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,

I read recently a very fascinating story in G Wyszecki and W S Stiles book on Colour Science, which was attributed to Redhead, who had attributed it to H R Post: Once upon a time there was a farmer who often had to construct gates for his fields. Over the years he noticed, that to construct the gate he needed two pieces of wood of length x, for the horizontal beams of the gate, two pieces of wood of length y, for the vertical beams of the gate, and one piece of wood of length l to put across the diagonal. He was a clever farmer and he noticed that the larger x and y were, the larger l should be. However, he did not know Maths and he had never heard of Pythagoras. Over the years, he worked out that l should be a little shorter than $x + y$ and in fact he defined an (unknown) function $\epsilon(x + y)$ to express their relationship. During the long winter nights when work in the farm was not possible, he amused himself by working out, using his experience, plots of $\epsilon(x + y)$ versus x, plots of $\epsilon(x + y)$ versus $x + y$ and so on. All very complicated, but carefully done to help him and his descendants be able to work out from the graphs what size pieces of wood they would need in order to construct a gate of a certain size.

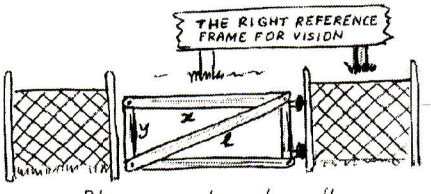
This story is fascinating because it echos a lot of what often goes on in Science: Ptolemy developed an elaborate theory on epicycles to explain the movement of the planets around the Sun, based on the premise that the Earth was at the centre of the planetary system. If he could only had paid attention to Aristarchus who 360 years earlier had argued that the Sun must be at the centre of the planets, things would have been so much easier! It took another 1400 years before Copernicus came along to re-discover Aristarchus theory and make redundant the elaborate epicycles of Ptolemy. The story repeated itself with Maxwell's equations and Lorentz transforms. It took Einstein to put the whole issue right, by making a simple conjecture: The mass of an object changes when it moves.

Please note that all submissions to the newsletter should be sent to the Editor, NOT the IAPR Secretariat. Also, all inquiries concerning late deliveries and notifications of change of address, should be addressed to the national representatives of each society. Only inquiries concerning the BULK deliveries to member societies should be addressed to the Editor.

I was recently in a workshop in Belize and there I heard Rama Chellapa saying the unforgeable: "In Computer Vision, we do not solve the problems; we just get tired of them!" Is it because our Copernicus has not come along yet? Or is it even worse, our Aristarchus has not been born yet? How far do we have to go before something clicks and all falls into place? Perhaps the farmer's son will do Pythagoras at school, go home tell his father and all will be straightforward from there and on! And perhaps the farmer will find something else to fill up his long winter nights, hopefully another mathematical game!

Maria Petrou

PS: I come to think now, that as the editor of IAPR I really ought to say that the farmer himself should actually attend the 13th ICPR in Vienna where ALL issues of Pattern Recognition will finally be sorted out!



CORRECTIONS TO THE DIRECTORY

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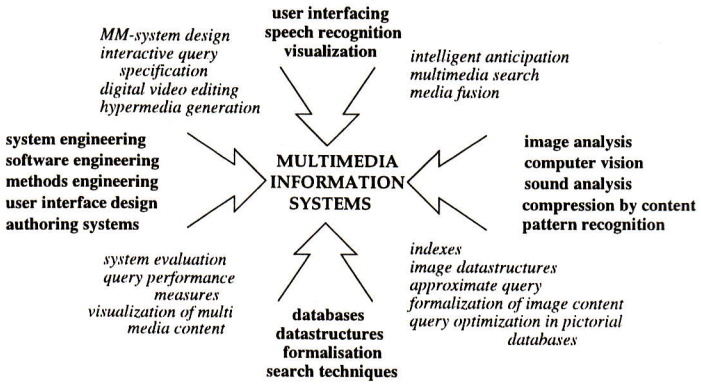
New contact person for the Finish Pattern Recognition Society (264 members): *Mr Markku Hauta-Kasari, Laboratory of Information Processing, Lappeenranta University of Technology, P.O.Box 20, FIN-53851 Lappeenranta, FINLAND Fax: +358 53 621 3456, Email: hatutus@lut.fi*

Technical Commitee 12 gets off the ground!

