



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**

This issue of the *Newsletter* sees the official welcome of the Korean AI Society into the IAPR and a short introduction to the Society from its Chairman. Another highlight is an article, by Bernard Buxton, on the 1991 ESPRIT conference and exhibition; ESPRIT is the major source of funding for vision and pattern recognition research within Europe. It makes fascinating reading for both European researchers and interested observers.

*The Editor*

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Articles for inclusion in the *Newsletter* are always welcomed, and may be on any subject likely to be of interest to the IAPR community. They should be submitted, preferably electronically, directly to the editor at the above address.

## ECE'91: The ESPRIT Conference and Exhibition 1991

**T**HE ESPRIT CONFERENCE AND EXHIBITION, held annually at the Palais des Congrès in Brussels towards the end of November, covers the results and achievements of the whole ESPRIT information technology programme. Machine vision thus forms only a small part of the activities at the conference but there are three reasons why, as a vision researcher, it is nevertheless of interest to report briefly on my two and a half day flying visit.

First, the scale of the ESPRIT programme is so large that over twenty major projects involving the development of machine vision systems and techniques or their application have now been funded in the Information Processing Systems, Computer Integrated Manufacturing and Basic Research areas. In addition, a small number of image coding, compression and database projects have been supported in the Advanced Business and Home Systems area to complete the wide variety of vision and image processing projects in the ESPRIT portfolio. Work supported by the CIM and Advanced Business and Home Systems areas has always been strongly applications oriented whilst the IPS area has catered for more fundamental research on vision systems and architectures.

Second, ten of these projects were represented at the exhibition with stands featuring new hardware (P940, DMA), vision systems for the control of robot vehicles (P2502, VOILA), vision incorporated in a surveillance system (P1560, SKIDS), a vision development environment for industrial applications (P2592, VIDIMUS), vision for the control of a robot manipulator (P5227, CIM-SEARCH), and vision systems for inspection in robot manufacturing (P2091, VIMP), finishing (P2640, ICI) and assembly (P2017, TRIOS).

Finally, there was the Information Technology Forum on Thursday 28<sup>th</sup> November. This usually features a more political debate about the ESPRIT programme's achievements and future perspectives. This year, the theme of the Forum was information technology in the working environment but the session was obviously going to be lively in view of the perceived crisis in the information technology industry [1] and recent criticism of the effectiveness of the ESPRIT programme. In addition, it was particularly interesting for me, as a vision researcher, to have an opportunity to assess the direction of future activity as fundamental research work on vision techniques, systems and architectures no longer appeared in this autumn's 1991 workprogramme and vision work was already dispersed amongst a number of applications projects in the IPS and other areas.

**Vision and its Advanced Architectures** There were four talks in this specialist session on Tuesday 26<sup>th</sup> November. Three of them, by Thomas Skordas (iTMI), Eric Theron (MS2i) and myself (GEC-Marconi) presented work on the DMA, SKIDS and VOILA projects (Theron's talk on advanced architectures actually spanned all of these projects). In the fourth, Patrick Stelmaszyk (again iTMI) described vision research activity in Japan. Patrick's talk was in many ways similar to the one delivered at the British Machine Vision Association meeting on the development of vision systems for robot vehicles held in May 1991 at the GEC-Marconi Hirst Research Centre, but more specifically addressed the conduct of vision research in Japan. Three important aspects of the organisation of vision research in Japan emerged from this talk: one that industrial applications used (as to be expected) the most simplistic vision techniques, two that advanced research was being carried out in the laboratories of leading large Japanese companies, and three that the Japanese Vision Club plays a crucial role in co-ordinating research activity between the universities and industry. The Club, run by three leading university figures with a restricted industrial membership, seems to owe its success to the sharing of detailed information, not only of members' successes, but also of systems that have failed and the lessons to be learnt from them.

**The Exhibition** According to M. Carpentier, the Director General of CEC-DG XIII (which runs the ESPRIT programme), this year's Conference and Exhibition were the largest ever, with over 2000 people attending the conference and 125 projects exhibiting (25% more than in 1990). In addition, the exhibits were generally of a larger scale and higher quality than in the past and this was also true of the vision systems on display. Thus, four of the five vision projects supported by the Information Processing Systems division (DMA, SKIDS, VIDIMUS and VOILA) all had live exhibits whereas in 1990 only VOILA mounted a live exhibit. Similarly, the vision applications in the CIM exhibits were also live.

