



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

Dear Everybody,

Why are people afraid of computers? Why do we have the data protection act and laws that make illegal, for example, to keep on a computer the data of students for more than 40 days? Why electronic data are considered different from paper files at the disposal of any organisation that may veto your application for a job or a loan, without giving you a reason? Why are we afraid of what one can do to us by storing our data in a computer? The world is teeming with examples of societies and regimes, which are nowhere near computerised, and yet they oppress their people with the help of files and archives stored in the vaults of secrete services and police departments, containing minute and insignificant pieces of information, ranging from a person's political views down to when he sneezed and who gave him the hanky! What is the difference between holding the data on a computer from holding them on paper? Why people blame the electronic mail

for misunderstandings that arise, on the grounds that it does not convey emotions via voice intonation and body language? Why an email is different from a letter on paper? People have been exchanging written messages, which lack the wealth of extra information contained in verbal communication, ever since writing was invented. And yet as far as I know letters have never been blamed for misunderstandings as an incomplete means of communication. Why do we need the emoticons (see p 5)? Frankly speaking, by the time I search the list of emoticons to use the right one to convey my feelings, I might as well read my message once more to make sure that it says what I wish to say!

I thought of a profound theory to answer all these questions! Every natural system has its own length, time and mass scales intrinsically determined. From these three basic units, we can determine all other units needed to measure the physical phenomena involving the system. For example, the size of the filter with which you can detect a line in an image must have some relevance to the width of the line, otherwise the line will be missed either as too thin or as too wide! The human body has its own speed-scale, determined by the size of the slice of space-time carved for it: this speed-scale can be quantified by the size of the Earth on which we live and our average life time. Using the perimeter length (40,000 km) for the former and 70 years for the latter, I make that the speed-scales of phenomena for which a human may feel at ease, must be measured in units of 65 m/hr, or 18 mm/sec. Isn't it remarkable that this is of the same order of magnitude as the speed with which messages are exchanged between neurons

in our brain? Anything that happens at significantly higher speeds must appear disturbing. So, what bothers us is perhaps the speed with which one can retrieve our data from a computer, and the speed with which our message can travel, rather than the knowledge that somebody holds information on us or that email does not convey feelings.

Taking these thoughts one step further, I can understand now why I could not kill that fly the other day: given that a fly lives 1 year instead of 70, its brain must work 70 times faster than mine! And can you imagine how immigrants to Jupiter will cope with Jupiter's mosquitoes which live on a planet 11 times bigger than ours! :-o :-o :-o (I looked it up; that is the emoticon for Uh oh, Uh oh, Uh oh!)

Maria Petrou

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New Editor Invited

Our editor Maria Petrou would like to give the opportunity of the newsletter editing to somebody else after doing her job for five years.

I am certainly not the only one who enjoyed her refreshing humour and clear view of PR topics in her editorials and other writings - so let me thank her for all this excellent enthusiastic unpaid long-term work for us.

Setting such a high standard Maria created problem for us where to find a corresponding replacement. We are now seeking a new editor who has good understanding of all the research topics under the IAPR umbrella, prepared to sacrifice some personal work on it, and is familiar with Latex.

Please send your applications or suggestions either to me or to other Publication Committee members.

Michal Haindl, Chairman of the Publicity Committee
haindl@utia.cas.cz

News for Members

New GB member for South Africa

Dr Allon W V Poole (Hermann Ohlthaver Institute for Aeronomy, Dept of Physics and Electronics, Rhodes University, Grahamstown 6140, Republic of South Africa, Tel: +27 461 318460, Fax: +27 461 25049, phap@giraffe.ru.ac.za, http://phlinux.ru.ac.za/HOIA) is the new chair of PRASA, and replaces Dr de Jager in the GB of IAPR.

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The Visible Human Dataset

In 1993, the US National Library of Medicine funded a team of researchers to produce thousands of razor-thin slices of two cadavers which were photographed, capturing detailed images of the structures in the body. These computer image sets, one of a 39-year old convicted murderer and one of a 59-year-old woman who died of a heart attack are now mirrored at Glasgow University, UK too, for use in medical education and research. The images include CAT scans, MRI and cryosection images and are available free of charge to researchers who sign the NLM's licence agreement. The Visible Human UK Mailbase list will provide further information. Instructions on how to join can be found at <http://www.mailbase.ac.uk/lists/visible-human-uk/join.html> and for information about access to the Visible Human Dataset, see the mirror site at <http://vhp.gla.ac.uk/> or contact Christine Parker-Jones at cpj@psychology.leeds.ac.uk, Tel: +44 113 233 5729, Fax: +44 113 233 5749.

Journal COMPUTING

Special issue on Digital Image Processing

Topics: *Image Databases and Video Libraries, Wavelets and other Basis functions for Image Analysis, Parallel Methods in Image Processing, Robust Methods for Computer Vision, Learning and Adaptive Methods in Computer Vision, Information/Sensor Fusion, Motion and Navigation, 3D-Vision.*

Submit 3 copies of a 20-page paper (12pt, double spacing) by June 1st 1998 to W G Kropatsch, (COMPUTING, Devoted Issue), Institute for Automation 183/2, Pattern Recognition and Image Processing, Vienna University of Technology, Treitlstr. 3/1832, A-1040 Wien, Austria. (krw@prip.tuwien.ac.at). More information at <http://www.springer.at/springer.py?Page=40&Key=172&cat=3&id.journal=8>.

Journal MACHINE GRAPHICS & VISION

Special issue on Medical image analysis

The papers must concern the backgrounds and methods of image analysis and computer graphics in medical diagnosis, therapy monitoring and medical education. The papers must be submitted to the address below, before June 30, 1998 and must satisfy the general editorial requirements of the journal. W Mokrzycki, Inst of Comp Sciences, Polish Academy of Sciences, 21 Ordonia St, 1-237 Warsaw, Poland. (wokrzycc@ipipan.waw.pl)

Photogrammetry: an overview

What are photogrammetric techniques? Do they have any relevance to those in the Computer Vision area? What are their strengths and weaknesses? Where can I get more information? These are the questions this short article is attempting to answer. The most important aspects of photogrammetry are: geometric modelling of the image formation process; the use of high precision methods of image location; redundancy of image measurements and least squares estimation to compute modelling parameters, eg both 3-D and camera (external and internal) parameters.