Multi media information is all around us. Where man has survived so long without it, it now seems it is almost impossible to go without.

Apart from slogans as these, there is a wealth of interesting scientific questions in the handling of multimedia information. Consider the following list of topics: *image databases, visual information systems, fusion with other media, image compression by content, image indexing, searching large information bases, query by pictorial / other media content, visualization / sonification of image content, hypermedia / multi media authoring, video / sound editing.*

The research in this area is on the crossroad of four disciplines



Given the achievements in the standing disciplines, can we make progress in the research areas between the disciplines? Or do we search for new ways to solve problem areas?

If these multi media are of interest to you please attend the TC–12 workshop on "Image Databases and Multi Media Search" in Amsterdam on 22 and 23 of August this year, just preceeding the ICPR in Vienna. For further information: `idb-mms@fwi.uva.nl` Or, if you cannot come and participate, join the TC by sending an e-mail to its chairs: Arnold Smeulders, University of Amsterdam, `smeulder@fwi.uva.nl` or Horace Ip, City University Hong Kong, `CSHIP@cityu.edu.hk`

And the winner of the King Sun Fu award is....

TEUVO KOHONEN

Professor Teuvo Kohonen of Helsinki University of Technology (Finland) has been chosen as the recipient of the 1996 King-Sun Fu Prize in pattern recognition. Formal presentation of the prize will be made on 26 August 1996 at the Association's biennial international meeting in Vienna, Austria. The prize, which consists of a plaque and a cash award, is given once every two years to an individual in recognition of a technical contribution of far-reaching significance and impact on the field of pattern recognition or its closely allied fields.

The King Sun Fu Prize is the premier award in the field of pattern recognition. It is named after the late Professor King-Sun Fu, a professor at Purdue University (USA), a pioneer and leader in the field of pattern recognition who helped found the International Association for Pattern Recognition and served as its first president. Professor Fu died in 1985. The prize is derived from a fund set up by his family and friends to perpetuate his memory.

Teuvo Kohonen

Professor Teuvo Kohonen is best known as one of the pioneers in neurocomputing, especially applying neural networks to pattern recognition. Over the years, he has introduced several now classical algorithms and methods. The influence he has on the contemporary research is indicated by the more than 1700 recent publications world wide in which the most central of his ideas, the Self-Organising Map (SOM) algorithm, is analysed and applied to data analysis and pattern recognition problems.

Teuvo Kohonen started his career in the 50's as a physicist. He soon turned to computer science and electronics and was appointed full Professor of Electronics at the Helsinki University of Technology, Finland, in 1965, at the age of 30. During a visit to the University of Washington in the late 60's he became interested in associative memories, which became a central topic in his research work of that time, culminating in the books "Associative Memory - a System-Theoretical Approach" (Springer-Verlag, 1977) and "Content-Addressable Memories" (Springer, 1980). Kohonen introduced the optimal associative memory operators which greatly improved the capacity of previous correlation type memories, and discussed extensively their realizations in neural circuits. An extension of this work to pattern recognition was a supervised competitive-learning algorithm, the Learning Subspace Method (LSM), which is based on adaptive orthogonal projection operators. Kohonen, with his group, developed fast hardware to cope with the "neural network" computations to make the LSM work in real time for speech recognition.

Kohonen's research on the SOM began in early 1981. What was required was an algorithm that would effectively map similar patterns, or vectors close to each other in the input space, onto contiguous locations in the output space. Numerous experiments were made, including the phoneme map used in speech recognition. Extensions of the SOM like the Supervised SOM and Learning Vector Quantisation (LVQ) algorithms brought further improvements in classification accuracy. In addition to such statistical pattern recognition algorithms, Kohonen introduced methods for the symbolic post-processing in speech recognition, like the Redundant Hash Addressing (RHA) and the Dynamically Extending Context (DEC) algorithms. Especially the SOM algorithm was one of the strong underlying factors in the new popularity of neural networks starting in the early 80's. It is the most widely used neural network learning rule in the class of unsupervised algorithms, and has been implemented in a large number of commercial and public domain neural network software packages.

