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

International Workshop on Biomedical Image Registration - Bled, Slovenia



Bled, Slovenia

The International Workshop on Biomedical Image Registration (WBIR'99) was held in August with a total of more than 40 participants. In modern medicine and biology, a valuable method of gathering knowledge about healthy and diseased organs, tissues, and cells is the integration of complementary information from images of these objects. Such information may be obtained by different modalities, different image acquisition set-ups, or different object preparation procedures. A necessary pre-processing step for the integration of image information is image registration by which images, containing complementary information, are brought into the best possible spatial correspondence with respect to each other. Registration is finding increasing use in diagnosis, treatment planning, and surgical guidance, as physicians combine information about location, form and function to sharpen their understanding of pathology in clinical situations.

The aim of WBIR'99 was to bring together scientists who devise image registration techniques and clinicians who use these techniques for the purpose of fostering dialogue and debate on important problems and promising solutions associated with biomedical image registration.

The international flavour of these efforts is indicated by the fact that the attendees of the workshop represented 14 countries. The idea to establish an international workshop entirely devoted to biomedical image registration was motivated by the fact that image registration had become a matured discipline with many contributions appearing each year. We sincerely believe that WBIR'99 will be the first in a series of regular events.

Each paper submitted to the workshop was reviewed by at least two referees selected from the Program Committee. The final program consisted of 20 presentations, 4 invited talks, and 4 discussions on important aspects of the workshop (*classification of registration methods, the role of image registration in image guided surgery, the role of image registration in brain mapping, and registration validation*).

The social program included a Welcome Party, a trip with boats to the small island on the lake and a delicious banquet in the former summer residence of the Yugoslav kings. The success of WBIR'99 is also due to the support of IAPR and other sponsors and the organizing committee would like to thank them sincerely.

Franjo Pernus



PROFILE OF TC 13 ASTRONOMY & ASTROPHYSICS

TC13 was set up in the 1990s to further a range of computing and astronomical/astrophysical interests. Regular workshops and conferences did take place, but it was felt by various people that somewhat greater organisational stability and structure was needed.

Initial members, and today's members, included people working on data produced by X-ray and other high energy astronomical instruments, in the visual such as Hubble Space Telescope, in the infrared and ultraviolet, and right through to radio astronomy. Satellite-borne observatories and instruments were well-represented as were also ground-based observing capability. Methodology interests included statistical modelling, classification - e.g. galaxy morphologies or spectra, combinatorial data analysis, image and signal processing, visualization and display technologies, - in fact all of the different areas which have pattern recognition as their common theme.

By about 1994, a few of us in TC13 thought it would be a good idea to bring our collective expertise to bear on some targeted problems. Test collections of images and other signals were collected. Before long, a funded project was mooted. The result of this was that in January 1995, a scientific network funded by the European Science Foundation was set up. This network lasted three years and was titled *Converging Computing Methodologies in Astronomy*. It brought forth a wealth of results, in image

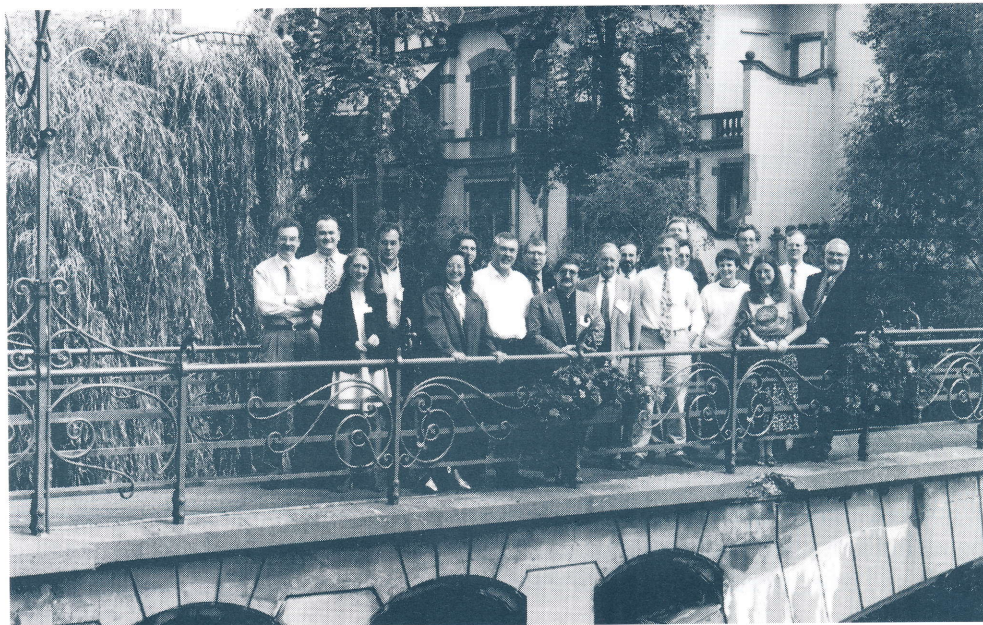
processing, in the pivotal theme for modern astronomy (and we can add, of modern medical signal processing and of much else besides) of image and signal fusion, and in information handling and processing technologies associated with electronic publishing. In the latter area, the reader will straight away see pattern recognition aspects of data mining.

The themes covered by the CCMA network are still highly topical. Information on them, and on various workshop and conference proceedings, can be found at <http://astro.u-strasbg.fr/~ccma> TC13 spun off many other activities. Associated were various initiatives relating to online library and information services. Extensive work over many years on wavelet and other multiscale transform methods received motivation from TC13's activities. The official organisational bodies of astronomy, for example Commission 5, *Documentation and Astronomy Data* and in particular the *Working Group on Information Handling*, were kept regularly informed of TC13's work. Statistical software repositories were established. Recently again the European Science Foundation has played a role in funding new initiatives. A workshop held in September 1999 on *The Virtual Observatory: Methodologies for Data Handling*, was followed up in October 1999 with a proposal for a 5-year consortium.

