



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

THE IAPR EXECUTIVE COMMITTEE and the Printing and Publications Committee have recently been looking at ways of ensuring faster delivery of the *Newsletter* to its readers. In the past, distribution has always been by bulk mailing to each member country, then local distribution by the member society. This has often proved to be too slow, even using air freight. Starting from the next issue, the printing of most copies of the *Newsletter* will switch from the United Kingdom to Czechoslovakia, and it will be mailed out directly to most recipients. This means that the information will get from my word processor into your hands much more quickly than it does at present.

The Editor

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.

Circulation: 14,900 copies

IAPR Executive Committee meeting

THE IAPR EXECUTIVE COMMITTEE (ExCo) held a meeting in the afternoon of 30th January 1992 at Ecole Polytechnique Fedrale de Lausanne, Lausanne, Switzerland. Present were Prof. M. J. B. Duff (President), Prof. S. Levialdi (First Vice-President), Dr. M. Ejiri (Second Vice-President), Dr. G. Borgefors (Secretary), and Prof. J. Kittler (Publications and Publicity Chairman). Present for part of the meeting by telephone was Prof. J. K. Aggarwal (Treasurer). What follows below is abbreviated version of the minutes, so that all of you can get an idea of what is going on.

The President opened the meeting and welcomed all participants. The Treasurer's report showed that the IAPR economy is satisfactory. Everything suggested by the ExCo has been supported. The Treasurer expressed some doubts on whether the attendance at the 11th ICPR will be satisfactory, especially from the USA. The Secretary replied that 799 abstracts had been sent in, which is more than the total 10th ICPR attendance. About 250 abstracts were sent to each of the tracks, with the exception of the architecture one with only 50 abstracts. At most 605 will be accepted, either as oral presentations or posters. Prof. Kittler added that, in his conference track (pattern recognition), 20–25% of the contributions were from the USA. The President asked how much revenue the IAPR will lose because of the exclusion of the food from the sum of conference fees, from which the IAPR percentage is computed. The Treasurer said that the total can be halved, as food is a major source of revenue.

Prof. Levialdi (chairman of the conferences and meetings committee) had a list of conferences that have applied for IAPR sponsorship. All applications were unanimously approved. There have apparently been some communication problems with Prof. Levialdi: the ExCo will try to remedy these.

The next item on the agenda was the IAPR presence at the 11th ICPR in The Hague. It was again stressed that the 11th ICPR must be seen as an IAPR event, in contrast to the 10th ICPR which became an IEEE event. One way to counteract this is to have an IAPR stall, with information about the IAPR on display. The president asked the ExCo members to think about displays in their respective areas of influence, including information on how to become an IAPR member.

Four meetings will be held in the Hague, in the following order:

- Meeting of the TC chairmen
- Meeting of the ExCo
- Meeting of the Governing Board (GB)
- Meeting of the new ExCo

The Secretary will make the arrangements for the necessary meetings with the local arrangements chairman, Dr. Ger-

brands. The deadline for proposals for the GB meeting is 1st May. An invitation will be sent out in March.

Prof. Kittler has given thought to reprinting the IAPR brochure. The old brochure cannot be reprinted at present, as the information in it will quickly become dated. The IAPR therefore needs a permanent "office". A small company, "Membership Services", in the U.K. has made a proposal for the IAPR to provide this service. This will, of course, cost some money. The ExCo will take a decision on Membership Services' proposal in the near future.

The President has polled the ExCo regarding the venue of the 12th ICPR, as was agreed at the last ExCo meeting. The ExCo saw no reason the change the decision made in Atlantic City, namely that it should be held in Jerusalem, Israel. The President has told the 12th ICPR organizers of this decision. He pointed out that, as the USA attendance will probably be rather low, we should not expect very much money from this ICPR. The ExCo already has a preliminary programme for the 12th ICPR; the only problem with it is that explicit mention of applications was missing. The organizers have been told about this and have promised to amend the programme accordingly.

General concern was expressed over the way the reviewing process for the 11th ICPR has been conducted. It was generally considered too weak because, among other things, only abstracts were submitted. Prof. Kittler suggested that guidelines should be written to avoid future problems. The Secretary pointed out that it should always be possible for the authors to get reviewers' comments. This has been the case for some ICPRs, though not for all. Prof. Levialdi and Dr. Peleg were asked to prepare a proposal for guidelines on how to organize an ICPR (including the review process) for the next GB meeting.

A report had been prepared by the chairman of the membership committee (*i.e.*, by this author). The three most hopeful prospective members are Hong Kong, Poland, and Taiwan. The president also raised the question of whether the IAPR should offer grants for setting up new member societies. This was generally viewed positively, so the President will follow up on this idea.