Historically topographic mapping has been an important photogrammetry area and still is today. Normal case aerial photography is often used and special purpose equipment allows an operator to produce contour maps and digital terrain models. Similar techniques can also be applied to produce: architectural models of buildings or facades, archaeology surveys, or human body scans eg for back problem analysis. Photogrammetry is probably at its most sophisticated when a number of convergent views of an object are used. In this case self-calibration is possible and 3-D measurement of multiple points can take place either simultaneously or sequentially using a single camera. Examples are missile or plane tracking, antenna measurement and verification of the design of manufactured structures. One way to review photogrammetry is to analyse the individual techniques which are used, such as:

- Point location techniques: to compute the location of images of targets or patches to subpixel accuracy.
- Least squares patch matching: matching patches between images using geometric and radiometric constraints.
- Resection: locating the cameras with respect to the environment.
- Intersection: computation of 3-D co-ordinates after correspondence using collinearity equations.
- DLT: fast 3-D computation using least squares and some lens modelling.
- Bundle Adjustment: use of redundant measurements and least squares to estimate 3-D and other parameters simultaneously.
- Self-calibration: use of the bundle adjustment to estimate camera internal parameters only.
- Epipolar constraints: solution of the correspondence problem.
- Rectification: to ease computations required in the correspondence process.
- Multi-media: modelling of imaging through media with different refractive indices.

What are the key characteristics of photogrammetry? Photogrammetry is almost always strongly linked with practical applications usually with a requirement for results which can be verified by some indications of data quality based on statistical analysis. Least squares techniques are normally used to estimate parameters and provide statistics about the measurement process. Supplementary information like that obtained from measurements in the object space is also incorporated. Errors estimated are propagated where appropriate. High precision results are obtained using CCD cameras ranging from 1:10,000 to 1:150,000 of the largest dimension of the object being measured.

In conclusion, in addition to what has been discussed, a large number of techniques familiar to those in the computer vision community are also used by photogrammetrists in applications as wide as robotics, microscopy, virtual reality, tracking road vehicles, and aircraft manufacturing. If any of the topics mentioned is of interest then the photogrammetric literature will provide a rich source of material.

Some key sources are:

Books:

1. Close Range Photogrammetry and Machine Vision, 1996. Edited by K.B. Atkinson. Published by Whittles Publishing, Roseleigh House, Latheronwheel, Caithness, Scotland, KW5 6DW. 371 Pages. ISBN 1-870325-46-X
2. Manual of Photogrammetry, 1980. Edited by C C Slama (4th Edition). American Society for Photogrammetry, Falls Church, Virginia, 1056 pages.

Journals:

1. Photogrammetric Record. Editor K B Atkinson. The Photogrammetric Record, Department of Geomatic Engineering, University College London, Gower Street, London, WC1E 6BT. ISSN 0031-868X
2. Photogrammetry and Remote Sensing. Editor D A Tait. Published by Elsevier Science, B V Molenwerf 1, PO Box 211, 1000 AE Amsterdam. The Netherlands. ISSN 0924-2716.
3. Photogrammetric Engineering and Remote Sensing. American Society for Photogrammetry & Remote Sensing 5410 Grosvenor Lane, Suite 210, Bethesda, Maryland 20814-2160.

Conferences:

1. ISPRS Commission V proceedings (1908–1996). International Archives of Photogrammetry & Remote Sensing, RICS Books, Surveyor Court, Westwood Way, Coventry, CV4 8JE, UK.
2. Optical 3-D Measurement techniques (1–4). Edited by A Gruen & H Kahmen, Published by H Wichmann Verlag, Huthig GmbH, Heidelberg.
3. Videometrics (1–5) Edited by S F El-Hakim. Published by SPIE. Po Box 10, Bellingham, Washington 98227-0010, USA.

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Image Processing and Optic Technology 1998 (IPOT'98)

February 9-13, 1998

The impressions of a browser...

The National Exhibition Centre, Birmingham, UK hosted a comprehensive show bringing under one roof a wide variety of products related to image processing, machine vision, lasers and optics. Conventional technologies were exhibited alongside advanced technologies, and time-proven products were marketed in competition with novel products which may become state-of-the-art in a few years. In this short report I shall take you through some of the stands at IPOT'98 and highlight some products which particularly attracted my attention.

Choosing the correct **lighting** for your application can spell out project failure or success in terms of both feasibility and viability. At IPOT'98 I visited a number of suppliers providing a range of products to serve lighting needs. On the stand of Lake Image Systems Ltd, Advanced Illumination displayed a range of LED lighting products including diffuse back-lighting, LED light sources designed to give specific luminous intensities at specified distances, and light sources providing optimal illumination angles for specific applications. Special Application Products Ltd, UK distributors of Stocker & Yale illumination products, displayed fluorescent ring lights and fibre optic light sources useful for providing illumination at awkward locations. A particularly impressive system, called the Continuous Diffuse Illuminator (CDI) by Northeast Robotics, was exhibited on the stand of Vortex Vision Ltd. The CDI is quoted by Vortex Vision as being an ultra high performance diffuse illuminator useful in imaging objects with complex reflective surfaces. The CDI was used in a demonstration where a bar-code printed on a reflective packet was imaged without any highlights. Laser 2000 (UK) Ltd exhibited laser light sources providing different light structures with well-defined luminosity profiles; these structured lightings include cross-lines, square meshes and concentric circles and provide a useful tool to the vision specialist.

The camera is a central device in machine vision and IPOT'98 brought together several camera suppliers offering a wide range of specifications. A particularly new development was the introduction of the '**intelligent**' camera. In effect, this is a system which houses the camera and a programmable electronic system with the capability of producing a pass/fail output for a visual input. Perhaps limited in flexibility and rather more difficult to programme, the intelligent camera may provide a cheaper alternative to host-based systems consisting of a separate camera, frame-grabber and computer. The emerging intelligent cameras may only be seeing grey at the moment, but their chromatic cousins may be with us in less than a year. Optimum Vision Ltd delivered a brief seminar on the emerging intelligent camera and Siemens Automation exhibited their SIMATIC VS 710 digital intelligent camera.