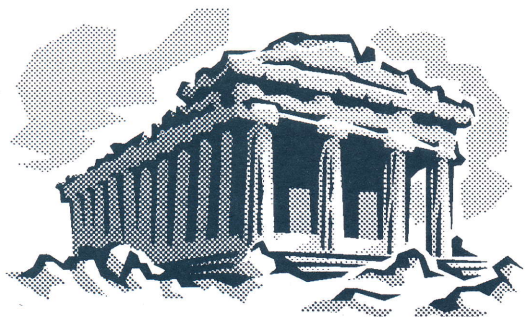
The spin-off and kindred activities and initiatives to which TC13 has given birth over the years have been tremendously productive; we certainly hope it continues. Information on TC13 can be found at <http://www.ifcai.pa.cnr.it/TC13>. Please let us know if you wish to be kept informed of future initiatives. My thanks in particular to Cettina Maccarone (IFCAI, Palermo) and Vito Di Gesú (Universita di Palermo), for contributions to this report on TC13.

Our photograph shows
A Workshop
resulting from
TC 13's
earlier
activities

Current and past
TC 13 officers shown here
include:
Cettina Maccarone
Albert Bijaoui
Vito Di Gesú and
myself,



Fionn Murtagh



FORUM

PUBLISH OR DIE ?

Despite all the attempts that have been made over the past years to interest more researchers from the industrial sector to take part in IAPR, it is an undoubted fact that the majority of us are still from academia. We teach, administer and research. We have a love-hate relationship with teaching: students are rewarding, examining is hell. Administration is abhorred by all right thinking academics and best to be avoided whenever possible. When done badly it causes grief, when done well it attracts even more to be done.

So what about research? Research is not all fun, especially when it comes to writing grant applications and drafting contracts but the core activity is all-absorbing. It is probably true that most academics have been attracted into university life by the prospect of engaging in challenging research programmes and most would resign were they to be told that they could no longer spend a substantial fraction of their time in this type of activity. But there is a sting in the tail of all research work: sooner or later it has to be published.

The pressure to publish does not just follow from the need to let the scientific community know one's latest results. The real pressure stems from the link between a 'good' publishing record and personal promotion and too often 'good' is equated with 'large'. The old tailor's saying 'never mind the quality, feel the width' should be adapted for publications to read 'never mind the scientific value, count the number'. The sad consequence of this philosophy is that journals (and conference proceedings) are jam-packed with feeble reports of half-baked, inconclusive fragments of experiments and theoretical analyses which will never be completed, often because the PhD student who performed them has now left and become an accountant!

A conspiracy theorist might suggest that journal publishers (who are always looking for material and for the chance to start a new journal) are in league with the academic and government authorities who use publishing output quantity as a measure of academic excellence. Why else would anyone take seriously the process of journal paper publishing when (if we can believe what we have heard) the average number of readers per published paper is less than two?

This is obviously not the right way to propagate new scientific facts and ideas. It also means that there are so many papers to be read (not read?) that the more worthwhile ones get lost in the crowd. As there is no time to read all that is published, the usual solution is to photocopy and file, especially when this chore can be delegated to a student. We need concerted action. I suggest we resolve, as a scientific community, to publish no more than once a year and only then if we are sure that we have something worth saying. Perhaps then we will have time to do some real research.

Michael Duff



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**For Members' address changes please check the
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IMAGE ANALYSIS AND COMPUTER VISION THE PAST HALF-CENTURY

Professor Azriel Rosenfeld was the first of our number to be awarded IAPR's prestigious King-Sun Fu Prize and has been the most prolific producer of scientific publications in our field over a period of several decades. The Newsletter asked him for his views on what has been achieved so far - and what should be our aims for the third millennium.

Almost as soon as digital computers became available, it was realised that they could be used to process and extract information from digitized images. Initially, work on digital *image analysis* dealt with specific classes of images such as text, photomicrographs, nuclear particle tracks, and aerial photographs; but by the 1960s, general algorithms and paradigms for image analysis began to be formulated. When the artificial intelligence community began to work on robot vision, these paradigms were extended to include recovery of three-dimensional information, at first from single images of a scene, but eventually from image sequences obtained by a moving camera; at this stage, image analysis had become *scene analysis* or *computer vision*.

At first, image processing had an important advantage over image analysis: there already existed a well-developed theory of signal processing that generalised more or less straightforwardly to two-dimensional signals (in particular, to images), and that applied to digital as well as analogue signals. For image analysis, on the other hand, there was little or no pre-existing theory. Basic signal analysis techniques such as Fourier analysis or matched filtering can be applied to images, but image analysis applications almost always require more powerful techniques; the patterns of interest for image description purposes are not sinusoids and often cannot be specified exactly. Thus progress on these applications was accompanied by the invention of many of today's basic methods of image analysis.

General theories of image analysis were slow to emerge at first because image analysis systems were developed to deal with specific classes of images and to derive domain-specific descriptions of these images. However, although the types of images that needed to be analysed were very different, the types of analyses that needed to be performed on these images had many things in common. Image analysis almost always involves a few basic processes: distinguishing certain parts of the image (representing characters, blood cells, tumours, wheat fields,

particle tracks, fingerprint ridges, facial features, ...); measuring properties of these parts, or relations among the parts; and using the values of these properties or relations to classify or describe the parts, or to describe or classify the image as a configuration of parts.