The best source to the details and applications of SOM are Kohonen's books "Self-Organisation and Associative Memory" (Springer, 1984) and the recent "Self-Organising Maps" (Springer, 1995). Presently, Teuvo Kohonen is working on a new type of feature extraction algorithm, the Adaptive-Subspace SOM (ASSOM), which combines the old Learning Subspace Method and the Self-Organising Map. It does also something more than most artificial neural network algorithms do: it detects invariant features to achieve eg translational invariance to input patterns. Kohonen has shown how the well-known wavelet preprocessing can now be made to emerge automatically, without prior definition of the basis functions. Another branch of his present research is applying the SOM algorithm to the automatic categorisation of large collections of free-format text documents like those available on the Internet. The method is called the WEBSOM algorithm.

Professor Kohonen has had a leading role in getting the pattern recognition activities started in Finland. Soon after the establishment of IAPR at the end of 1976, Kohonen called together the first meeting of the Pattern Recognition Society of Finland in May 1977. This society was among the very first ones to form IAPR. Kohonen served on the Governing Board of IAPR for about 10 years and was the First Vice President from 1982 to 84. He was the chairman of the second Scandinavian Conference on Image Analysis (SCIA) in 1981 and was influential in getting this IAPR-sponsored conference series firmly footed in the Nordic countries. From the mid-eighties, Kohonen has been active in the foundation and organisation of neural network societies like the International Neural Network Society (INNS) and the European Neural Network Society (ENNS), of which he was the first president. He has been acting as chairman and plenary speaker in numerous international neural network conferences and is an invited member of several learned societies. He was one of the first three persons to be awarded the IEEE Neural Network Council Pioneer Award in 1991 and one of the two recipients of the IEEE Signal Processing Society Technical Achievements Award in 1996. In 1992 he received the International Neural Network Society Lifetime Achievement Award, and in 1996, the Centennial Award of the Engineering Societies of Finland, which is usually awarded to one person at a time, at intervals of ten years. In 1993, Kohonen was appointed permanent Academy Professor of the Academy of Finland, and he is presently leading the Neural Network Research Centre at the Helsinki University of Technology.

Continue on page 4

THE EUROPEAN COMPUTER VISION NETWORK
Award for Excellence in Transfer of Technology in Computer Vision

The European Computer Vision Network is offering an award for recognition of excellence in the transfer of computer vision technology from the laboratory to applications. The prize for this award will be a cheque for 1000 ECU, a plaque, and public recognition at the International Conference for Pattern Recognition (ICPR) in Vienna, the 25-30 August 1996. This award is intended to be the first of an annual series. The award will be presented to a project team composed of scientists and/or engineers by the ECVnet Industrial activities committee on the basis of nominations received by the awards committee at the address listed below. Nominations should describe the novel use of computer vision techniques for a product or an industrial process or service within the last 10 years. Nominations may nominate themselves or others.

The nominations should explain the technique used and the application area in 300 words or less, clearly indicating: 1) The novelty of the approach, 2) The generality of the process or technique for other applications, 3) The potential for market, market need and size, how likely the approach is to be duplicated. Supporting documentation (reports, papers, press cuttings, etc.) may be added.

Eligibility: To be eligible a team must be physically based in the European Union. Project teams may include members from more than one institution or corporation. The award will be granted to the individuals or to the institution, as specified in the application.

Scope: Computer vision is intended here in the largest possible sense. Any process which involves sensing, measurement or control using analysis or interpretation of images is eligible. This includes such diverse domains as medical image processing, satellite image interpretation, industrial inspection, video-suveillance, highway monitoring, manufacturing processes, robot vision, etc. inspection, video-suveillance, highway monitoring, manufacturing processes, robot vision, etc.

Runners up: If a sufficient number of interesting nominations are received, the awards committee may organise a presentation workshop.

The European Computer Vision Network (ECVnet) is an association of public, private and industrial research laboratories devoted to the advancement of the science and technology of computer vision in Europe.

