically the best. This is attributable largely to the decision to organise this year's ICPR as an umbrella event. However I would criticise the sometimes eclectic grouping of talks. I attended a session in the signal processing stream entitled "Coding II". Here I was astonished to find Pierre Devijver segmenting motion sequences using Markov models and Gosta Granlund presenting work on visual representations for associative memory. Great stuff but the connection with image coding eluded me.

As for improvements, what is still lacking in the programme is the concept of a review talk. We are working in a dynamic rapidly changing field. A major international event such as ICPR, should not only provide a chance to hear high quality presentations of individual research results, but also to set some of these in perspective. The panel-sessions and invited talks go some way to meeting this, but there is still scope for rapporteur reviews that set progress in our field in a wider context.

Although technically very good, the conference venue was a disappointment. If like me you suffer from an ingrained calvinist attitude towards gambling, it was difficult to derive much enjoyment from Atlantic City. There was little else to do (apart from attending the ICPR of course!).

Finally, a question to the organisers. Was the prohibition banquet inspired by a nostalgic yearning for the days when gambling was illegal in New Jersey?

Edwin Hancock

SERC Rutherford Appleton Laboratory, UK

CALLS FOR PAPERS

VISION INTERFACE '91

Calgary, Alberta, Canada - June 3-7, 1991

Program

This is the 5th Canadian Conference devoted to Computer Vision, Pattern Recognition and Image Processing sponsored by the Canadian Image Processing and Pattern Recognition Society. Contributions describing unpublished results and applications are solicited in the following areas:

- Image understanding and recognition
- Speech understanding and recognition
- Computer vision
- Image processing
- Pattern analysis and classification
- Multisensor data fusion
- Active perception

Deadlines

Oct 31, 1990	Full papers (4000 words, 5 copies)
Feb 1, 1991	Authors notified
March 29, 1991	Camera-ready manuscript

Submission

Colin Archibald
Laboratory for Intelligent Systems
National Research Council
Bldg. M 50
Montreal Road
Ottawa
Ontario K1A 0R8
Canada

COMPUTER VISION AND PATTERN RECOGNITION 1991

Maui, Hawaii - June 3-6, 1991

Program

The program of this IEEE Computer Society Conference will consist of high quality papers on all aspects of computer vision and pattern recognition. Accepted papers will be presented as long papers in a single track, short papers in two parallel tracks and poster papers.

Deadlines

Nov 12, 1990	Full papers (30 pages, 4 copies)
Feb 15, 1991	Authors notified
March 15, 1991	Camera-ready manuscript

Submission

Prof G Medioni
Institute of Robotics and Intelligent Systems
PHE 204, mc 0273

University of Southern California
Los Angeles
CA 90089-0273
USA

IEEE Workshop on DIRECTIONS IN AUTOMATED CAD-BASED VISION

Maui, Hawaii - June 2-3, 1991

Program

The purpose of this workshop is to foster dialogue and debate which should sharply focus attention on important unsolved problems in CAD-based vision. A list of possible themes includes:

- Derivation of vision-oriented object models from CAD models
- Model driven execution of relevant features from images
- Strategies for matching image features to object models
- Capabilities of current CAD-to-vision systems
- Qualitative vision and automated learning

Deadlines

Jan 1, 1991 Full papers (25 pages, 3 copies)
March 1, 1991 Authors notified
April 1, 1991 Camera-ready manuscript

Submission

Prof Kevin Bowyer
Dept Computer Science & Engineering
University of South Florida
Tampa
Florida 33620
USA

INTERNATIONAL CONFERENCE ON ARTIFICIAL NEURAL NETWORKS

Espoo, Finland - June 24-28, 1991

Program

Theories, implementations and applications of Artificial Neural Networks are progressing at a growing speed both in Europe and elsewhere. This conference will be a major international forum for experts from academia and industry worldwide.

- Mathematical theories of networks and dynamical systems
- Network architectures and algorithms
- Artificial associative memories
- Pattern recognition and signal processing
- Self-organization

Deadlines

Jan 15, 1991 Full papers (6 pages)
May 15, 1991 Camera-ready manuscript

Submission

For more information and instruction for submitting manuscripts, please contact

Prof Olli Simula
ICANN-91 Organization Chairman
Helsinki University of Technology
SF-02150 Espoo
Finland

6th INTERNATIONAL CONFERENCE ON IMAGE ANALYSIS AND PROCESSING

Como, Italy - September 4-6, 1991

Program

The conference is organized by the Italian Chapter of the IAPR. Contributions are invited in the following areas.

- Parallel architectures for image processing
- Human perception and computer vision
- Shape analysis and recognition
- AI techniques in PRIP
- Image processing algorithms
- Data structures and representations
- Neural networks for image analysis

Deadlines

March 1, 1991 Extended abstract (4 pages, 4 copies)
May 15, 1991 Authors notified
Sept 4, 1991 Camera-ready manuscript

Submission

Marco Ferretti
Dipartimento di Informatica e Sistemistica
Universita degli Studi di Pavia
Via Abbiategrasso 209
I-27100 Pavia
Italy

9th KOBE INTERNATIONAL SYMPOSIUM ON ELECTRONICS IN INFORMATION SCIENCES

Kobe, Japan - June 18-19, 1991

Program

The symposium will cover the following topics:

- Video signal processing and HDTV
- Image processing and applications

- Image data bases

Deadlines

Oct 30, 1990	Abstract (300 words)
Dec 30 , 1990	Authors notified
March 28, 1991	Camera-ready manuscript