In many of the areas of application of image analysis, the 'objects' that appear in the images are essentially two-dimensional. In other areas, the objects are three-dimensional, but they are viewed from a known direction, so that the images show known projections of the objects. This made it possible to regard a two-dimensional image as an adequate representation of the scene containing the objects, and to analyse the scene using an image analysis paradigm. When a scene is imaged from an unknown viewpoint which is not very distant relative to the sizes of the objects in the scene, the image can no longer be regarded as an adequate representation of the scene, since it no longer shows a known projection of the objects, and objects may also (partially) occlude one another. Moreover, the scene illumination may not be known (and objects can also cast shadows), so that the surface lightnesses of the objects may vary unpredictably. Thus objects in the scene may not give rise to regions in the image that have known shapes or simple lightness functions, and 'edges' in the image may result from abrupt changes in illumination, surface reflectivity, or surface orientation, so that regions that are separated by edges may not belong to different objects.

In such situations, the image analysis paradigm is evidently inadequate. The need for a new paradigm became apparent when the first artificial intelligence laboratories were established and began to work on problems of robot vision; a robot must manipulate, or navigate among, objects that are close to it and lie in arbitrary directions relative to it, in a space that is not uniformly illuminated. In the 1960s the artificial intelligence community began to use the term 'scene analysis' to refer to the task of describing the scene that appears in an image; in later years, the term 'computer vision' became more popular.

A more complex paradigm was needed to describe the process of inferring a description of a three-dimensional scene from one or more images. This paradigm incorporated processes that *recover* information about relative depth from the images, or from sets of local features detected in the images. It also involved model-based processes that determine the identities of visible objects and their layout in the scene. Today's computer vision systems use such processes to deal with sequences of images of dynamic



scenes, containing moving objects and obtained by moving cameras.

As these brief historical remarks indicate, research on image analysis and computer vision over the past half-century has led to the formulation of basic paradigms. It has also led to many elegant mathematical models and algorithms for the processes used in these paradigms. Unfortunately, most vision problems, even those that were first tackled in the 1950s, are mathematically ill-defined (reading handwritten words, counting cells, recognising buildings). Real-world visual domains do not satisfy simple mathematical (even probabilistic) models. Even if adequate scene models could be formulated, problems that involve inferring information about a scene from images are often mathematically ill-posed or computationally intractable; but the primary reason why vision is hard for computers is that the scene models used (often tacitly) in today's computer vision systems are unrealistic, and this situation is likely to persist for a long time to come.

The inadequacy of our scene models does not imply that computer vision systems will never perform adequately. Indeed, in many areas of application, successful image analysis and computer vision systems have been developed and marketed, even though the classes of scenes involved can be 'modelled' only crudely, and the systems generally make use of *ad hoc* methods.

An 'existence proof' for the feasibility of computer vision tasks is that animals (and humans) use vision quite effectively in the real world. A possible basis for this is that biological visual systems make use of redundant visual data and process it on redundant 'pathways'. Computer vision systems usually avoid such redundancy in order to reduce computational cost. But redundancy may allow the biological systems to detect (and correct) processing errors, since they are likely to give results that are inconsistent or non-persistent. When computer vision systems can afford to incorporate greater redundancy, their performance will improve. Computer vision systems are just reaching the levels of processing power that will allow them to handle, in real time, amounts of input data comparable to those handled by biological visual systems, and to apply multiple processing techniques to the data. As a result, the research of the past half-century has begun to pay off; image analysis and computer vision techniques are being used successfully in many working systems.

The techniques used nowadays in these systems are often quite simple, even 'brute force'; but more complex algorithms, which today can only be demonstrated in the laboratory, will run at video rates on tomorrow's processors. As processing power continues to increase, such algorithms will begin to be applied to real-world problems; as a result, the areas of successful application of computer vision will continue to expand.

Azriel Rosenfeld
University of Maryland, College Park

FROM OUR AUSTRALASIA PACIFIC CORRESPONDENT

Anthony Maeder

As the DICTA-99 conference in Perth (Dec 7-8) approaches, we once again need to assess the role of APRS in promoting Pattern Recognition in Australia. In an environment where there is so much local activity, we have felt it easier to run national events than ones at state level, to avoid competing. We feel our members gain more from the broad interactions such national scale events bring. We have tried to run some joint meetings with other national groups, but distance and geography is a big disadvantage. We will consequently concentrate on joint activities with other Australian organisations in the future.



We seem to be surrounded by many regional and national conferences in areas relevant to PR at present: image processing, signal processing, AI, cognitive/psychology, statistics/mathematics, not to forget the numerous applications areas! Nevertheless, there always seem to be more *discipline* oriented meetings, than specific *applications* meetings: we have few events where for example *audio and speech* researchers could meet for papers only on that area. Also, many local conferences are beginning to publish papers (or even abstracts) electronically, and concentrate more on *people interactions* during the event. Some smaller workshops lately have even been run using video-conferencing. What will be the popular model for conferences in the future? Will we have a binary system of large, broad, national/international events with highly selective reviewed papers where experts transfer knowledge to others, and smaller highly specialised *all-comers* events where participants mostly interact as peers?

A recent development in applications in Australia has been the announcement of several new government defence contracts for high-tech development work, on our submarines, helicopters, fighters and radar systems. Boeing Australia, which recently set up national headquarters in Brisbane, has begun a \$2-billion 7-year *early warning* system project, which will involve a workforce of 2000 at peak! Other projects of comparable magnitude are underway in Melbourne and Canberra, by other contractors. The job market looks good for appropriately qualified engineers!