Closely related to the camera are its external optics; as I walked past the stand of Melles Griot Ltd I saw a demo of a **telecentric lens** - a lens with a very small change in view-

ing angle between the centre of the field and its edge. This is a useful property for automatic visual inspection and measurement as was shown in this demo where an array of holes were being imaged perpendicularly from above by a conventional lens and a telecentric lens; the former lens also imaged the side-walls of the holes at the edge of the array, whereas the latter lens only imaged the plan view of the array with no side-views thus demonstrating the superiority of this lens for inspection and measurement purposes.

For relatively simple vision inspection problems, a number of different suppliers are providing **software packages** which facilitate system prototyping and run-time implementation. Neurocheck is a Windows-based package by Data Translation Ltd which allows the user to put together image processing tools available from a menu thus building up one's own inspection routine without the need to go into any programming at all. By setting up an appropriate camera, lighting and image grabber on a computer running an inspection routine which was put together by this application development software, it is much easier to go from vision system inception to implementation.

The wide variety of products on show simply goes on and on, to the extent that one may be spoiled for choice yet still uncertain of the best solution for one's own application. There again IPOT'98 featured a stand by Sira Technology Centre offering an Internet **on-line information service** to help those who are trying to figure out the best imaging solution. This on-line service at www.siraonline.co.uk was announced to be going on-line this April and will be free of charge till the end of the year.

*Kenneth P Camilleri
University of Malta*

PATTERN RECOGNITION LETTERS

An official publication of IAPR

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The 1998 issue is Volume 19 and consists of 14 issues. For an application form and more details, please contact your nearest regional sales office:

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The era when words are not enough! EMOTICONS

When you write an e-mail or something like that, the words that you write do not always convey the full meaning of your message. The reason for this is that emotions are not transmitted. This is where emoticons come in and solve the problem! Yes, today's fast-track young have come up with an ingenious way to convey feelings and emotions with plain ASCII characters. Here are a few emoticons you might like to use yourself!

:-) Used to inflect a sarcastic or joking statement.

:-(User did not like that last statement.

:~I Indifferent reaction to a statement.

:*) User is drunk.

[:] User is a robot.

:-* User just ate something sour.

:~) User drools.

:~) User has a cold.

:~-(User is crying.

:~-) User is so happy, s/he is crying.

:-@ User is screaming.

:-& User is tongue tied.

|~I User is asleep.

|~O User is yawning/snoring.

O ~-) User is an angel (at heart, at least).

:-D User is laughing (at you!)

:-/ User is sceptical.

C=:~) User is a chef.

@= User is pro-nuclear war.

:~o Uh oh!

:~9 User is licking his/her lips.

%~6 User is brain-dead.

[:-) User is wearing a walk-man.

:~0 No Yelling! (Quiet Lab)

,-) Ditto...but he's winking.

=) Variation on a theme...

:) Happy.

:¿ What?

:@ What?

:D Laughter.

:I Hmm...

:(Sad.

:[Real Downer.

:O Yelling.

:,(Crying.

:* Kisses.

:~) ha ha

|~) hee hee

|~D ho ho

:~¿ hey hey

:~-(boo hoo

:~I Hmm

:~O oops..

:~P nyahhhh!

I hope you found the list both educational and funny!

Costas A Palmer,
Guildford County School

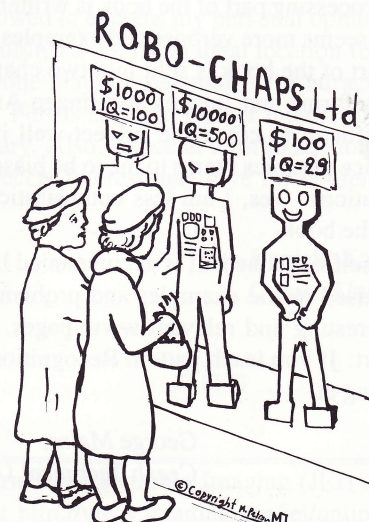
Performance Evaluation: A special issue of Machine Vision & Applications Vol 9, Number 5/6, 1997

Last year ECVnet organised a workshop on performance evaluation at ECCV and the special issue of Machine Vision Applications that resulted from it contains 10 out of the 18 papers submitted. The issue contains an excellent editorial, written by Christensen and Forstner, which offers a very comprehensive overview of the topic. It presents in a very systematic way the list of commonly quoted objections to performance characterisation, as well as the types of approaches used to achieve it. The objections raised to performance characterisation are reminiscent of the objections against IQ tests: "What is intelligence? Unless you can answer this first, how can you measure it?" - "What is the task? Unless you define it, how can you evaluate the algorithm?" However, we are not trying to evaluate the *cognitive* ability of robots/computers; we evaluate algorithms (ie modules of cognitive systems) in terms of what they are set out to do. For example, if you are evaluating an edge detection algorithm, which has been designed to identify sudden changes of brightness in an image, it is silly to penalise it for not discriminating between shadow boundaries and genuine object boundaries. And that is the key issue that allows the development of systematic methodology for the evaluation of a great variety of algorithms, ranging from edge and line detection to 3D pose estimation. We have at our disposal very powerful tools: algebra, statistics and simulation. We can use them to evaluate modules against their objectives, which should be well defined. This special issue bears witness to that as it includes representative examples of the use of all available approaches: protocols for evaluating edge and line detection algorithms, a study for the behaviour of a texture perception algorithm, as well as evaluation studies of several aspects of robotic vision relying on the solution of algebraic equations.

For more information on performance evaluation, one can look at <http://pandora.imag.fr/ecvnet/benchmarking.html>

Maria Petrou

WINDOW SHOPPING IN THE 21st CENTURY



-I only want it to take the rubbish out in the evening...

BOOK REVIEWS

Pattern Recognition and Image analysis, by *Earl Gose, Richard Johnsonbaugh and Steve Jost*, Prentice Hall, ISBN 0-13-236415-8

By coincidence I was asked to review 'Pattern Recognition and Image Analysis' at the time when I was preparing a pattern recognition course for master students at the Czech Technical University in Prague. I had the classics on my desk: Pattern Recognition by Devijver and Kittler, Introduction to Statistical PR by Fukunaga, Pattern Classification and Scene Analysis by Duda and Hart as well as some newer books on the subject: Handbook of PR and CV by Chen and Pattern Recognition Engineering by Nadler.