All four of the above IPS vision exhibits could be highlighted: DMA for the new hardware (FIR filter, NMS, linker, polygonal approximation and stereo fusion special purpose and DSP boards); VOILA for the Genoa DIST robot acting as watchdog over its exhibit and wandering around people's feet; SKIDS for its monitoring of the movement of people around the exhibit; and VIDIMUS for its graphical programming interface which is similar to, but I was told offers more flexibility than, the KHOROS system from the USA. In the CIM area, a vision system was controlling a robot "bar-tender" in pouring drinks. Unfortunately, it would have required a combination of this and the SKIDS exhibit to offer the refreshment service required in the rather overheated underground exhibition area. Other CIM exhibits featured high

precision, optical calibration systems for robot arms (*e.g.*, for inserting windows in car doors) and a customised VLSI chip (OPTIC) combining image segmentation, alignment correction and filtering capabilities for real-time object recognition.

**The IT Forum** The IT Forum on Thursday 28<sup>th</sup> November, opened with presentations by M. Carpentier (Director General, CEC-DG XIII) and F. M. Pandolfi (Vice-President, Commission of the European Communities) both of whom emphasised the difficulties currently facing the European electronics and IT industry. However, both were very "bullish" about the success of ESPRIT and the need for an expanded future programme with an overall target of 6% (equivalent to 5.4 billion ECU) of the European Community's financial resources for all R & D activities. Current programmes consume 3.5% of the EC's resources with ESPRIT taking 37% of this *for an industry that, by the year 2000, is predicted to be the largest industrial sector in Europe, with an annual turnover of 300 billion ECU, almost three times that of the automobile industry* [1]. However, Pandolfi stressed that future programmes must be carefully targeted to meeting the objectives on which the IT industry depends, both on the supply (technology) and demand side. In particular, he emphasised the need for an indigenous European semiconductor industry linked to the needs of other key technologies and for large-scale targeted projects in microelectronics, software, CIM, display technology and high performance computing.

These opening remarks on IT R & D policy were followed by several talks on the themes of IT and the citizen, IT and its users, and IT and the future, together with highlight presentations on CD-I technology, CIM and advanced UV lithography. These talks touched upon such diverse matters as the integration of information technology in the aerospace industry, IT and the law, and the importance of meeting users' needs. However, here I shall only briefly mention the talk by S. Purvis, Editor-in-Chief of ITN, and the CD-I presentation.

Purvis described how ITN's news gathering had been almost completely transformed by the introduction of computer technology from the use of an old iron spike for filing incoming news items when he began his career to present systems that could electronically trace and recall news items and the decisions taken about them days later. In fact, he stressed that *the systems were only really constrained by the imagination and limitation of the suppliers* (note that ITN own one of the largest suppliers, BASIS in California). Thus there are still many outstanding requirements for easy access and (screen touch) editing of picture sequences that must offer many opportunities for vision and image processing systems developers.

Finally, the highlight of the whole event was undoubtedly the Philips CD-I technology presentation, memorable for the

rather dry delivery of G. Bastiaens, Director of Philips Consumer Electronics, who led the presentation from the podium, and the stark contrast with his colleague who, with unstoppable enthusiasm, put the technology through its paces from the floor of the chamber. Important points in addition to the technology itself, which uses full motion video (MPEG) coding, were that the market was predicted to be 12 billion ECUs by 1995 and that Philips had made agreements with many Japanese companies and major publishing houses in order to try to avoid a "standards war", as occurred when video tapes were first introduced to the home market.

**Other Activities** In addition to the above, there are four other points I would like to mention.

First, the CEC is very concerned with promoting measures to finance innovation and held two specialist workshop sessions on this subject on Wednesday 27<sup>th</sup> November. Although I was able to attend only part of one of these, it is evident that the CEC has a variety of schemes such as VALUE, SPRINT, EUROTECH CAPITAL and the European Investment Bank, to try to facilitate the successful commercialisation of new ideas. However, what is not so clear is that these schemes actually address the key problems and significantly reduce the barriers to exploitation.