See also overleaf: IVCNz 99 Report

From the ExCo

The Executive Committee held its annual meeting in Bangalore, India, Sept 21, during 5th ICDAR. Various topics were discussed and a short summary is given below.

Membership lists and Constitution and Bylaws of member societies.

As announced in previous issues, all member societies were officially requested to submit a list of their members. At the time of the meeting, about half of the member societies had already done so, and at the time of writing this, more material has been received. Regarding the number of individual members, in some cases there are large discrepancies with the number of Newsletters distributed. Since the number of individual members determines the number of representatives on the Governing Board, this issue will have to be resolved. Member Societies for which a significant discrepancy exists will be contacted to try and resolve the problem.

Status of TCs

As usual, the status of the various TCs was reviewed. Well before the meeting, the TCs were asked on various occasions to submit a status report. It turns out that while most of the TCs are doing (very) well, a few of them are inactive, some of them not even replying to messages. This is, of course, an undesirable situation and as a result of the discussions, the following measures were taken or are about to be taken: For TC3 it is considered to strengthen the Machine Learning part by appointing a co-chair for that particular area. The chairman of TC5 having expressed his wish to resign, Ihsin Phillips was approached and accepted to chair. She was appointed as such. After discussions in TC13, Fionn Murtagh volunteered to chair. He was appointed as such.

There are some inactive TCs for which no solution was found yet. It is clear that TCs which have not reported any activity during a considerable time cannot be maintained. The Executive Committee may put forward proposals to the Governing Board for cancellation of such TCs.

Conferences and Meetings Committee.

The chairman of the Conferences and Meetings Committee, Anil Jain has expressed his wish to resign as chairman for personal reasons. He will remain on the committee as a member. Brian Lovell was appointed as the new chairman.

Guidelines for the organisation of ICPRs.

A new set of guidelines was prepared by the Conferences and Meetings Committee. This was discussed at the ExCo meeting. It was generally felt that the document needed some more structure. A new version has been prepared in

the meantime and approved by the Committee and will soon be available on the IAPR website.

Admission to IAPR Sponsored Conferences.

From time to time, the executive committee has become aware of problems for some IAPR members to obtain visas to attend IAPR sponsored conferences and workshops. While most of these are of bureaucratic nature and are resolved in time, the ExCo would like to restate IAPR policy in this matter: First, the organisers of an IAPR sponsored conference must guarantee that the hosting country does not have any visa regulations which would forbid the application of Article 10.5 of the IAPR Bylaws. Second, IAPR will not give in to any attempt by any country to restrict IAPR admission policy (Conference organisers shall report such attempts immediately to the Executive Committee). We urge organizers of conferences and workshops to get assurances from the appropriate offices of host countries that this policy is not in conflict with their policy on visas. This is particularly critical for organizers of large IAPR conferences and we strongly recommend that this matter should be addressed before a location is proposed as a conference site.

*Edzard S. Gelsema
Gabriella Sanniti di Baja*

Image and Vision Computing New Zealand 1999 (IVCNZ99)

This conference was held in the Engineering School at the University of Canterbury. It drew 80 participants and 50 papers were presented. This year's conference was a *low gloss affair* with costs kept to a reasonable minimum and the opportunities for informal discussion maximized.

The conference included two keynote speakers. These were Professor Bobby Hunt of Hunt and Andrews fame who gave an outstanding presentation on the current state of the assessment of image quality. Bobby Hunt is based at the University of Arizona. The second keynote speaker was Professor Rick P. Millane of Purdue University, who spoke to his specialist topic of Image Reconstruction in X-ray Crystallography.

The meeting was notable for the informality and quality of the discussion that followed many of the presentations and the poster sessions were an outstanding success. Posters were displayed in a room used for most of the conference catering. This had the consequence that in addition to the formal poster sessions, they became the focus for technical discussion. The conference convenor Phil Bones and his organising committee, consisting of Richard Lane, Michael Hayes, Andrew Bainbridge-Smith, Cressida Harding, Peter Hilton, David Pairman, and Heather North are to be congratulated on a very successful conference.

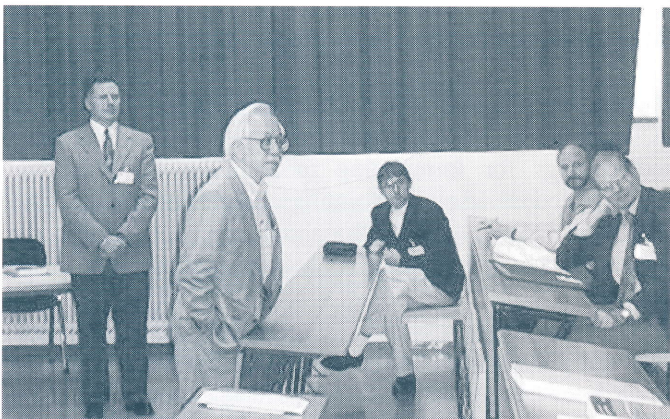
Bob Hodgson

IAPR SPONSORED MEETING REPORTS

8th Conference on Computer Analysis of Images and Patterns 1 -3 September 1999, Ljubljana, Slovenia

The CAIP series of conferences started 14 years ago in Berlin and served initially as a forum for meetings between scientists from Western and Eastern-bloc countries. Political circumstances have changed dramatically since then and such contacts are fortunately no longer subject to obstacle. Whilst CAIP conferences are still rooted in Central Europe, they attract participants from all over the world.

From 120 submissions, the final program consisted of 47 oral and 27 poster presentations, with authors from 25 different countries. The proceedings (order form: <http://razor.fri.uni-lj.si/CAIP99>), include 2 of the 5 invited lectures. Invited lectures were presented by T S Huang, L Van Gool, A Galalowicz, V Hlavac and M Viergever.