There are several rather inactive member societies, and a number of societies that have difficulties paying their dues. The IAPR needs a policy on how to handle this. The biggest problem at present is the Commonwealth of Independent States (the former USSR). They have been in contact, saying that they will try to keep the society together. The West German society also seems to have problems, specifically with distribution of the *Newsletter*. In view of these difficulties, it was agreed that no pressure should be put on the East Germany society to merge with it. There are one or two other societies in different types of difficulties. The Secretary proposed that a 'sleeping' membership should be created, for so-

cieties experiencing temporary difficulties. This would mean no voting rights and no bulk mailing of the *Newsletter*; however, all IAPR information, including the *Newsletter*, would be sent to the GB members and a few other key persons. The society would be reinstated to full membership as soon as they start functioning properly. The ExCo supported this idea of associate membership and the Secretary was asked to write a proposal for the GB meeting.

Prof. Kittler has investigated the possibilities and costs for individual mailing of the *Newsletter* to all members. He has been in contact with printers in Czechoslovakia, who are prepared to print and mail the *Newsletter* at a reasonable cost.

The difficulties of the distribution of the *Newsletter* in the USA and also of definition the US membership were discussed. The *Newsletter* is currently distributed twice a year to the PAMI technical committee (about 1,100 persons); when PAMI was rich, the IAPR *Newsletter* was distributed to all 11,000 PAMI society members. The Treasurer thought individual mailing would be both difficult and expensive. It is also not clear who should be on the mailing list. The whole PAMI society is too big, and also many members of it would not be interested in the *Newsletter*. The PAMI Technical committee address list is not in order and needs to be brought up to date. He also pointed out that the question of who in the USA is an IAPR member is not a good one, and that such a discussion is not fruitful, as the issue is not possible to resolve, especially now when IEEE is going through a difficult time. The President pointed out that the goal must be to get the *Newsletter* to everybody in the PAMI society that is interested, and to get it to them in time. It was pointed out that distribution by e-mail was probably not a possibility, as that had been tried without success for the PAMI *Newsletter*. Prof. Kittler said that the extra cost for IAPR for individual mailing to the PAMI-TC would be \$3,400. When the President suggested that people could be asked to respond as to whether they wanted the *Newsletter* or not, the Treasurer thought that very few would respond.

The President then asked why there are four US governing board members and the Treasurer replied that this was an old decision. He said that of the 11,000 PAMI society members, probably about 1,200 are interested in the IAPR, but that it is impossible to distinguish them. Prof. Levaldi pointed out that the ACM interest group is another body in the USA that should be interested in the IAPR. The Treasurer promised to contact the ACM interest group and commented that this is true, but that IEEE cannot do anything about it. In conclusion to the discussion regarding USA membership, the President said that, as Prof. Kak (presently the president of PAMI-TC), is willing to discuss the problems with us, these discussions should continue.

Dr. Ejiri pointed out that in Japan the problem of membership is similar to the one in the USA. It was concluded

that individual mailing might eventually help. A *Newsletter* mailing list does exist. In fact, individual mailing could improve the situation in several countries that today are in various types of difficulties, to promote a feeling of a community. The President made the recommendation that individual mailing should be offered to every member but USA and Japan. Each society must prepare their own mailing lists, and send it on a floppy disc to the printers. Updating the address list will also be the responsibility of the member societies, who should send in new floppies as often as they deem necessary. This should be made clear in the offer, together with acceptable formats for the disc. Dr. Kittler was asked to prepare the offer. He was furthermore authorized to negotiate and sign the contract with the printers.

The possibility of raising the dues for national members was discussed. (Individual mailing should lower their costs, as they will no longer have to mail out the *Newsletter* locally.) Also, the amount per member is very different for the different member categories. Prof. Levaldi proposed that the membership due should be based on actual membership and be e.g. \$2 per member. The President concluded that this issue should be looked into carefully.

Dr. Ejiri had prepared a written report on relations with the industry and on establishing IAPR fellowships. To make the fellowship procedure manageable a simple 'point system' was suggested. Dr. Ejiri thought that an IAPR fellowship would be very good for a person in industry, and would be regarded with respect by his employers. All agreed that the procedure for getting an IAPR fellowship should be reasonably simple. The President will ask the Awards committee to look into the fellowship proposal. It was also agreed that Dr. Ejiri should write letters according to a number of industrially-related actions in his report.

The President informed the meeting that *Pattern Recognition Letters* will include an IAPR discussion section, as proposed at the previous ExCo meeting. Professors Haralick, Pavlidis, and Rosenfeld have or have promised to write debate articles. The first has already appeared.

Prof. Levaldi raised the question of whether it would be a good idea for the IAPR to have a list of courses, tutorials, video-cassettes etc., sponsored by the IAPR. The meeting thought this was a good idea, and that a new committee should be set up for this purpose. The minimal ambition should be a list of tutorials and speakers, and that the existence of this list should be advertised. The President will therefore create a Education Committee.