Second, five lines of action were proposed for the continuing support of the IT and electronics industries:

- stimulation of demand,
- training and networks of excellence, including both academe and industry,
- ensuring an open international trading system (referred to as "a level playing field with fair rules of the game"),
- providing a healthy business environment through improved financing systems, infrastructure for co-operation and standardisation,
- fostering a second generation of fundamental (basic) research.

Implementation of this strategy has already begun in the 1991 workprogramme, which included a new "open microprocessor systems initiative" aimed at providing a complete microprocessor systems environment, including microprocessors, design tools and the software required to integrate advanced products for many market sectors. A good discussion of the background to the OMI is contained in a paper in the Conference Proceedings [2] which includes much information on market trends and requirements. Vision is one of the applications areas identified in the OMI workprogramme and obviously has much to gain from the availability of cheap, powerful and flexible microprocessors.

In addition, it is also notable that standardization is rapidly becoming an issue in the development of machine vision and image processing software, hardware and systems. An ISO standardization activity commenced some time ago whilst there is an ESPRIT project, P5225 ARVISA, aimed at producing a "de facto" European standard and development environment for medium to high performance vision systems. The CEC is also itself trying to launch an image database for data exchange and standardization of the performance of image processing and machine vision algorithms.

Finally, it is notable that the final Friday of the meeting was devoted to specialized tutorials. Speech and neural networks both feature prominently amongst these but there were no tutorials on machine vision and image processing, a gap that seems rather alarming.

**Conclusion** The obvious general conclusions to be drawn from this year's conference are the general acceptance of the importance of the IT and electronics industry and the pressure that (some) politicians and Eurocrats are mounting for measures to support and encourage it particularly on the supply side. In so doing, the plan is to pay greater attention to users' requirements in defining viable target market areas and to target key technologies and applications. Alternatively, as speakers in the IT forum put it, Europe should:

- (a) follow President Kennedy's example in announcing that the USA would "put a man on the moon by the end of the decade" rather than asking von Braun to build more powerful rockets, and
- (b) learn a five-hundred-year-old lesson from Columbus who also had a project of strategic importance to Europe that almost failed through lack of financial support.

On an equally positive note, there has been a considerable amount of machine vision activity within the current phases of ESPRIT which is producing a number of promising technological results. It is thus perhaps not unsurprising that the emphasis in the 1991 call shifted fairly heavily towards applications.

Finally, on a personal note, as manager of the VOILA project I was greatly pleased by the success of our exhibit and thank my French and Italian colleagues whose turn it was to shoulder the burden of mounting the exhibit this year. In addition, I note that VOILA was the only vision project to have a live demonstration in the exhibit, to be presented in one of the conference sessions, and to have a paper in the proceedings [3].

**References** [1] "ESPRIT, Progress and Results 1990/91, Introduction," by J-M Cadiou, Director, ESPRIT, pp 7-14.

[2] "OMI, Open Microprocessor system Initiative," and the "Microprocessor Architecture Project," ESPRIT'91, Proceedings of the Annual Esprit Conference, Brussels, 25-29 November 1991, pp 54-79.

[3] B F Buxton *et al*, "The transfer of vision research to vehicle systems and demonstrations," ESPRIT'91, Proceedings of the Annual Esprit Conference, Brussels, 25-29 November 1991 pp 322-335.

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## Retirement of Prof. Dutta Majumdar

PROF. D. DUTTA MAJUMDAR, Chairman of the IUPRAI and member of the IAPR Governing Board for India completed his 60 years in February 1992. The IUPRAI in collaboration with Indian Statistical Institute is organising a series of lectures to felicitate him on this occasion. Prof. J. M. Brady (Oxford University), Prof. T. Binford (Stanford University), Prof. O. Faugeras (INRIA, France) and many others are amongst the list of invited speakers. It is contemplated that some edited volumes will be brought out in due course. The series commenced with the *Workshop on High Performance Computing* on 24-25<sup>th</sup> October 1991, organised jointly by National Centre for Knowledge Based Computing (NCKBC) and Centre for Development of Advanced Computing (C-DAC). An International Workshop on Recent Trends in Speech, Music and Allied Signal Processing was held at Delhi on 9-11<sup>th</sup> December 1991. Prof. Morris Hartmann (Michigan State University), Prof. C. Guerra (Univ of Roma), and Prof. L. Boves (University of Nijmegen) were among the invited speakers.