Naturally the first question I asked myself was: 'Is there any room for the newcomer in this crowded space?'. In my opinion, the answer is a definite yes, simply because 'Pattern Recognition and Images Analysis' presents the subject-matter very differently. Its style follows the strategy of teaching by examples. A brief introduction of a concept or problem is immediately followed by a worked example(s). The text is accompanied by many figures, making the book user-friendly.

In the preface the authors state that the book is intended for 'upper-level undergraduate and beginning graduate courses'. Maybe that for the 'top-of-the-range' students a more formal approach relying on sophisticated maths would allow faster and deeper understanding of the subject; but I believe that for most students the friendly style of PR and IP is preferable. This is especially true for students specialising in eg biology who might like to get a feeling what PR is about without necessarily going into details. In any case, if a formal approach is wanted, there is plenty of choice.

With respect to the content there are no surprises. The Pattern Recognition part of the book comprises of four chapters. The chapter titles show that the book covers the accepted core of the field: Statistical Decision Making, Learning etc; Non-parametric Decision Making; Clustering; Artificial Neural Networks.

The Image processing part of the book is written in a similar style. But it seems more verbose and examples are harder to find. This part of the book is split into two chapters: Processing of Waveforms and Images and Image Analysis. It seems to me difficult to cover the subject well in 150 odd pages. The choice of topics seems to me to be biased towards medical applications. Yes, I am less enthusiastic about the second part of the book.

The book is self contained. It is accompanied by a floppy with a dataset used in the examples and problems. It lists pointers to interesting and relevant www pages. It is well written. In short: If you teach pattern Recognition I believe it's worth looking at.

*George Matas,
Czech Technical University*

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Choquet-Deny Type Functional Equations with Applications to Stochastic Models, by *R Rao and D N Shanbhag*, John Wiley & Sons, ISBN 0 471 95104 8

In world religions it is common to use many names for one god in order to understand better what god is. The more important the god is the more names he has.

In Probability Theory the main object is distribution of a random variable. Theoretically the essence of a distribution is expressed by its definition. To understand better what the distribution is we may not be contented with the standard definition and we may want to have some other equivalent ones. The more important the distribution is the more definitions of it we would like to have.

In the bibliography of the book about 500 papers published during the last 30 years are listed. These papers concern characterisation of probability distributions and stochastic processes. The typical headers of the papers are "On characterisation of exponential and gamma distributions", "Some characterisation...", "Another characterisation". In general, "characterisation" means an offer of an equivalent definition.

Enormous number of such definitions and theorems have been produced and the book can be considered as a guide through this area. The problem is that it seems that there was no one general idea to unify the proofs of the theorems so it is difficult to say that the characterisation theorems together constitute a theory.

The authors improved many of the theorems – statements and proofs. But the main purpose of the book was to present a single approach to the characterisation problem. So the book can be split into two parts: (1) the tool that they present to unify the characterisation theorems area (approximately 1/3 of the book) and (2) characterisation theory.

Let us consider the tool they propose. It is worth looking through some simple results. They started 30 years ago with investigation of problems like this: Let

$$v_m = \sum_{n=0}^{\infty} v_{m+n} w_n \quad \text{for } m = 0, 1, 2, \dots$$

Then if these numbers are non-negative and under some plausible assumptions, we have that $v_n = v_0 b^n$ for some b . For the continuous analogue we may expect something like $H(x) = \int_0^{\infty} H(x+y)w(y)dy$ implies $H(x) = \exp(-x)$. In reality it is not exactly like this, but something like this. It is possible to consider these problems for every mathematical structure where it makes sense to summarise or integrate and call it "Choquet-Deny convolution equation". (However, in my opinion it is only a natural extension of an old problem $y' = y$). And the authors did it in the first 1/3 of their book presenting very many versions and extensions of this simple result. However, they kept in mind that the results and the whole pattern of the first part of the book would be used as a background for the second part.

Reading the book it is not easy to agree that the technique developed in the first part is massively used in the second. It rather gives a logical way to present the extensive information.

*A Kadyrov,
Penza State University, Russia*

Advances in Computer Vision, by *F Solina, W G Kropatsch, R Klette, R Bajcsy (Eds)*, 1997. VIII, 266 pp 96 figs, ISBN 3-211-83022-7 (Table of contents available under: <http://www.springer.de/catalog/html-files/deutsch/comp/toc/3211830227-c.html>)

The book contains the proceedings of a workshop on theoretical foundations of computer vision held in 1996 in Germany. It is a collection of 26 selected papers (10 pages/paper) of a very broad variety. The sheer range of topics covered and the amount of background knowledge needed to appreciate the contributions makes it impossible for me to give a fair judgement of all the papers in this volume. To give the reader an impression of the range of topics covered in these papers I compiled the following (incomplete) list of the subjects:

Partial differential equations (PDE) and anisotropic scale space, topology and morphology, watersheds, graph networks, associative memory and neural networks, minimum-description-length for sensory data, Hough transforms, Markov- and non-Markov Gibbs models, image pyramids, active colour illumination for dense depth maps, integration of discrete vector fields for shape estimation, complete integrals and envelopes for shape from shading, structure from motion and Kalman filtering, regular languages, 3-D object recognition of planar and CAD-based objects, quaternions for hand-eye calibration, signal to symbol transforms for navigation of mobile robots and finally geometric algebra.

What you find interesting or useful in such a collection depends of course on your interests:

If you have a background in mathematics you may browse the volume and check how you can apply your long-forgotten topology, algebra and PDE-courses to investigate computer vision problems. If you are an engineer you may be interested in colour based range imaging or pyramids.

Summarising I guess that a typical participant of the workshop (or a reader of this book) is either frustrated (since he has no idea what it is all about) or that he is appreciating the opportunity to come into contact with unknown, interesting and perhaps even useful new aspects of computer vision.

Finally it should be mentioned that one of the goals of the workshop was to bring together researchers from western and eastern European countries. The differences in background, style, approach, culture and contents between these two groups are clearly visible and they show that both groups can (if they want) learn a lot from each other.