As you can see, a fair number of questions were debated at the meeting, and there will be a number of proposals for the Governing Board meeting in The Hague to vote on.

Gunilla Borgefors
Secretary

DICTA-91 Digital Image Computing: Techniques and Applications

AFTER SOME TEN MONTHS of solid work by APRS committee members, it was a relief when DICTA-91, the first biennial conference of the Australian Pattern Recognition Society, finally took place at the Royal Exhibition Buildings, Melbourne on 4-6 December 1991. A surprising number of unexpected late registrations were received and the eventual number of delegates attending was around 180. They came from most states and several overseas countries: New Zealand, Singapore, UK, and USA. Four invited speakers provided informative talks on their specialist areas: Chris Bowman from DSIR in Auckland (Image Analysis Research in DSIR), Terry Caelli from Melbourne University (Modelling and Analysing 3D Environments), Anil Jain from the University of Michigan (3D Object Recognition Systems) and Margaret Varga from Defence Research Agency in Malvern UK (Thermal Medical Imaging and Automated Reasoning).

Of the 100 or so papers submitted for refereeing, about 75 were accepted for presentation at the conference and published by APRS in a volume of proceedings (ISBN 0-646-07338-9). Blocks of single and parallel sessions were alternated through each day so that delegates had the opportunity to participate in the talks together, as well as pursuing particular interests in subject sessions. The subjects covered ranged from robotic vision and 3-D object recognition to image features and morphology: the conference actively lived up to its promise to cover both theoretical techniques and practical applications.

A modest trade exhibition was held in conjunction with the conference, displaying workstations, software, and ranging and digitizing equipment. The AGM of the APRS was held after the sessions finished on the middle day, and was attended by around 50 persons. Prof. Jain gave a brief talk on the role of the International Association for Pattern Recognition (of which APRS is the member for Australia) and conducted elections for the 1992 APRS committee. Two social events were held, a "get-to-know-you" conference lunch on the first day and an evening reception sponsored by Sun Microsystems. Other sponsors included DEC, who contributed to the proceedings, and Silicon Graphics, who assisted with publicity material. The departments of Computer Science and Electrical Engineering at Monash, University of Melbourne, Victoria University of Technology and CSIRO Division of Mineral and Process Engineering provided in-kind help. The major conference sponsor was DITAC (Commonwealth Department of Industry, Technology and Commerce) which funded costs for the three overseas invited speakers with a grant of \$7,000. The eventual budget for the conference was over \$20,000, a real headache to manage!

The conference was successful in providing an opportunity

for workers in all areas of image processing and analysis in Australia to meet and find out what others around the nation are doing. It certainly established the worth of running such a meeting as many new contacts were made and old ones refreshed. It was especially pleasing to see a number of delegates from private companies, not just academics from universities and scientists from research organisations. There is probably not rapid enough change in Australia to justify a conference such as this more frequently than biennially, but APRS is planning a specialist workshop as its major national event for 1992 in Perth.

Anthony Maeder
President, APRS

The Conference on Architectures for Machine Perception 1991

THE CONFERENCE on Architectures for Machine Perception, CAMP91, was held at the Forest Hill Hotel, La Villette in Paris from the 16th to the 18th of December 1991. This was the fifth in a series, with two changes in name, indicative of the vitality in this domain. Since the first CAPAIDM, held in Hot Spring, Virginia in 1981, the meeting name shifted from *Pattern Analysis and Data Bases* to *Machine Intelligence* and then to *Machine Perception*, with more and more concern for integrated circuits. This is one reason why the present conference was organized in cooperation with the IEEE Circuits and Systems Society and the French AFCET. It was sponsored by both the French Education Ministry and the Defence Research Agency, together with the EEC-DGXIII of Esprit.

The meeting was once again fairly international, gathering almost 130 attendees: 70 from France, 35 from the rest of the Europe (Italy, Spain, Switzerland, Sweden, Belgium, Greece, Germany, England, Holland and Poland), 15 from the U.S. and Canada, and 10 from the Far East (Japan, Korea, Hong Kong). The standard was very high, with the oral presentation of 41 papers and 14 posters on display, selected from the 90 extended abstracts that were submitted.

Based on paper submissions, the main trends in the field appear to be:

- Integrated architectures, both vision and memorizing.
- VLSI based architectures, prompted by functional programming, algorithmics and topology.
- Parallel programming, with an emphasis on interfacing or prototyping by means of adapted languages or environments.

- Symbolic processing: architectures that deal with tree handling and data bases.
- Communication networks: from graph representation up to diffusion on reconfigurable devices.
- Heterogeneous machines: inspired by vision operators and by model implementation as well (such as CAD).
- SIMD machines: still simulation, algorithmics with a fair stress on multi-resolution, performance studies on fine-grain machines like pyramids or hypercubes.
- Mathematical morphology and, more generally, boolean operations which remain interesting by the simplicity of the atomic operations on both classical (bitmap) and ad-hoc (integrated) architectures.
- Optical computing: whether for matrix computation or neural networks, architectures are no longer restricted by interconnections.
- Architectures for robotics: obstacle avoidance, visual servoing, multisensoring. . . a flavour of control is becoming apparent.
- Dedicated systems: mainly industrial applications to give practical informations.
- Comparisons: evaluating algorithm performance on various machines.