Ashoke K. Datta  
IUPRAI Treasurer

## New E-Mail Address for IAPR Secretary

Dr. Gunilla Borgefors, the IAPR secretary, has a new e-mail address. She can now be reached as [gunilla@lin.foa.se](mailto:gunilla@lin.foa.se).

## Korea Joins the IAPR

**T**HE IAPR HAS A NEW MEMBER SOCIETY. A large majority of the governing board (thanks for the quick response from most of you) voted to admit the Korean Artificial Intelligence group (K-SIGAI) from South Korea into the society. Nobody voted against them. The K-SIGAI is a category B member, with an effective membership of 500 persons. Thus, they are a significant addition to the IAPR. The two Korean Governing Board members are Prof. Hyun Seung Yang from Korea Advanced Institute of Science and Technology and Prof. Chung Nim Lee from the Pohang Institute of Science and Technology. The address *etc.* to contact our new member is:

### Prof. Hyun Seung Yang

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Welcome into the IAPR!

*Gunilla Borgefors*  
IAPR Secretary

## A Message from Korea

**T**HE KOREAN ARTIFICIAL INTELLIGENCE group of KISS (Korean Information Science Society) has been recently elected as the national member of IAPR for Korea.

Our group consists of about 600 members from academia and industry. The major research activities of our group include Artificial Intelligence, Pattern Recognition, Computer Vision, Neural Networks, Intelligent Robotics, *etc.*. About one-half of our members are currently working on research related to pattern recognition, computer vision, and image processing. We host domestic conferences on AI twice every year, where half of the presentations deal with topics related to pattern recognition and computer vision. We also sponsor the Korean Image Processing and Understanding Workshop every year which is the most important convention on computer vision, image processing and pattern recognition in Korea. In 1991, we sponsored the First Korea-Japan Joint Conference on Computer Vision, which was held in Seoul, Korea. This year (1992), we are playing a central rôle in hosting the 2<sup>nd</sup> Pacific Rim International Conference on Artificial Intelligence, also to be held in Seoul. In this conference, pattern recognition and computer vision will be included as major topics together with other AI-related ones. In 1993, we will participate in the Asian Conference on Computer Vision '93 as the Korean Representative.

If anyone would like more specific information on our group than the above, please let me know.

*YANG, Hyun Seung*  
Chairman of the Korean AI Group

## Book Review

*Computational Vision* by Harry Wechsler, Academic Press, ISBN 0-12-741245-X.

"The vision systems of the future may have as much resemblance to the human vision system as aeroplanes have to birds!" I am sure I read this somewhere but I don't remember where and thus I apologize to the person who first made this comment for not crediting him/her properly!

Harry Wechsler's book on Computational Vision touches exactly upon this point: Human and computer vision systems both compute, but not necessarily in the same way or the same things; thus the title Computational Vision was chosen because the emphasis of the book is on how vision might work and be implemented. This theme is pervasive throughout the book: Everything is soundly based on its Mathematical foundations. At the same time, the physiological and psychological evidence is mentioned, compared and contrasted with theory. Much emphasis is placed on parallel and multi-resolution approaches and nothing is left hanging in the air, as special effort has been put in making the book self-contained and in the presentation of the various approaches throughout. There are no heuristics or hand-waving arguments; no short-cuts and papering over the cracks; instead, the vision problems are tackled as they should be: with the proper tools of the scientist: Mathematics!

Three out of the ten chapters of the book, a number which includes an introduction to the computational theory and an epilogue, are devoted exclusively to distributed processes, including their hardware implementation. The remaining five chapters are devoted to the concepts of invariance and intrinsic representation, to active perception, object recognition and to intelligent systems with the PDP approach almost omnipresent.