Reiner Lenz,
Linköping University, Sweden

"By the end of the Millennium, over 20 terabits of data - roughly the equivalent of 600,000 Bibles - will be generated every day by Earth observation satellites."

From a speech delivered by Mr Battle, Industry minister of the UK, at a British Space Centre meeting, November 1997.

CONFERENCE REPORTS

Computer Analysis of Images and Patterns September 10-12, 1997 Kiel, Germany

This was the 7th CAIP, the 1st being in East Berlin in 1985. Today, there exist many regional conferences on image analysis and computer vision including SCIA, ECCV, CVPR, and ACCV. Each is based on a particular region although participation is not limited to it. The base region of CAIP has traditionally been central and eastern Europe. This time, 23% of the participants and 27% of the papers came from central and eastern Europe.

A region-based international conference serves the purpose of providing an opportunity for academic interactions within the region. However, this function is not successful if participation is only limited to that region because of the rapid scientific progress worldwide. The success of a region-based conference depends heavily on how many participants it can attract from other regions. CAIP'97 was very successful in this respect: there were many participants from Scandinavia and western Europe and some from the USA and Asia. This fact qualifies CAIP'97 as a truly first-class international conference rather than a mere local meeting.

Such global participation is partly due to the fact that today a lot of collaboration is taking place between different countries and researchers are frequently moving across borders. But another factor existed for CAIP'97: an international workshop AFPAC'97 (Algebraic Frames of Perception-Action Cycle) was held at the same site just before CAIP'97, and a lot of prominent scientists were invited to it worldwide. Perhaps these two factors are the main reason for the many presentations of subjects related to both geometric and algebraic invariance. This distinguishes CAIP'97 from all other region-based international conferences. We should also not forget about the good management of both conferences by the organiser Professor Gerald Sommer, which no doubt contributed to the success of CAIP'97 enormously.

The next CAIP is scheduled to be held in Ljubljana, Slovenia in 1999 (organisers: Franc Solina and Ales Leonardis). If I am allowed to express my personal opinion, I have some advice. Ljubljana seems an ideal location for CAIP, but the location alone may not be enough for attracting global participation. For its success, further international interactions are necessary. Also, a special tutorial session on a particular theme of recent interest may give the conference additional attraction.

Kenichi Kanatani,
Gunma University, Japan

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The Journal of Electronic Imaging (JEI) can be viewed online at <http://www.imaging.org/jei/online.html>, accessible only by subscription and authorized password.

Soft Comp'98

January 12-13, 1998 Calcutta, India

The schedule of the two day lecture sessions of this meeting was very tight. It was divided into various sessions comprising nine intensive lectures (each of duration 1 hour and 45 minutes) on different aspects of soft computing. The first day's program started with the theme lecture by Professor S K Pal. He described what soft computing is, and emphasised the relevance of various soft computing tools (eg, fuzzy sets, neural networks, genetic algorithms etc). This was followed by the lecture of Professor V Di Gesu, University of Palermo, Italy, who talked extensively about the utility of fuzzy set theory and described the fuzzy versions of morphological operations in this regard. Professor B Yegnanarayana, Indian Institute of Technology, Chennai, gave an extensive coverage on the fundamental aspects of different artificial neural networks and Boltzmann Machines. Dr K Deb of the Indian Institute of Technology, Kanpur talked on Genetic algorithms and on hybridization of genetic algorithms with fuzzy systems and neural systems for making them artificially more intelligent.

Professor J Bhattacharya, Indian association for the Cultivation of Sciences, spoke on "Chaos in Nonlinear Dynamics and its Applications". Dr S Mitra of the Indian Statistical Institute described the utility of integrating neural networks and fuzzy set theory (eg neuro-fuzzy and rough-fuzzy-network systems) for pattern classification, rule generation and inferring with many real life applications to speech recognition, fingerprint analysis, and medical diagnosis problems. She also illustrated the use of Rough set theory for efficient knowledge encoding in neural networks. The lecture following her's was by Professor D Dutta Majumdar of Indian Statistical Institute who talked about uncertainty management in soft computing with applications to Magnetic Resonance Imagery. Finally, future trends of computer communication within the theme of the workshop were highlighted by Professor S Noguchi, from the University of Aizu, Japan.

The workshop was attended by about one hundred participants mainly from various parts of India. They were having different backgrounds ranging from graduate engineer, University professor, personnel from R & D organisations to divisional managers of companies. Many funding agencies including industries came forward to sponsor partially this international meeting in order to make it a success.

Sankar K. Pal, Indian Statistical Institute

CONFERENCE ANNOUNCEMENTS**BMVC'98****British Machine Vision Conference**
September 14-17, 1998 Southampton, UK

Topics: *image processing and feature extraction, practical applications, object recognition and scene analysis, model-based coding, 3D shape reconstruction, architectures, computational issues in perception, active vision, robotic vision and sensory fusion, motion analysis, advanced pattern analysis, neural networks, vision-based biometrics, early vision.*

Submit 4 copies of a no more than 10 pages paper (approximately 5000 words if there are no figures), to the address on p 10. Electronic submissions also accepted.

Deadline for paper submission 1 May, 1998
Deadline for camera ready copy 10 July, 1998

PRIP'99[IAPR]**Fifth International Conference on
Pattern Recognition and Information
Processing**

May 18-20, 1999 Minsk, Belarus

The conference will focus on both theory and applications. It is organized by the Belarusian State University of Informatics and Radioelectronics, (Belarus) and the Technical University of Szczecin, Institute of Computer Science & Information Systems (Poland).

Topics: *Pattern Recognition, Image Analysis, Signal Processing, Systems and Parallel Architectures for Signal and Image, Processing, Knowledge - Based Expert and Decision Support System, Application of Pattern Recognition and Image Analysis, 3D image Processing and Modelling, etc.*

Working languages of the Conference are English and Russian.