The conference committee's attempt to extend the scope towards specialized architectures for decision control, sensor fusion or simulation, seems to have been somewhat premature.

On Monday evening (Monday was a very serious and long day), a buffet-bar panel discussion was moderated by S. Tanimoto: *AI vs Massive parallelism*. Steve first conducted the team of panelists, all professors, to emulate a SIMD pseudo-clever distributed machine of his own, in a screamingly funny manner.

On Wednesday evening, a general discussion about 'designing yet other specialised machines' was moderated by T. Van der Pyl from EEC-ESPRIT, to conclude the workshop. The debate was hot between supporters of assembling off-the-shelf components and those who prefer to do it all themselves. Nevertheless some agreement was reached on the following aspects:

- A vision machine is part of a larger system that must be kept under control.
- Parallelism does not solely help to speed processes, it allows comparisons of algorithmics to progress. Yet general-purpose parallel computers are too slow and expensive. self organization may hold.

- One reason why we need to keep building machines is to learn which machines need to be built, what performances one can expect, *etc.*.
- Computer science is now in an experimental phase which makes it closer to physics and biology than to mathematics. Such domains include experimental setups which, in turn, support the theoretical research. Another type of disagreement was between agency representatives and university: the former were generally in favour of granting projects most likely to give a quick industrial payoff.

CAMP 91 was a true success and the audience agreed to the steering committee's proposal to hold a CAMP 93, which M. Bayoumi and L. Davis have agreed to organize in Louisiana — and we have already started. For those unable to attend CAMP 91, 100 hard-bound proceeding copies (620 pages) are available.

A copy of the proceedings can be bought for the price of 400 F (or \$70) from:

Mrs Simeon

S.E.E., Societe des Electriciens et des Electroniciens
48, Rue de la Procession
F75724 PARIS CEDEX
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Tel: +33 1 44496000
Fax: +33 1 44496049

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SSAB 92: The Swedish Society for Automated Image Analysis Annual Symposium

S SAB 92 WAS HELD IN UPPSALA during March 11-12 this year. These annual symposia started in the early 1980s. As usual, this year was the biggest ever, with 71 presented papers and about 180 participants. The first day was devoted to theory and the second one to applications. The biggest application area in Sweden is, without question, medical imagery. There was also an industrial exhibition, with twelve companies represented. The industrial participation

was not as strong as we would like, but still much higher than in previous years. This is an encouraging trend.

The papers for the SSAB symposia are not reviewed and we do not insist on original contributions. Instead, we want to give a broad overview of everything that goes on in Sweden in the digital image analysis area each year. The symposium language is Swedish but, starting from last year, the proceedings are in English. The interesting 1992 proceedings have 290 pages (some in colour). We have a number of copies for sale: the price is \$30, including surface mail anywhere in the world. So, for those of you that want to know what goes on in Sweden, order the SSAB 92 proceedings, from

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Gunilla Borgefors
Past President of SSAB

The European Conference on Computer Vision

LET'S FACE IT: a lot of us choose the conferences we go to according to the venue; scientific merit, although not neglected, often comes second. What comes to mind when you think of Italy? Sunshine, blue seas, wonderful food...the *sole mio* stuff. Well, an ECCV conference in Santa Margherita sounded the perfect recipe. Sounded, but alas was not! Although the scientific aspect was good, the *sole mio* aspect let us down rather badly. As the conference chairperson, Giulio Sandini, put it in his welcome address, people go to Italy expecting that nothing works and the weather is perfect. This time, people's expectations were justified in the first count, but not in the second! Half of the proceedings were delivered on the penultimate day of the conference. Half of the projection screen was not visible by half of the audience. Half of the microphones kept breaking down half of the time and half of the time it was drizzling while the other half the wind was blowing. But the complete disaster was the banquet: this was held in a villa and cost the handsome amount of 100,000 liras. The participants were spread through three different rooms; only half of the people were in the same room as the committee, where all the fun was and all the announcements were made. Being an unlucky one who was stuck in a side-chamber, I can only report that I heard on the grapevine that the prize for the best paper went to Lee and Bajcsy for their work on specularities

and that the second prize went to Cipolla and Blake for their work on motion — and that ECCV94 will be in Stockholm. But I wouldn't swear to that since, as I said, I heard it only on the grapevine. As for the culinary experience, don't ask! The English roast beef of the menu turned out to be a slice of cold beef with the texture of ground and the taste of soil; the mushrooms, asparagus and the artichokes were disguised as a puff of thinly cut lettuce and the after-dinner Ballandine and local liqueurs were somehow miraculously turned into sparkling wine!