I am sure this book is going to be a classic for several years to come, until of course it is out-dated by new research developments. It certainly fills a gap in the market and I would not hesitate to recommend it to anybody as a graduate text and research reference.

*Maria Petrou*  
University of Surrey, UK

## Shape in Picture: The Mathematical Description of Shape in Greylevel Images

*Driebergen, the Netherlands*

7-11 September 1992

This is a NATO Advanced Research Workshop that will focus on the construction of shape descriptions in greylevel images that involve the use of advanced and theoretically well founded mathematical methods. The workshop will feature sessions for presentation of papers, posters, work in progress, and discussions. On demand, panels devoted to selected topics will be organised to allow exhaustive discussion. The emphasis is on the exchange of results and ideas amongst scientists of various fields who are actively involved in the development of mathematical description of shape in greylevel images. Shape description can be regarded as a meeting point of vision research, mathematics, computing science, and various application fields of image analysis, computer vision, and artificial intelligence. Proceedings of the workshop will be published according to NATO ARW regulations. The proceedings will include contributions, (edited) discussions, and perhaps conclusions resulting from the workshop.

### Programme Content

**Theory of Shape** Theory of Shape Perception; Categorical Shape Theory

**Hierarchical Shape Representation** Evolutionary Representation; Multilevel Representation

**Local Shape Extraction** Mathematical Morphology; Wavelets; Differential Geometry; Computational Geometry

**Symbolic Description of Shape** Shape Primitives; Graph Representation; Topological Representation; Description Language

## Ninth Israeli Conference on AI and Computer Vision

*Tel-Aviv, Israel*

28-29 December, 1992

Send 4 copies of full paper by 15<sup>th</sup> June 1992 to:

**Shimon Edelman**

9<sup>th</sup> IAICV

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## Astronomy From Large Databases II

*Haguenu, near Strasbourg, France*

14-16 September 1992

### Topics

- Presentation of astrophysical results from diverse databases and archives
- Application of artificial intelligence to quality control and maintenance of data in databases and archives
- Intelligent information retrieval
- Scientific visualization and interactive analysis systems
- Integration of bibliographic, textual and numeric data collections; integration with directory services; tools such as proposal and publication aids, thesauri and acronym lists.
- Methods for interpreting data: statistics, knowledge-based systems, and image processing; browsing and quick-look tools; summarization and report generation capabilities.
- The future: what environments can best serve astronomical research?

The emphasis is on the astronomy coming out of the available and future databases and archives, as well as on the range of related methodologies. The Proceedings will be published by the European Southern Observatory, Garching/Munich. The conference is supported by IAPR Technical Committee 13, as well as by a number of other organisations.

The conference venue will be the historical *Koifhus* (15<sup>th</sup> -16<sup>th</sup> centuries) in Colmar, in the heart of the picturesque Alsatian wine-growing region.

Abstracts (one page) should be submitted before 31<sup>st</sup> May 1992. Camera-ready copy of accepted contributions, together with a machine-readable version, are expected at the meeting. Format instructions will be forwarded later.

For further information and addresses for abstract submissions, contact:

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**Deadlines**

15<sup>th</sup> May 1992 Abstract (1000 words, 4 copies)  
1<sup>st</sup> Jul 1992 Closing date for submissions  
7<sup>th</sup> Sep 1992 Camera-ready manuscript

For more information and submission of abstracts, contact:

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## **IAPR TC7 Workshop on Multisource Data Integration in Remote Sensing**

*Wageningen, The Netherlands  
7-9 September 1992*

This meeting follows on from the ICPR Satellite Congress early September in The Hague, The Netherlands.

**Programme** This workshop is organised under the auspices of the International Association for Pattern Recognition's Technical Committee 7 (Applications in Remote Sensing) is organised by the Wageningen Agricultural University, Department of Surveying and Remote Sensing, and co-sponsored by IAPR. The Chairmen are Prof. Dr. Ir. M. Moleenaar (WAU) and Prof. Ir. N.J. Mulder (ITC). The workshop's topic is multisource data integration with respect to land inventory applications. An important aim of the workshop is to have sufficient possibilities for discussion. Hence, only 18 persons can contribute a paper and a maximum of 30 persons can attend the workshop. In plenary sessions authors have 30 minutes to represent their paper.