Send 3 camera ready copies of a 5 A4 pages paper to the address on p 10. The text should be printed within 240 × 165 mm area in one column by 1.5 space and 12 point font. The first page should include the title, author's name(s), complete mail and e-mail addresses, fax number. It should be centered and the title should be bolded and capitalized. A blank line is required between the title and the author's name(s), and between the author's name(s) and his/her complete address. The abstract must not exceed 100 words, and up to 6 keywords must be used. The headings should be centered and bolded. Leave space of two lines above and one line below these headings. All paragraphs should have a five space indentation. Also submit a 3.5" diskette with the paper in Microsoft Word, Word Perfect or LaTeX.

Deadline for paper submission 15 November, 1998

PRP-VI[IAPR]**Pattern Recognition in Practice VI**

June 2-4, 1999 Vlieland, The Netherlands

Chairmen: E S Gelsema and L N Kanal. Program Committee: T M Caelli, R P W Duin, E S Gelsema, A K Jain, L N Kanal and P Smyth. Participation is limited to about 60 persons.

Topics: *Statistical Pattern Recognition, Subspace Approaches, Graphical Modelling, Probabilistic Reasoning, Neural Networks, Machine Learning, Use of Models in Image Processing, Innovative Applications, Practical Recognition Systems, Performance Evaluation.* Send an extended abstract to the address on p 10.

Deadline for paper submission 1 May, 1999

**CAIP'99 [IAPR]
8th International Conference on
Computer Analysis of
Images and Patterns**

September 1-3, 1999 Ljubljana, Slovenia

The CAIP conference is a traditional Central European Conference devoted to all aspects of computer vision, image analysis, pattern recognition and related fields.

The conference is sponsored by IAPR, the Slovenian Pattern Recognition Society and the IEEE Slovenia Section. The conference will be held in Ljubljana, the capital of Slovenia. The city, which is a lively mixture of Mediterranean and northern influences, offers all amenities within short distance. Alpine resorts, the Adriatic coast and several spas are close to Ljubljana.

The scientific program of the conference will consist of plenary lectures by invited speakers, contributed papers presented in two parallel sessions and posters. The CAIP proceedings are published by Springer Verlag in the series Lecture Notes on Computer Science and will be distributed to the participants at the conference.

Topics: *Image Analysis, Computer Vision, Pattern Recognition, Medical imaging, Network Centric Vision, Augmented Reality, Image and Video Indexing, Industrial Applications.*

Submit 5 copies of a no more than 10-page paper (excluding title pages) to the address on p 10. To enable double blind review make two title pages. The first with title, author's name, affiliation and address, telephone, fax and e-mail, abstract of 200 words and up to three keywords. The second title page should consist only of title, abstract and keywords.

Deadline for paper submission 15 January, 1999

**ICVS '99
International Conference on
Vision Systems**

January 13-15, 1999 Gran Canaria, Spain

Topics: *System architectures, Methods for system synthesis and verification, Active Vision systems, Control of perception and attention, Knowledge/system representation, Multi-Agent systems and coordination, Context modeling, Cue integration, Prototype systems, Performance characterization & benchmarking.*

Submit 4 copies of an up to 20-page paper to the address on p 10. Use 11pt and double spacing.

Deadline for paper submission 30 May, 1998

Deadline for camera ready copy 30 Sept, 1998

**SCIA'99 [IAPR]
11th Scandinavian Conference on
Image Analysis**

June 4-6, 1999 Kangerlussuaq, Greenland

The conference venue is Kangerlussuaq Conference Centre, which is conveniently located near the main airport in Greenland. In addition to SCIA'99, there are plans for a workshop/tutorial on *Statistical Image Analysis* on June 4-6, 1999. Because of the location, transport is arranged via Copenhagen by Greenland Travel and technically the whole arrangement is considered as a package tour. The price (from Copenhagen) including proceedings, flight, hotel (shared double rooms without ensuite bathroom) and all meals (but not drinks) is expected to be around DKK 12,000. In connection with ordering the package, there will be a possibility to get favorably priced tickets for connecting flights from your country to Copenhagen. Also hotels in Copenhagen can be arranged. As an example a connecting flight from Bergen in Norway to Copenhagen is expected to be around DKK

Topics: *Image analysis, Industrial applications, Computer vision, Multimedia, Pattern recognition, Biomedical applications, Neural networks, Remote sensing, Statistical Methods, Future technologies.*

Send three copies of a paper no longer than 8 book pages, to the address on p 10. The cover page must contain title, full contact information of the authors, a 150-200 word abstract, 3-5 keywords, and state choice for presentation (oral or poster). All pages should show the name of the first author. Style file by anonymous ftp from ftp.diku.dk in /pub/scia99.

Deadline for paper submission 2 November, 1998

Deadline for camera ready copy 1 March, 1999

**ISPACS'98
1998 IEEE International Workshop on
Intelligent Signal Processing
and Communication Systems**

November 4-6, 1998, Melbourne, Australia

Topics: *Neural and Fuzzy Logic Processing, Radio Propagation and Channel Modelling, Digital Signal Processing, Neural Network and Fuzzy Logic Applications for Communications, Adaptive and Nonlinear Processing, Video, Audio Coding and Standards, Video Compression and Communications, Multimedia Signal Processing and Communications, Optical Signal Processing, Signal Processing in Mobile and Personal Communications, Signal Processing in Radar and Antennas, Intelligent Signal Processing, Security Signal Processing, Programmable DSP in Communications, VLSI/ASIC for Intelligent Signal Processing, etc.*

Submit 3 copies of a 5-page paper in camera-ready form to the address on p 10. Use 10pt font with A4 size paper, 2.5cm margin around and 2-columns with 0.6cm in between.