And now to the less important aspect of the conference, the scientific content. I must say that this was very high. With the exception of a handful of papers which somehow slipped through the system, the great majority of papers were of high quality. However, it was interesting to see that, in some cases, the wheel is being re-discovered — only that the first time round it was called Pattern Recognition and this time it is called Vision! In any case, time goes on and if you want to be 'in' now, make sure you use the new buzzwords: colour, saliency, uncalibrated camera, invariance, scale (any scale, multiscale, scale-independent, scale-invariant, *etc.*). Curvature filters and junction filters are 'in'; edge detection is 'out'; neurophysiological evidence is 'in'; neural nets are 'out'. (In fact, that particular term was only heard twice in the whole conference!) Another interesting feature was the reference by several authors to transparent objects. Actually, there was a whole paper devoted entirely to the problem of transparent objects, from the theoretical point of view, given by Shizawa. Maybe transparency will be the buzzword of the next ECCV.

There was a strong American presence in the conference: out of the 105 papers, 36 were from North America, 60 from Europe, and 9 from the rest of the world (Japan, Israel and Australia). This establishes the conference as one of the major international conferences on Vision.

There were lots of entertaining moments in the sessions, but one of the major highlights was when Ruzena Bajcsy, a very strict session chairperson herself, overran her presentation time by 10 minutes. After several warnings from the session chairpersons, she was told that they were going to take her off the stage! Ruzena, undeterred, carried on because she absolutely felt she ought to tell us that, in spite of the fact that we did not know it, our porsche appeals to us more if its highlights are in a certain position. And when we applauded thinking that that was the end, Ruzena started on her conclusions!

Such was the fear of the chairpersons (there were two of them in each session to make sure that if one was too lenient the other was not) that Sparr started his presentation with his conclusions to make sure he had time to go through them! He also suggested to the audience the question he wanted to be asked — and, in case you wonder, somebody from the

audience duly obliged him! Margaret Fleck showed the map of USA in order to point out for the sake of the Californians in the audience where Iowa is. But I think the most unfortunate of all speakers was Funt: the small microphone was making noises at the back of the room and the large microphone was bang-bang-banging every time he tried to say a word. The slide projector kept showing blanks and the lights kept coming on and going off at the wrong moments! In spite of all that he did give an interesting talk on shape from shading. We also had with us Culhane who apologized in advance for any mistakes in his talk because he had been married only 4 days earlier. I do not think there was anything in his talk to apologize for. And, with that happy note, I will end my report.

Maria Petrou
University of Surrey, UK

A CD-ROM of Handwritten Addresses

THE CENTRE of Excellence for Document Analysis and Recognition (CEDAR) of the State University of New York at Buffalo is pleased to announce the availability of a CD-ROM database that contains handwritten words and ZIP Codes in high resolution greyscale (300 ppi, 8-bit) as well as binary handwritten digits and alphabetic characters (300 ppi, 1-bit). This database is intended to encourage research in off-line handwriting recognition by providing access to handwriting samples digitized from envelopes in a working post office.

Specifications of the database include:

- 300 ppi 8-bit greyscale handwritten words (5632 city words, 4938 state words, 9454 ZIP Codes)
- 300 ppi binary handwritten characters and digits (27,837 mixed alphas and numerics segmented from address blocks; 21,179 digits segmented from ZIP Codes)
- every image supplied with a manually determined truth value
- all data digitized on an Eikonix EC850 CCD scanner from live mail in a working U.S. Post Office
- divided into explicit training and test sets (90% training and 10% testing)
- simulates a 'real' recognition environment: unrestricted for author; unrestricted for writing style; unrestricted for writing implement (pen, pencil, *etc.*); authors had no knowledge their samples were to be used

- performance comparison on the same data sets is possible between researchers.

Suitable for automated handwritten word recognition research, the database can be used for both algorithm development and for system training and testing. The database is a valuable tool for developing the range of techniques needed for high performance handwritten word recognition including preprocessing, segmentation, feature extraction, and classification. The system requirements are a 5.25-inch CD-ROM drive with software to read ISO-9660 format CD-ROMS.

For any further information, including how to order the database, please contact:

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Note: email contact is preferred.

Book Review

3-D Model Recognition From Stereoscopic Cues edited by John E. W. Mayhew and John P. Frisby, The MIT Press, 1991, ISBN 0-262-13243-5, 269 pages.

THIS BOOK IS THE RESULT of research carried out under the UK's Alvey research programme in advanced information technology. The book contains a collection of papers from three projects, namely *The PMF Stereo Algorithm* project, *The 2.5D Sketch* project and *The 3-D Model-Based Vision* project. Each of these projects is arranged into a section, which is preceded by an introduction from the editors describing the objectives of the project together with comments on what actually happened during the course of the project.