Original and unpublished contributions are invited in the fields of

- image processing
- integration of remote sensing data and geo-information
- synergetic use of remote sensing data;
- inference methods and concepts of object representation

## Forthcoming Conferences, Workshops and Events

Please notify the editor of any additions to this list.

DATE	EVENT	LOCATION	CONTACT ADDRESS [SPONSOR]
18-23 May 1992	Second European Conference on Computer Vision	Ligure, Italy	Piera Ponta, ECCV'92 Secretariat, Consorzio Genova Recherche, Via dell Accicio 139, 16152 Genova, Italy
26-27 Jun 1992	Second Symposium on Digital Imaging in Dental Radiology	Amsterdam, The Netherlands	Paul F. van der Stelt DDS PhD, Academic Centre for Dentistry Amsterdam, Louwesweg 1, 1066 EA Amsterdam, The Netherlands
7-10 Jul 1992	1992 IEEE Conference on Intelligent Robots and Systems	Raleigh, North Carolina, USA	Avi Kak, School of Electrical Engineering, Purdue University, West Lafayette, IN 47907, USA (kak@ecn.purdue.edu)
3-7 Aug 1992	10 <sup>th</sup> European Conference on Artificial Intelligence	Vienna, Austria	Bernd Neumann, FB Informatik, University of Hamburg
24-27 Aug 1992	Third International Conference on Visual Search	Nottingham, UK	TICVS, Academic Radiology, University Hospital, Queens Medical Centre, Clifton Boulevard, Nottingham, NG7 2UH, UK [AVA]
29 Aug 1992	Workshop on Contextual Methods in Pattern Recognition	The Hague, The Netherlands	Torfinn Taxt, Aarstadveien 19, University of Bergen, 5000 Bergen, Norway [IAPR]
30 Aug-3 Sep 1992	11 <sup>th</sup> International Conference on Pattern Recognition	The Hague, The Netherlands	11 <sup>th</sup> ICPR Secretariat, Delft University of Technology, P. O. Box 5031, 2600 GA Delft, The Netherlands (icpr@et.tudelft.nl) [IAPR]
30 Aug-3 Sep 1992	Pisa, Italy	European Conference on Visual Perception	David Burr and Concetta Morrone, Istituto di Neurofisiologia del CNR, Via S. Zeno 51, Pisa, Italy
7-9 Sep 1992	IAPR TC7 Workshop on Multi-Source Data Integration in Remote Sensing	Wagenigen, The Netherlands	Anke Hoeneveld, WAU, Dept. of Surveying and Remote Sensing, P. O. Box 339, NL-6700 AH Wagenigen, The Netherlands [IAPR]
15-18 Sep 1992	Second International Conference on Automation, Robotics, and Computer Vision	Singapore	ICARCV'92 Secretariat, Associated Conventions and Exhibitions Pte Ltd, Singapore (emital@ntivax.bitnet)
21-24 Sep 1992	British Machine Vision Conference	Leeds, UK	Prof. David Hogg, School of Computer Studies, University of Leeds, Leeds LS2 9JT, UK (dch@dcs.leeds.ac.uk) [BMVA]
7-9 Dec 1992	IAPR Workshop on Machine Vision Applications	Tokyo, Japan	Prof. Mikio Takagi, Institute of Industrial Science, University of Tokyo, 7-22-1 Roppongi, Minato-ku, Tokyo 106, Japan
21-23 Dec 1992	Second International Conference on Parallel Image Analysis	Ube, Japan	Prof. Katsushi Inoue, Dept. Computer Science and Systems Engineering, Yamaguchi University, Ube 755, Japan
28-29 Dec 1992	9 <sup>th</sup> Israeli Conference on AI and Computer Vision	Tel-Aviv, Israel	Shimon Edelman, 9 <sup>th</sup> IAICV, Dept. of Computer Science, The Weizmann Institute of Science, 76100 Rehovot, ISRAEL