Deadline for camera ready copy 6 June, 1998

FORTHCOMING CONFERENCES, WORKSHOPS AND EVENTS

1998	Event	Location	Contact
26-29 May QW'98	Software Quality Methodologies	San Francisco California	R Bral, SR/Institute, Inc, 625 Third Street, San Francisco, CA 94107-1997 USA. Tel: +1 415 9571441, Fax: +1 415 9570730, qw@soft.com, http://www.soft.com/QualWeek/QW98
2-6 June ECCV'98	Computer Vision	Freiburg Germany	H Burkhardt, Comp Sci Dpt, Freiburg Univ, Am Flughafen 17, D79085 Freiburg, Germany. eccv98@informatik.uni-freiburg.de, http://www.informatik.uni-freiburg.de/eccv98
6 June FIART	Facial Image	Freiburg Germany	M Tistarelli, DIST-University of Genova, via Opera Pia 13, 16145 Genova, Italy. Tel/Fax: +39 10 353 2805/2154 http://www.dist.unige.it/eccv98/
7-12 June HBM98	Functional Mapping of Human Brain	Montreal Canada	HBM98, Conf Office, McGill Univ, 550 Sherbrooke Str West, West Tower, Suite 490, Montreal QC Canada, H3A 1B9. Tel: +1 514 398 3770, HBM98@ums1.lan.mcgill.ca, Fax: +1 514 398 4854, http://www.bic.mni.mcgill.ca/hbm98/
18-20 June VI98	Computer Vision	Vancouver Canada	M Cheriet, Dept de Genie de la Production Automatisee, Ecole de Technologie Superieure, 1100, rue Notre-Dame Ouest, Montreal, Canada H3C 1K3. Tel/Fax: +1 514 3968972/595, cheriet@gpa.etsmtl.ca, http://www.etsmtl.ca/VI98
22 June IVM	Visual Motion	St Barbara California	A Bobick, MIT Media Lab, 20 Ames St, Cambrdige, MA02139, USA. Tel: +1 617 253 8307, Fax: +1 617 253 8874, bobick@media.mit.edu, http://www.media.mit.edu/bobick
26 June POCV	Perceptual Organization Comp Vision	St Barbara California	S Sarkar, Comp Sci & Eng, 4202 E Fowler Ave, ENB 118, Univ of South Florida Tampa FL 33620 USA. sarkar@csee.usf.edu, Tel:+1813 9742113 http://marathon.csee.usf.edu/sarkar/pocv.html
26 June PMA	Perception of Mobile Agents	St Barbara California	G Dudek, Centre for Intelligent Machines, McGill Univ, 3480 Univ Street, Montreal, Quebec, Canada H3A 2A7. http://www.cim.mcgill.ca/dudek/mobile/mobilevision.html
26-27 June WBIA	Biomedical Image	St Barbara California	B C Vemuri, Dept of CISE, CSE-324, Univ of Florida, Gainesville, FL 32611, USA. Tel: +1 352 392 1239, http://www.cs.ucsb.edu/cvpr98 , malladi@euphrates.lbl.gov
1-3 July NMBIA98	Image Analysis	Glasgow Scotland	NMBIA98, Signal Processing Division, Dept of Elec Eng, Univ of Strathclyde, 204 George Street, Glasgow G1 1XW, UK. http://www.spd.eee.strath.ac.uk/noblesse/nmbia98
6-7 July MIUA	Medical Image	Leeds UK	E Berry, Medical Physics, Wellcome Wing, Leeds General Infirmary, Leeds, LS1 3EX, UK. miua98@medphysics.leeds.ac.uk, http://www.miua.org.uk/
12-16 July SCI'98	Cybernetics & Informatics	Florida	N Callaos, IIIS, 6220 S Orange Blossom Trail, Suite 173, Orlando FL 32809, USA. Fax:+1407 8566274, WMSCI98@aol.com nacallao@telcel.net.ve, http://www.iiis.org
19-24 July SPIE	NN & Fuzzy	San Diego California	http://www.spie.org/info/sd/
4-7 Aug ICIPS'98	Intelligent Processing Systems	Gold Coast Australia	Z Q Liu, Dept of Comp Science, Univ of Melbourne, Parkville, Victoria 3052 Australia. zliu@cs.mu.oz.au Tel:+613 92879124, http://www.cit.gu.edu.au/conferences/icips98/ Fax:+613 93481184 http://www.cs.mu.oz.au/conferences/icips98
13-14 Aug MINAR'98	Multimedia	Hong Kong	H H S Ip, Dept of Computer Science, City Univ of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, cship@cityu.edu.hk, Fax: +852 2788-8614, http://www.cse.cuhk.edu.hk/minar98
17-20 Aug ICPR'98	Pattern Recognition	Brisbane Australia	14 ICPR'98, Conventions Queensland, PO Box 4044, St Lucia, South Queensland 4067 Australia. Tel:+617 38708831 Fax: +61 7 3371 9514, icpr14@convqld.org.au
26-28 Aug BASYS'98	Automation in Manufacturing	Prague Czech Republic	L Camarinha-Matos, Univ Nova de Lisboa, Quinta da Torre, 2825 Monte Caparica, Portugal. cam@uninova.pt, Tel:+3511 13500224 Fax: +351 1 2941253/8532, http://blanice.felk.cvut.cz/Basys