The first paper in the book gives a brief summary of the PMF (Pollard, Mayhew, Frisby) stereo correspondence algorithm. The objective of the algorithm is to produce, in real time, local stereoscopic disparity measurements for the construction of 3-D surface descriptions (used in the 2.5D sketch project). The PMF algorithm uses the disparity gradient (DG) measure for matching instead of the conventional measure on absolute disparities. By imposing a limit on allowable disparity gradients a balance between disambiguity and the ability to deal with a wide range of surfaces can be achieved. Experimental results from using artificial as well

as natural stereograms are given and its mathematical properties are discussed. There are also interesting papers on the modification and optimisation of the PMF algorithm as well as its hardware implementation. Following this, there is a description of the novel methods developed in the 2.5D sketch project for deriving, from the depth map produced by PMF, a representation of the 3-D structure of the visible surfaces in the scene.

An interesting technique for the segmentation and representation of arbitrary edges is presented and another paper describes two new (viewpoint invariant) surface reconstruction approaches which use weak continuity (surface depth and surface orientation) constraints. A comparison study was conducted to determine the efficiency of deterministic (simulated annealing) and stochastic (graduated non-convexity) algorithms for visual reconstruction. Weak continuity was also used in scale-space filtering for segmentation and analysis of signals, and was proved to be successful.

There are a number of interesting papers that describe the use of novel architectures, for instance, an implementation of Canny edge detection in a pipelined architecture. There is one on parallel architectures for fast 3-D machine vision which discusses the exploitation of parallelism through spatial, featural and temporal approaches, together with a description of the Multiprocessor Architecture for Vision systems (MARVIN). Another paper describes a 3-D vision system for the visual guidance of a robotic arm carrying out pick and place operations, this being implemented on MARVIN.

Finally, work is reported on the description of the statistical combination of data from multiple sensors, in an attempt to overcome some of the problems that can occur with stereo viewing, the reconstruction of surfaces from data obtained from stereoscopic vision, as well as on the textured surface problems arising in stereo vision.

For anyone interested in vision work this is a book well worth reading.

*Paul Ducksbury and Margaret Varga
Defence Research Agency, RSRE, Malvern, U.K.*

Workshop on Two and Three dimensional Spatial Data: Representation and Standards

7-8 December 1992

Perth, Australia

Overview It is proposed to hold a two-day workshop under the auspices of the Australian Pattern Recognition Society

on issues of representation and standards of 2-D and 3-D spatial representations. This will be held in Perth at Curtin University on 7th and 8th December 1992. The format of the workshop will be a number of invited talks by both national and international researchers. There will be time for discussion and presentations by Australian researchers and commercial users.

Workshop contents The choice and use of representations for two and three dimensional data and information is crucial to the disciplines of:

Computer Vision
Pattern Recognition
Geographical Information Systems
Computer Graphics
Medical Databases and Applications
Remote Sensing
Computer Aided Design
Image Processing
Man Machine Interface
Virtual Reality

Each of these fields is concerned with the processing and analysis of information that can be represented using a variety of techniques. The choice of the particular technique is, to a large extent, dependent on the application and available technology. It is a truism that each discipline makes use of its own particular representation(s) which leads to incompatibility with other disciplines.

It is becoming obvious that there is an increasing interdependence in the above disciplines for representing objects and environments. There is therefore a need to bring together researchers and users in different disciplines to interact and address the issues that arise in different forms of spatial representation. The topics covered in this workshop will include (but not be limited to):

1. Techniques for two and three dimensional spatial representation. There are many different representations (*e.g.*, octrees, quadrees, BReps, CSG trees) used by many practitioners in different disciplines. Presentations of new techniques, extensions and use in new areas will be favoured.
2. Compatibility and standardisation of various representations. There is increasing commonality between the various disciplines (*e.g.*, computer graphics, vision and CAGD, and GIS and remote sensing). Presentation on issues concerned with standardisation of representations across disciplines and interchange of data will be welcome.

3. Abstract models for representing environments. There is a need and interest in different types of representation (*e.g.*, functional and teleological) that can be used to represent spatial data to capture meaning which is difficult to represent in the more traditional methods. Presentations of new models in these and similar directions are welcome.
4. Tools for manipulating spatially organised data. One of the biggest problems with any representation is the manipulation, display etc. of the data. While each discipline has its own means of handling data there is little exchange of ideas across the disciplines. We welcome presentations that describe new tools or the application of existing tools to other disciplines.

Who should attend The workshop should be suitable for people from the academic, applied and industrial research and development communities. It is important for all three areas to be well represented to allow cross fertilisation between 'cutting edge' research and end users.