Submission

Prof Kotaro Horano
Faculty of Engineering
Kobe University
Rokko, Nada
Kobe
Japan

7th SCANDINAVIAN CONFERENCE ON IMAGE ANALYSIS

Aalborg, Denmark - August 13-16, 1991

Program

The conference is organized by the Pattern Recognition Society of Denmark and sponsored by IAPR. The conference topics include:

- Image analysis and interpretation
- Pattern recognition
- Computer vision
- Parallel algorithms and architectures
- Applications
- Neural nets

Deadlines

Dec 1, 1990	Full papers (8 pages, 4 copies)
March 1, 1991	Authors notified
May 1, 1991	Camera-ready manuscript

Submission

Prof Peter Johansen
Department of Computer Science
University of Copenhagen
Universitetsparken 1
DK 2100 Copenhagen O
Denmark

INTERNATIONAL WORKSHOP ON VISUAL FORM

Capri, Italy - May 27-30, 1991

Program

The program will include invited and contributed papers, panel discussions and poster sessions. The topics include:

- Shape perception and recognition
- Shape representation and description
- Shape from X

Deadlines

Dec 1, 1990	Full papers (4000 words, 5 copies)
March 15, 1991	Authors notified
May 27, 1991	Camera-ready manuscript

Submission

Dr Gabriella Sanniti di Baja
Istituto di Cibernetica CNR
80072 Arco Felice
Napoli
Italy

IEE 2ND INTERNATIONAL CONFERENCE ON ARTIFICIAL NEURAL NETWORKS

*Bournemouth, United Kingdom
- November 18-20, 1991*

Program

The principal objective of the conference is to provide a forum for discussion of recent advances in the field, to review progress and highlight key directions for artificial neural network research. The conference will cover four principal areas of interest:

- Architectures for artificial neural networks
- Learning algorithms
- Implementations
- Applications (vision, speech, etc.)

Deadlines

March 28, 1991	Paper synopsis (2 A4 pages)
May, 1991	Authors notified
July 31, 1991	Full paper (4000 words)

Submission

ANN 91
IEE Conference Services
Savoy Place
London WC2R 0BL

CALENDAR OF EVENTS

<i>Date</i>	<i>Event</i>	<i>Location</i>	<i>Sponsor/Information</i>
September 17-20, 1990	Applied Optics and Opto-Electronics	Nottingham, UK	Applied Optics and Opto-Electronics, Applied Optics Group, Blackett Laboratory, Imperial College, London SW7 2BZ
September 18-21, 1990	5th European Signal Processing Conference	Barcelona, Spain	EUSIPCO-90, Dept Teoria de la Senal y Comunicaciones, ETSITB - UPC, Apdo 30002, 08080 Barcelona, Spain
September 19-22, 1990	4th International Conference on Artificial Intelligence	Varna, Bulgaria	Dr Christo Dichev, AIMS 90, ITKR - Bulgarian Academy of Sciences, Bl. 29 A, Acad. G Bonchev St., 1113 Sofia, Bulgaria
Sept 24-27, 1990	British Machine Vision Conference 1990	Oxford, England	Dr RW Series, RSRE, St Andrews Rd, Malvern, Worcs. WR14 3PS, U.K.
October 2-4, 1990	Visual Communications and Image Processing 90	Lausanne, Switzerland	SPIE, PO Box 10, Bellingham, WA 98227-0010, USA
October 4-6, 1990	1990 IEEE Workshop on Visual Languages	Skokie, Illinois, USA	Prof S K Chang, Department of Computer Science, University of Pittsburgh, PA 15260, USA
October 22-28, 1990	1st International Conference on Information Technologies for Image Analysis and Pattern Recognition	Lviv, USSR	Igor B Gurevitch, The Scientific Council "Cybernetics" of the USSR Academy of Sciences, Vavilov Street 40, Moscow 117967 GSP-1, USSR
October 22-26, 1990	International Conference on Signal Processing 1990	Beijing, China	Prof Yuan Baozong, Research Institute of Information Science, Northern Jiaotong University, Beijing 100044, China
October 29-31, 1990	Remote Sensing: An Operational Technology for the Mining and Petroleum Industries	London, UK	The Conference Office, The Institute of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, UK
November 6-9, 1990	International Symposium on the Intergration of photogrammetry and remote sensing into GIS: Use and Quality	Strasbourg, France	Alsace Congress, 20, rue du Jeu des Enfants, 67000 Strasbourg, France
November 28-30, 1990	IAPR Workshop on Machine Vision Applications	Tokyo, Japan	Prof Mikio Takagi, Institute of Industrial Science, University of Tokyo, 7- 22-1 Roppongi, Minatoku, Tokyo 106, Japan
December 3-7, 1990	IEEE 3rd International Conference on Computer Vision	Osaka, Japan	IEEE
December 26-27, 1990	7th Israeli Conference on Artificial Intelligence and Computer Vision	Tel-Aviv, Israel	Prof A Bruckstein, 7th AICV, Faculty of Computer Science, Technion, 32000 Haifa, Israel (freddy@techsel.bitnet)
Feb 24 - March 1, 1991	SPIE/SPSE Symposium on Electronic Imaging: Science and Technology	San Jose, California, USA	SPIE, PO Box 10, Bellingham, WA 98227-0010, USA
June 3-7, 1991	Vision Interface '91	Calgary, Alberta, Canada	Wayne A Davis, Department of Computing Science, University of Alberta, Edmonton, Alberta, Canada T6G 2H1