FORTHCOMING CONFERENCES, WORKSHOPS AND EVENTS

1998	Event	Location	Contact
31 A-4 S IFIP	World Computer Congress	Vienna & Budapest	Austrian Comp Soc, Wollzeile 1-3, A-1010 Wien, Austria. Tel: +43 1 5120235, Fax: +43 1 51202359, ifip98@ocg.or.at, http://www.ocg.or.at/ifip98.html
14-16 Sept SSAP	Statistical Signal & Array Processing	Oregon USA	Fu Li, Dept of Elec Eng, Portland State Univ, Portland, OR 97035-0751 USA. Fax: +1503 7253824, ssap-98@ee.pdx.edu, f.li@ieee.org, http://www.ee.pdx.edu/conferences/SSAP-98/
14-17 Sept BMVC'98	Computer Vision	Southampton UK	BMVC98, ISIS, Dept of Elec & Comp Eng, Southampton Univ Southampton SO17 1BJ, UK. http://peipa.essex.ac.uk/BMVC98/
7-9 Oct TFTS'98	Time-frequency Time-scale	Pittsburgh USA	R Nadell, Palisades Inst for Research Services, 201 Varick St, New York, NY 10014, USA. Tel: +1 212 620 3341, Rnadell@newyork.palisades.org, http://www.pitt.edu/tfts98
26-28 Oct CSC'98	Circuits, Systems and Computers	Greece	N Mastorakis, Military Inst of Univ Education, Hellenic Naval Academy, Terma Hatzikyriakou, 18539, Piraeus, Greece. mastor@softlab.ntua.gr, Tel: +30 1 7775660, Fax: +30 1 7775660, http://www.softlab.ece.ntua.gr/mastor
28-30 Oct IV'98	Intelligent Vehicles	Stuttgart Germany	A Broggi, Dipartimento di Ingegneria dell'Informazione, Universita di Parma, I-43100 Parma, Italy. Fax: +39 521 905723, broggi@ce.unipr.it, http://www.ce.unipr.it/iv98 http://www.daimler-benz.com/research/events/iv98.htm
1-6 Nov SPIE	Intelligent Systems for manufacturing	Boston	spie@spie.org, http://www.spie.org/info/am/
4-6 Nov ISPACS'98	Intelligent Signal Processing	Melbourne Australia	ISPACS'98, Dept of Digital Systems, Monash University, Wellington Rd, Clayton 3168, Australia. Tel: +61 3 99053402, Fax: +61 3 99053574, http://www.dgs.monash.edu.au/ispacs98/ ispacs98@dgs.monash.edu.au
17-19 Nov MVA'98	Machine Vision Applications	Makuhari Chiba, Japan	K Ikeuchi, Inst of Industr Sci, Univ of Tokyo, 7-22-1 Roppongi Minato-ku Tokyo 106 Japan. Tel/Fax: +813 34011433 ki@iis.u-tokyo.ac.jp, http://www.etl.go.jp/etl/gazo/mva98/
23-25 Nov ICAPR'98	Pattern Recognition	Plymouth UK	S Singh, School of Computing, Univ of Plymouth, Plymouth PL4 8AA, UK. Tel: +44 1752 232 612, Fax: +44 1752 232 540, Http://www.soc.plym.ac.uk/soc/icapr
1999	Event	Location	Contact
13-15 Jan ICVS'99	Vision Systems	Canary Islands	Centre for Autonomous Systems, NADA/CVAP, Kungliga Tekniska Hogskolan, S-100 44 Stockholm, Sweden. icvs@m Mozart.dis.ulpgc.es, http://Mozart.dis.ulpgc.es/ICVS/
18-20 May PRIP'99	Pattern Recognition	Minsk Belarus	R Sadykhov, Dept of Computer Systems, Belarussian State University of Informatics & Radioelectronics, ul P Brovki 6, 220600 Minsk, Belarus. Tel: +375 17 2310982, Fax: +375 17 2318403, prip99@newman.basnet.minsk.by
2-4 June PRP-VI	Pattern Recognition	Vlieland Netherlands	PRP VI, Dept of Medical Informatics, Erasmus Univ, PO Box 1738, 3000 DR Rotterdam, The Netherlands, Tel: +31 10 4087050, Fax: +31 10 4362882, prp6@mi.fgg.eur.nl
4-6 June SCIA'99	Image Analysis	Greenland	H Welling, Dept of Math Modelling, Building 321, Technical Univ of Denmark, DK-2800 Lyngby, Denmark. Fax: +45 45881397, http://www.diku.dk/scia99 , scia99@imm.dtu.dk
1-3 Sept CAIP'99	Images & Patterns	Ljubljana, Slovenia	F Solina, Univ of Ljubljana, Faculty of Comp & Inf Science, Trzaska 25, 1001 Ljubljana, Slovenia. Tel: +386 61 1768 389, +386 61 1768 256. Fax: +386 61 1264 647, franc@fri.uni-lj.si, ales.leonardis@fri.uni-lj.si, http://razor.fri.uni-lj.si/CAIP99
13-15 Sept KI	Tagung	Bonn Germany	A B Cremers, abc@informatik.uni-bonn.de
15-17 Sept DAGM	Pattern Recognition	Bonn Germany	W Forstner, wf@ipb.uni-bonn.de, www.ipb.uni-bonn.de/DAGM/dagm99/welcome.html

YEAR AT A GLANCE CONFERENCE PLANNER

Contact Addresses Pages: 10-11 Previous Reports are shown in Brackets (volume, number)
 • = submission date □ = final camera ready copy numbers = actual meeting dates

Conference	Location	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March
NMBIA'98	Glasgow	□ 10			1-3								
MIUA	Leeds		□ 18		6-7								
AIENG'98 (v20n1)	Ireland				7-9								
IGARSS'98 (v20n1)	Seattle				6-10								
SCI'98	Orlando		□ 11		12-16								
IMDSP (v20n1)	Austria				12-16								
WG8.1	Beijing	□ 15			15-17								
SPIE	San Diego			□ 22	19-24								
SIRS'98 (v20n1)	Edinburgh			□ 8	21-23								
ICIPS'98	Australia		□ 31			4-7							
DSP'98 (v20n1)	Utah	□ 1				9-12							
SPR'98 (v20n1)	Sydney		□ 1			11-13							
SSPR'98 (v20n1)	Sydney		□ 1			11-13							
MINAR'98 (v20n1)	Hong Kong	□ 15				13-14							
14 ICPR (v19n3)	Brisbane		□ 4			17-20							
BASYS'98	Prague	□ 15				26-28							
IFIP	Vienna					31-	4						
EUFIT'98 (v20n1)	Rome						7-10						
EUSIPCO-98 (v20n1)	Rhodes	□ 30					8-11						
SSAP	Oregon		□ 22				14-16						
BMVC'98	Southampton		• 1		□ 10		14-17						
SS'98 (v20n1)	Rome						21-23						
SSIT'98 (v20n1)	Minsk						28-30						
ICIP'98 (v20n1)	Chicago			□ 5				4-7					
TFTS'98	Pittsburgh				□ 31			7-9					
VLBV'98 (v20n1)	Urbana		• 1				□ 1	8-9					
MICCAI (v20n1)	Boston				□ 21			10-13					
WACV'98 (v20n1)	Princeton	• 1			□ 15			19-21					
CSC'98	Greece							26-28					
IV'98	Germany							28-30					
SPIE	Boston							□ 5	1-6				
ISPACS'98	Australia			• □ 6					4-6				
MVA'98	Japan		• 15				□ 15		17-19				
ICAPR'98	Plymouth		□ 1						23-25				
ICVS'99	Canary Isl		• 30				□ 30			13-15			
PRIP'99	Minsk								• 15				
SCIA'99	Greenland								• 2				□ 1
PRP-VI	Vlieland								• 1				
CAIP'99	Slovenia										• 15		

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