*Franc Solina, Tom Huang, Ales Leonardis,
Dimitry Chetverikov and Claus-E Liedtke*

Having the conference in the university lecture halls had several advantages. We could visit laboratories of our hosts and easily use the university Internet connections. The university lecture halls that we used during the conference were only a short walk from our hotels in the center of Ljubljana. These walks enabled discussions between participants which were often continued in hospitable restaurants and pubs on the way back to the hotels. Ljubljana is a small, nice, and friendly city. The social program added a lot to the pleasant atmosphere of the conference. Let me mention only the visit of the Postojna caves near Ljubljana. Besides being huge and very beautiful, the caves are the habitat of a unique species, a blind lizard Proteus which lives all its life in underground rivers and lakes. For us, vision researchers, it was interesting to see an amphibian which can successfully survive in a hostile environment without any vision abilities.

CAIP 2001 will be organized by Prof Skarbek in Poland.

Vasek Hlavac

First International Workshop on Machine Learning and Data Mining in PR 16 - 18 September 1999

MLDM'99 was held in Leipzig, the famous old town of merchants in the centre of Germany. Twenty-two researchers from ten countries presented their work on learning and data mining. The workshop was co-chaired by Petra Perner from Institut fuer Bildverarbeitung und angewandte Informatik (IbaI) in Leipzig and Maria Petrou from the University of Surrey (UK). The local organization was done by the Institut fuer Bildverarbeitung und angewandte Informatik.

Two invited lecturers - M. Petrou and S. Weiss (IBM Research Center Yorktown Heights, USA) addressing Learning in Pattern Recognition and Predictive Data Mining Methods, respectively, gave an overview over the main topics of the workshop. The program of the workshop comprised six sessions: Neural Networks applied to Image Processing and Recognition, Learning in Image Pre-Processing and Segmentation, Image Retrieval, Classification and Image Interpretation, Symbolic Learning and Neural Networks in Document Processing, and Data Mining.

The first day started with the invited lecture of Sholom Weiss who gave an excellent overview on past research objectives, the lessons learned from it and the recent research directions in predictive data mining. After this, lectures were presented on approaches to Hough Transform and Self Organising Maps, Cellular Neural Networks for Shape from Shading, Unsupervised Learning for Image Pre-Processing, Magnetic Resonance Image Estimation, Extraction of Local Structural Features, and Non-hierarchical Clustering for Information Retrieval.

The second day started with an impressive combination of the invited paper on Learning in Pattern Recognition and a lecture on Generalized Fuzzy Aggregation Operators, both given by Maria Petrou. Then presentations concerning the Automatic Design of Multiple Classifier Systems, a Comparison of Neural Networks and Decision Trees, Learning Techniques in Document Processing, Recognition of Printed Music Score, Data Mining from Interactions of Humans and Systems, and a Data Mining Application for Environmental Risk Monitoring followed.

As it was planned there was much time for discussion after each talk which was used extensively by the auditorium to the benefit of all attendees. The proceedings of the workshop have been published by Springer in the series "Lecture Notes in Artificial Intelligence" (No. 1715, ISBN 3-540-66599-4, www.springer.de).

The pleasant atmosphere during the workshop was completed by a pleasant social program. It started with a small opening ceremony in the evening before the workshop, a good opportunity to become familiar with the participants. A sightseeing tour guided by IBAI - co-workers gave the possibility to admire the wonderful reconstruction of the city. But the top event was the banquet in the oldest coffee restaurant of Europe, the *Arabian Coffee Tree*, where original saxonian dishes were served.

The next workshop will be held in 2001 at Monastery Seon, near Munich. Detailed information can be found on <http://members.aol.com/mlm2001.htm>

Herbert Jahn

**International Workshop on
Fundamental Structural Properties in
Image and Pattern Analysis
6 - 7 September 1999, Budapest, Hungary**

FSPIPA'99 was held in conjunction with the 8th International Conference on Computer Analysis of Images and Patterns (Ljubljana, Slovenia). It was organised by the Computer and Automation Research Institute of the Hungarian Academy of Sciences (MTA SZTAKI). This 2-day workshop gave a good forum to discuss some interesting specific topic with the 30 participants, including 17 speakers coming from 13 different countries.

FSPIPA'99 was a forum for discussing the interrelations between image structures and the real world that digital images describe. Fundamental structural properties (FSPs) of the physical world, such as symmetry, scale-space and self-similarity, underlie the basic principles of natural sciences, including the key laws of physics and biology. They are intrinsic to the natural and artificial processes that form shapes and patterns. The appearance of objects and events, the way we perceive and describe them, are strongly influenced by the underlying FSPs whose perceptual value has been demonstrated in numerous studies. Fundamental structural properties therefore provide a solid basis for generalisation and unification of mathematically diverse methods of computer vision. The aim of FSPIPA'99 was to explore these prospects.

FSPs are present, explicitly or implicitly, in all main areas of image processing and analysis, including texture, shape, and motion. Examples of related tasks and applications are image and motion segmentation, anisotropic diffusion, edge detection, pattern orientation, flow-like patterns, retrieval of specific structures from image databases, detection of structural defects for scientific and industrial purposes, finding periodic activities in video sequences, symmetry analysis of biological objects and chemical structures, and many others. There are practical problems, for instance, in video coding, multimedia and medical imaging, where the major structural features of an object are sufficient for its presentation.