Deadlines and format

Abstract due 31st August 1992

Final paper 15th November 1992

The abstract should not exceed two A4 pages. The final paper will be expected to exceed 5 pages in 10 point Times font. All papers should be sent to Mrs M. Simpson as the following address:

Mary Simpson

School of Computing
Curtin University
GPO Box U1987
Perth 6001
Western Australia

Tel: +61 (09) 351-7298

Fax: +61 (09) 351-2819

oraprs_workshop@cutmconvax.cs.curtin.edu.au
by email.

Eighth Scandinavian Conference on Image Analysis

25-28 May 1993

Tromsø, Norway

The Eighth Scandinavian Conference on Image Analysis will be arranged by the Norwegian Society for Image Processing and Pattern Recognition (NOBIM) and sponsored by the

IAPR. The conference will be held in Tromsø during 25-28 May 1993. Tromsø, located at latitude 69° 40' N, is Northern Norway's centre for administration and education.

The scientific programme will include several invited speakers. There will be parallel sessions with papers for oral and poster presentation. The conference language will be English. Contributed papers will cover original, unpublished research results, either theoretical or applied. There will be an associated exhibition.

The social programme includes visits to Spitzbergen and North Cape. Participants and accompanying persons are invited to bring cross-country or mountain skiing equipment, as the skiing conditions in the mountains are normally superb in late May. Sea-fishing will also be arranged, and we have a good chance of enjoying all these activities in the midnight sun, which lasts from approximately 20th May until 20th July. Indoor activities will consist of a get-together party on the first night of the conference and the Conference Banquet, both of which are included in the conference fee.

Conference Topics

- image processing and analysis
- pattern recognition
- computer vision
- parallel algorithms and architectures
- neural networks
- remote sensing
- medical and biological applications
- industrial applications

Submission of Papers Papers must be in English. Only full papers will be accepted. Authors are invited to submit three copies of each full paper. The paper should contain:

- title of the paper
- names(s) and affiliation(s) of the author(s)
- brief (200-word) abstract
- name and address for correspondence

All papers should show the name of the first author and be consecutively numbered. In the final version, all pictures must be rasterized. If the length of the paper exceeds eight pages or contains colour illustrations, and additional fee will be added to the registration fee.

Deadlines

Submission of papers	15 th October 1992
Notification of Acceptance	20 th December 1992
Camera-ready copy	1 st March 1993

For all enquiries regarding the conference, please contact:

Kjell Arild Høgda

Forut Information Technology Ltd

P B 2806 Elverhøy

N-9001 Tromsø

Norway

Tel: +47 83 58 622

Fax: +47 83 82 420

Email: scia@conan.uit.no

Note: by simply sending the message `send info` to the above e-mail address, you will automatically be included on the conference mailing list.

Fifth International Conference on the Computer Analysis of Images and Patterns (CAIP'93)

13-15 September 1993

Budapest, Hungary

CAIP is a traditional Central European conference devoted to all aspects of image processing and analysis, computer vision, and pattern recognition. Its main goal is to promote scientific cooperation and contribute to free exchange of ideas, knowledge, and experience between Eastern and Western Europe. Papers devoted to new trends in image analysis, including theory, algorithms and applications, are especially welcome at CAIP'93. Topics of interest include, but are not limited to, the following:

- theory of computer vision and image analysis
- theoretical and experimental evaluation of algorithms
- comparative studies of different approaches
- hierarchical and model-based methods
- new fast and reliable algorithms
- successful applications in real environments
- novel application areas

The scientific program will include regular contributions as well as invited talks given by key speakers sponsored by the IAPR. All accepted papers will be published in the Conference Proceedings. The official language of the conference is English.

Submission of Papers Prospective authors should submit 3 copies of full-length draft papers (maximum 10 A4-sized pages) to:

D. Chetverikov

Computer and Automation Institute

Budapest

P.O.Box 63

H-1518 HUNGARY

Fax: +36 1 1667503

Email: h1180cse@ella.hu

Note: no electronic submissions, please.

Deadlines

Submission of draft papers	15 th January 1993
Notification of acceptance	15 th April 1993
Camera-ready papers	15 th July 1993

Seventh International Conference on Image Analysis and Processing

20-22 September 1993

Monopoli (Bari), Italy

The Italian Chapter of the International Association for Pattern Recognition (IAPR-IC) announces the 7th International Conference on Image Analysis and Processing, which will be held in Bari during 20-22 September 1993. The conference will consist of both invited and contributed papers. Contributions are expected on the following topics:

- Active Vision
- ASIC in Vision Modules
- Computer Vision System
- Data structures and representations
- Feature Extraction
- Geometric Modeling
- Human Perception and Computer Vision
- Image Analysis
- Language for Image Modeling
- Processing and Retrieval
- Motion Analysis and Time Varying Images
- Neurocomputing for Recognition

- Parallel Computer Architectures
- Pattern Recognition
- Picture and Video Coding

with applications in areas such as Industrial, Medical, Biological, Astronomical, Robotic Vision, and Automatic Inspection.