The workshop addressed major problems and results related to the role of symmetry, self-similarity, anisotropy, regularity and structural complexity in computer vision and human perception. It was jointly organised by Image and Pattern Analysis Group of SZTAKI, represented by Dmitry Chetverikov, and Analogical and Neural Computing Systems Laboratory of SZTAKI, represented by Tamas Sziranyi. The Program Committee members were F. Bruckstein (Israel), D. Chetverikov (Hungary), X. Descombes (France), T. Ebrahimi (Switzerland) L. Florack (The Netherlands), W. Kropatsch (Austria), T. Lindeberg (Sweden), G. Sommer (Germany), and T. Sziranyi (Hungary).

After careful selection, 14 regular papers were accepted for presentation at the workshop. These regular contributions, as well as two of the three invited papers appeared as full-length papers in the workshop proceedings. The volume was published by the Oesterreichische Computer Gesellschaft (OCG, The Austrian Computer Society) under the title 'Fundamental Structural Properties in Image and Pattern Analysis 1999', edited by D. Chetverikov and T. Sziranyi, in the series 'Schriftenreihe der OCG', Band 130, ISBN 3-85403-130-0. To characterise the event, we bring out our three invited speakers:

In his invited talk **Tony Lindeberg** (Royal Institute of Technology, Stockholm) reviewed a systematic methodology for formulating mechanisms for automatic scale selection when performing feature detection. An important property of the proposed approach is that the notion of scale is included already in the definition of image features.

Dietmar Saupe (University of Leipzig, Germany) gave an invited talk on image model in fractal coding. Fractal coding is based on the assumption of self-affinity or self-similarity. In image coding blocks of an image can be approximated by extracting larger blocks from elsewhere in the image, and by applying decimation and a non-linear intensity transformation. The obtained 'collage' of the original image can be recovered up to a small loss by an iteration procedure at the decoder. In this talk we could critically evaluate this model both in theory and in experimentation.

Hagit Zabrodsky (Haifa University, Israel) devoted her invited lecture to symmetry as another basic structural property of two- and three-dimensional shapes and objects. She demonstrated symmetry as a continuous feature and defined a Continuous Symmetry Measure (CSM) to quantify the 'amount' of symmetry of different shapes and the 'amount' of different symmetries of a single shape. Computational methods have been developed to compute the CSM values with respect to any point symmetry for any shape or pattern in any dimension. A preliminary study showed that the Symmetry Measure developed, is commensurate with human perceptual experience. The computational approach can embed both the hierarchical and

continuous nature of symmetry of objects. Thus global and local features can be evaluated for their symmetry content.

Lectures were followed by many questions and interesting discussions. The social events (excursions in the Buda-hills, the evening parties, walking in the city) and the familiar style of technical discussions formed this workshop to be a fruitful and pleasant meeting.

The participants of FSPIPA'99 shared the opinion that the workshop was a small but highly professional, useful and friendly, purely scientific event free of commercial spirit. For us, the workshop co-organisers, it was a special pleasure to see colleagues who are committed to science and scientific truth, in general, and to understanding the fundamental laws of the visual world, in particular

FSPIPA'99 was sponsored by the ERCIM, the International Association for Pattern Recognition, the Hungarian National Committee for Technological Development (OMFB), the MTA SZTAKI of the Hungarian Academy of Sciences, and the Hungarian Association for Image Analysis and Pattern Recognition. Their support is acknowledged with sincere gratitude. We hope that FSPIPA'99 has contributed to better understanding of the mechanisms of vision in man and machine.

Dmitry Chetverikov, Tamás Sziranyi

The 10th International Conference on Image Analysis and Processing (ICIAP'99) 27 - 29 September 1999

The Italian Chapter of the IAPR has organized its 10th biennial meeting in Venice, this year. Yet another conference on Image Analysis, and yet another meeting in Venice - one may say. So, the organizers of the present edition - Vito Roberto (Udine), Virginio Cantoni (Pavia) and Stefano Levialdi (Rome I) - prepared a few solutions to address such concerns.

One main track of ICIAP'99 was on visual systems as fundamental components of intelligent systems, enabling effective behaviour in complex environments, and establishing more advanced forms of communication. A number of special sessions were planned to grasp some hot subjects: Advanced Video-based Surveillance Systems; Graph-theoretic Techniques in Computer Vision; Design and Evaluation of Visual Interactive Systems. A Young Scientists Forum - dedicated to the memory of Professor Piero Zamperoni - collected contributions from a new wave of researchers from all over the world.

The talks delivered by the invited speakers reflected the main track reported above: 'The Laminar Architecture of Visual Cortex and Image Processing Technology' (Stephen Grossberg, University of Boston); 'Learning Visual Operators from Examples' (Hans Knutsson, University of Linköping); 'Face Processing and Recognition Using

Learning and Evolution' (Harry Wechsler, George Mason University); 'Machine Vision for Medical Image Analysis and Virtual Surgery' (Nicholas Ayache, INRIA, Sophia Antipolis); 'Visualizing the Potential of Interactive Systems' (Harold Thimbleby, University of Middlesex, London).

Two awards were assigned during the Conference: the *Best Student Paper Award* dedicated to the memory of Professor Massimo Savini - won by F. Balado Pumarino and O.Florez (University of Vigo, Spain) for the paper: 'A Two-stage Codebook Building Method Using Fast WAN'; the *Best Paper Award*, dedicated to Professor E.R.Caianello, was assigned to the paper 'Memory-based Forecasting of Complex Natural Patterns by Retrieving Similar Image Sequences', by K.Otsuka, T.Horikoshi, S.Suzuki and H.Kojima (NTT Cyber Space Laboratories, Yokosuka, Japan).

The Zitelle Congress Center



The Conference took place in a historical building designed by the great architect Andrea Palladio - the Zitelle college, now a congress centre. The building is in front of Saint Mark's square (image acquisition was mandatory!), but on a separate island - the Giudecca - and so almost untouched by the stream of tourists invading Venice in September. Another challenge to the image acquisition devices was the Ca' Zenobio palace, where the social dinner took place.

A few figures about the Conference: 352 submissions, 166 presentations in the ordinary sessions, 235 attendees from 30 countries: numbers never attained in the previous editions of the same conference.

The Proceedings, published by the IEEE Computer Society Press, ISBN 0-7695-0040-4, are available from the agency Consulta Umbria, Piazza Italia 9, Perugia (Italy), e-mail: consulta.umbria@bieffe-service.it

Vito Roberto

FORTHCOMING SPONSORED MEETINGS

11th Portuguese Conference on PR (RecPad) 11 - 12 May 2000, Porto, Portugal

RecPad 2000 starts a new cycle of conferences organised every two years with a broad spectrum, having specialised workshops in intermediate years. A special poster session for young scientists will be organised. Undergraduate and graduate students are encouraged to submit their work.

Topics to be addressed include, but are not restricted to:

- Pattern Recognition
- Image Processing & Analysis
- Computer Vision
- Signal Processing
- Neural Networks
- Image in Graphics
- Image and Video
- Morphology
- Coding

Please submit papers, in English, maximum 12 double-spaced pages with covering page containing full contact details and email address to:

RecPad 2000, INEB-Instituto de Engenharia Biomédica, Praca Coronel Pacheco, 1 4050-453 Porto, Portugal.

Abstract Deadline: 17 December 1999
Camera Ready Copy: 24 March 2000

First International Workshop on Multiple Classifier Systems 21 - 23 June 2000, Cagliari, Italy

The main goal of this workshop is to assess the state of the art of the theory and the applications of multiple classifier systems and related approaches. Contributions from all the research communities working in the field are welcome in order to compare the different approaches and to define the common research priorities. Special attention is also devoted to assess the applications of multiple classifier systems and the potential market perspectives.

Oral presentations will cover the following topics:

- Theoretical foundations of multiple classifier systems
- Methods for classifier combination and selection
- Neural network ensembles
- Hybrid systems
- Learning in multiple classifier systems
- Related approaches
- Applications

Please submit up to 12 A4 pages to:

Fabio Roli, Electrical and Electronic Engineering Dept,
University of Cagliari, Piazza d'Armi 09123 Cagliari Italy
roli@diee.unica.it; <http://www.diee.unica.it>

Abstract Deadline: 1 February 2000
Camera Ready Copy: 30 April 2000

Vision Geometry IX 30 - 31 July 2000, San Diego, USA

This conference is designed to bring together researchers who use geometric theory and techniques to solve problems related to computer vision.

Conference Chairs are:

L J Latecki, Hamburg Univesity, Germany; D M Mount, University of Maryland, College Park, USA; A Y Wu, American Univsesity, USA.

Topics of interest include but are not limited to:

Digital Images and Geometry

- digital geometry and topology
- approximations of curves and surfaces
- isosurface algorithms

Camera and Scene Geometry

- camera calibration
- multiview scene geometry
- geometric scene modeling

Object Geometry

- geometric object models
- geometric object recognition
- 3D object features

Computational Geometry

- complexity of algorithms, vision and image processing
- object recognition and point pattern matching
- convexity problems

Please submit abstracts via this web site:

<http://www.spie.org/web/meetings/calls/am00/confs/AM208.html>

Abstract Deadline: 10 February 2000
Camera Ready Copy: 3 July 2000

The Seventh IAPR Workshop on Machine Vision Applications 28 - 30 November 2000, Tokyo, Japan

The purpose of MVA2000 is to bring together researchers and practitioners from both academia and industry, and to exchange their knowledge and stimulate each other through intensive discussions on the following research topics

Algorithms, Architectures and Applications including:

- Factory Automation
- Intelligent Transport Systems
- Multimedia
- Medical
- Geographic Information System
- Human Computer Interaction
- Security

Please submit four copies (in English) extended abstract 500-1000 words with at least one main figure to:

Prof K Ikeuchi, Institute of Industrial Sciences, University of Tokyo, 7-2-1 Roppongi, Minato-ku, Tokyo 106-8558, Japan
<http://www.etl.go.jp/etl/gazo/mva2000/>

Abstract Deadline: 31 May 2000
Camera Ready Copy: 20 September 2000

**9th Discrete Geometry for Computing Imagery
13 - 15 December 2000 Uppsala, Sweden**

DGCI 2000, the 9th in a series of international conferences, will take place outside France for the first time. The meeting will offer internationally acclaimed invited speakers and the topics will include:

- Topology
- Geometrical Transfers
- Models for Discreet Geometry
- Visualisation
- Tilings & Patterns
- Surfaces & Volumes
- Shape Representation and Understanding

Please submit four copies of full papers in English to:
Ingela Nyström, Centre for Image Analysis, Uppsala University, Uppsala, Sweden.

ingela@cb.uu.se <http://www.cb.uu.se/~dgci2000>

Abstract Deadline: 28 April 2000
Camera Ready Copy: 1 September 2000

**2nd International Conference on Advances in
Pattern Recognition**

11 - 14 March 2001, Rio, Brazil

This conference is invitation based and there will be no open call for papers. The focus will be on applications and aims to bring together a small gathering of senior researchers to strengthen further research within the community. The meeting is also sponsored by the British Computer Society and the proceedings will be published in advance by Springer Verlag.

**Pattern Recognition Letters
Subscriptions 2000**

Pattern Recognition Letters will publish 14 Issues, Volume 21, in 2000. The discounted price for IAPR members is applicable to a bulk order with a minimum of 10 subscriptions.