Submission requirements Researchers involved in the aforementioned or closely related fields are solicited to submit 4 copies of a 2000 words extended abstract of their work, in which the original contributions are high-lighted. The author(s) name and the affiliation must *not* appear in the extended abstract. The accompanying letter must report the names of all authors, their affiliation and which topic(s) of the conference the work is referred to.

Please mail this material before 15th January 1993 to:

Prof. Sebastiano Impedovo

7ICIAP General Chairman
Dipartimento di Informatica
Università di Bari
Via Amendola, 173
70126 Bari
Italy

Tel: +39-80-243278 / +39-80-243295

Fax: +39-80-243142

Note that accepted papers will appear in the proceedings book only if presented at the conference.

Important Dates

Extended abstract submission	15 th January 1993
Acceptance notification	30 th April 1993
Camera-ready paper	at the conference

Conference Organization

General Chairman	Sebastiano Impedovo, Università di Bari
Vice Chairman	Vito Di Gesù, Università di Palermo
Programme Chairman	Virginio Cantoni, Università di Pavia Renato Stefanelli, Politecnico di Milano
Scientific Chairman	Stefano Levialdi, Università di Roma "La Sapienza"
Local Chairman	Maria F. Costabile, Università di Bari

Special Issue of the Indian Journal of Pure and Applied Mathematics

The Indian Journal of Pure and Applied Mathematics (IJPAM), published by the Indian National Science Academy, has decided to publish a special issue on Pattern Recognition, Image Processing and Applications, in the first quarter of 1993. Pattern recognition, along with its allied fields, such as image and speech analysis and computer vision, has become an important topic of research and development in the last three decades. The IJPAM plans to bring out this special issue with emphasis on mathematical and statistical aspects, bringing the subject up to date and giving a discussion on open problems in relation to parametric/non-parametric, supervised/non-supervised methods of recognition and learning. Contributions in the fields of remote sensing, medicine, robotics, industrial applications, and fifth-generation computer systems in the above contexts are also welcome.

Prospective authors are requested to submit their papers on the topics mentioned above or on related topics. Reporting of new research or state-of-the-art articles are solicited.

Authors should send their intention of writing a paper to the Guest Editor at the address below as early as possible. The complete manuscript should be prepared as per the IJPAM format by 30th September 1992.

Prof. D. Dutta Majumder, FNA

Chairman, National Centre for Knowledge-Based Computing
Electronics and Communication Sciences Unit
Indian Statistical Institute
203, B. T. Road
Calcutta 700 035
India

Forthcoming Conferences, Workshops and Events

Please notify the editor of any additions to this list.

DATE	EVENT	LOCATION	CONTACT ADDRESS [SPONSOR]
30 Aug-3 Sep 1992	11 th International Conference on Pattern Recognition	The Hague, The Netherlands	11 th ICPR Secretariat, Delft University of Technology, P. O. Box 5031, 2600 GA Delft, The Netherlands (icpr@et.tudelft.nl) [IAPR]
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)
7-8 Dec 1992	APRS Workshop on 2-D and 3-D Spatial Data	Perth, Australia	Mary Simpson, School of Computing, Curtin University, GPO Box U1987, Perth 6001, Western Australia [IAPR]
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 th Israeli Conference on AI and Computer Vision	Tel-Aviv, Israel	Shimon Edelman, 9 th IAICV, Dept. of Computer Science, The Weizmann Institute of Science, 76100 Rehovot, ISRAEL
19-23 Apr 1993	International Symposium 'Operationalization of Remote Sensing'	Enschede, The Netherlands	Prof. J. L. van Genderen, ITC, P O Box 6, 7500 AA Enschede, The Netherlands
25-28 May 1993	8 th Scandinavian Conference on Image Analysis	Tromsø, Norway	Kjell Arild Høgda, Forut Information Technology Ltd, P B 2806 Elverhøy, N-9001 Tromsø, Norway (scia@conan.uit.no) [IAPR]
14-16 Jun 1993	Image Processing: Theory and Applications	San Remo, Italy	IPTA'93 Secretariat, c/o DIBE, University of Genoa, Via Opera Pia 11A, Genoa, I-16145 Italy (ipta@dibe.unige.it) [AEI, EURASIP, IEEE]
13-15 Sep 1993	5 th International Conference on the Computer Analysis of Images and Patterns (CAIP'93)	Budapest, Hungary	D. Chetverikov, Computer and Automation Institute, Budapest, P.O.Box 63, H-1518 HUNGARY (h1180cse@ella.hu) [IAPR]
20-22 Sep 1993	7 th International Conference on Image Analysis and Processing	Bari, Italy	Prof. Sebastiano Impedovo, 7ICIAP General Chairman, Dipartimento di Informatica, Università di Bari, Via Amendola, 173, 70126 Bari, Italy