Member Bulk Subscription Rate: NLG 375
available until 31 March 2000.

Contact:
Wilma van Wezenbeek
Senior Publishing Editor
Elsevier Science
Sara Burgerhartstraat 25
1055 KV Amsterdam
The Netherlands



w.wezenbeek@Elsevier.nl

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BARCELONA, SPAIN

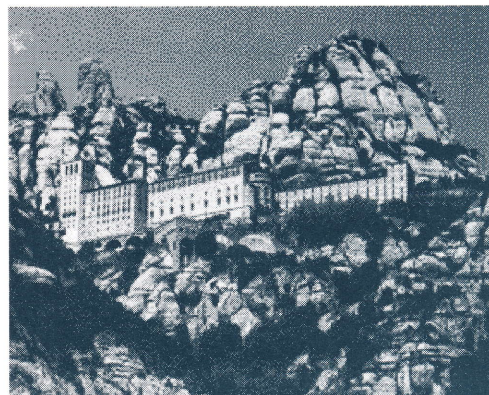
3-8 September 2000

DAY TRIPS FROM BARCELONA (CATALUNYA)

Despite Catalonia's small size (only 32,000 km), visitors will find amazing diversity, from miles of sea coast to the Pyrenean summits, from historical castles dotting the ancient medieval border to the modern pleasures of the big cities.

Catalonia offers a wide choice to holiday visitors from ski-slopes in the Pyrenees and rugged mountain scenery to the justly famous Mediterranean coast. There is the Costa Brava with its coves and breathtaking coastline. Day trips from Barcelona may include:

The Montserrat Monastery (shown below) is Catalonia's main draw, perched on one of the most unusual rock formations in Spain. Legend has it that this is the spot where Parsifal discovered the Holy Grail, and that a carving of the Virgin by St. Luke turned up here and could not be moved, necessitating the construction of a chapel on the spot to house the icon.



Pyrenees: Immediately beyond the region of Aragon, the Pyrenees reach the fertile land of Aran valley, crossed by the river Garona, which has its source in Spain, but flows through France. The valley has beautiful scenery with large lake areas, many watercourses and a series of mountain chains, which have over a hundred peaks creating a curious panorama. There La Bonaigua mountain pass is the only natural gateway to Spain.

Tossa de Mar (Costa Brava) offers a little bit of everything. It will be difficult for you to find a place such as this, which gathers in perfect harmony thick woods suitable for long walks, with pine trees by the seaside or hanging onto the cliffs, and quiet secluded beaches caressed by a transparent blue sea, with waves breaking against the rocks...

The Port Aventura: A fascinating thematic park which carries you to Mediterrània, Polynesia, China, Mexico and the Far West. A place to "fill all your senses with new experiences. Far away lands, brought close, just for you".



FORTHCOMING IAPR CONFERENCES WORKSHOPS AND EVENTS

Please check updated information on: <http://peipa.essex.ac.uk/iapr/>

2000	Event	Location	Deadlines	Contact
11-12 May RecPad 2000	11th Portuguese Conference on Pattern Recognition	Porto Portugal	Abstract Camera ready copy 17/12/1999 24/03/2000	Fax: +351 22 2087310 recpad2000@ineb.fe.up.pt http://ineb.fe.up.pt/recpad2000
21-23 June IWMCS 2000	First International Workshop on Multiple Classifier Systems	Cagliari Italy	Abstract Camera ready copy 01/02/2000 30/04/2000	Fax: +39 070 675 5900 rolf@dee.unica.it http://www.dlee.unica.it
30-31 July VGIX	SPIE's Vision Geometry IX	San Diego USA	Abstract Camera ready copy 10/02/2000 03/07/2000	Fax: +49 40 42838 5117 latecki@math.uni-hamburg.de http://www.math.uni-hamburg.de/home/latecki/
1 Sept PRRS	1st Int Workshop on Pattern Recognition in Remote Sensing	Andorra	Abstract Camera ready copy 31/03/2000 30/6/2000	Fax: +44 1483 34139 m.petro@ee.surrey.ac.uk http://www.ee.surrey.ac.uk/Personal/M.Petro/workshop.html
3-8 Sept 15 ICPR	15th International Conference on Pattern Recognition	Barcelona Spain	Abstract Camera ready copy 01/12/1999 14/04/2000	Fax: +34 93 325 27 08 icpr2000@cvc.uab.es http://www.cvc.uab.es/ICPR2000
28-30 Nov MVA2000	Seventh Workshop on Machine Vision Applications	Tokyo Japan	Abstract Camera ready copy 31/5/2000 20/9/2000	Fax: +81 3 3401 1433 ki@is.u-tokyo.ac.jp http://www.edl.go.jp/edl/gazo/mva2000/
13-15 Dec DGCI 2000	9 th Discrete Geometry for Computer Imagery	Uppsala Sweden	Abstract Camera ready copy 28/04/2000 01/09/2000	Fax: +46 18 55 34 47 dgcic2000@cb.uu.se http://www.cb.uu.se/~dgcic2000
2001	2001	2001	2001	2001
11-14 March ICAPP	International Conference on Advances in PR	Rio Brazil	Abstract Camera ready copy 15/03/2000 15/10/2000	Fax: +44 1392 264067 s.singh@exeter.ac.uk http://www.dcs.exeter.ac.uk/academics/sameer
13-15 June PRP-VII	Pattern Recognition in Practice	Vleiland Netherlands	Abstract Camera ready copy 01/11/2000 01/05/2001	Fax: +31 10 4089477 ppr@mi.fgg.eur.nl

The views presented in this newsletter represent the personal views of the authors of the respective articles and not of their host Institute nor IAPR