The deadline for applications is 10 August 1996. Please send nominations or request for further information to: ECVnet Technology Transfer Prize, c/o Patrick Courtney, ITMI-Aptor, 61 Chemin du Vieux Chene, 38244 Meylan, FRANCE. tel +33-76-41-4017 or fax +33-76-41-2805. email: Patrick.Courtney@itmi.cgs.fr

Award Committee Members: **Ching Y Suen,** *Centre for Pattern Recognition and Machine Intelligence (CENPARMI), Concordia University, Suite GM-606 1455, de Maisonneuve blvd West Montreal QC H3G 1M8, Canada.* **Rejean Plamondon,** *Ecole Polytechnique de Montreal Departement de genie electrique et de genie informatique C.P. 6079, Succursale Centre-Ville Montreal QC H3C 3A7, Canada.* **Jurgen Schuermann,** *Daimler Benz AG, Wilhelm-Runge Str 11, D-89081 Ulm, Germany.* **Sargur Srihari,** *CEDAR, 520 Lee Entrance, Suite 202, UB Commons, SUNY at Buffalo, Amherst, New York 14221-2567, USA.* **Guy Lorette,** *IRISA, Universit de Rennes I, Campus de Beaulieu, 35042 Rennes Cedex, France.*

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NICE IF YOU CAN GET IT!

During ICDAR'95 in Montreal, it was decided, at the IAPR, TC-11 meeting, that an Award Program should be established to recognise individuals who have made outstanding contributions to the field of Document Analysis and Recognition in one or more of the following areas:

- Research
- Training of students
- Research/Industry interaction
- Community service

Every two years, three awards will be given, one of these being specifically dedicated to a young investigator (less than 40). Each award will consist of a token gift and a suitably inscribed certificate. The first set of these awards will be presented at ICDAR'97 by the ICDAR'95 officers.

Recommendations for the awards should be addressed to any members of the Award Committee. The nominations should arrive before January 15, 1997. They should be supported by at least five active researchers from at least three different countries and should include a brief summary of the nominee's qualifications for receiving the award (maximum 3 pages). The final decision will be made by the Award Committee.

It is very much hoped that the winners will be present in Ulm, Germany, at ICDAR'97 to receive their award in person, and we ask nominators to make discreet enquiries in advance to ensure that there is a reasonable likelihood of their nominee attending the conference.

Continuation from page 3

For those who know Teuvo Kohonen personally, he is foremost a true scientist, a deep and dissident thinker, refusing to join any fashions for their own sake. Teuvo cuts his own path, as evidenced for example by his work on neural networks in the 70's, when the field was unpopular and most people had turned to other, more trendy directions. This relentless pursuit of ideas that he believes to be useful, the "stick-to-itiveness", is his prevalent characteristic. As shown by the popularity of his text-books and lectures, he has the knack of explaining his thoughts in a clear and enjoyable style. His life's work has had and will have a far-reaching impact on artificial neural networks and statistical pattern recognition.

Erkki Oja

BOOK REVIEWS

The Statistical Analysis of Time Series, by *T W Anderson*, John Wiley & Sons, 1994, 704 pp, ISBN 0-471-04745-7

The book is the new edition of the book which grew out of a graduate course that T W Anderson, Professor of Statistics and Economics, gave for many years at Columbia University.

The book presents the mathematical theory of statistical inference concerning probabilistic models that are assumed to generate observed time series. The probability model may involve a deterministic trend and a random part constituting a stationary stochastic process. The statistical problems treated have to do with the aspects of such trends and processes.

The book is organized into ten chapters and two appendices. In Chapter 1 a general introduction to the topic is provided. The author has described here the material included as well as the limitations. The more basic and important topics are treated here. Many of the statistical techniques used in time series are those of regression analysis (classical least squares theory) or are adaptations or analogues of them. In Chapter 2 these methods are summarized. Chapters 3 and 4 deal with so-called error models in which the observed time series is treated as the sum of systematic parts or trend plus random parts or error. Chapter 5 is devoted to autoregressive processes which are useful in applications and which illustrate stationary stochastic processes. Statistical inference for these models is basic to the analysis of stationary processes "in the time domain". Chapter 6 is an extensive study of serial correlation and tests of independence. The general types of models are developed from the stochastic difference equation model; for these exponential models, optimal tests of dependence are derived 3 and the multiple decision procedure is developed from these tests. Some explicit models are defined for known and uknown means. Exact distributions of serial correlations, as well as approximate and joint distributions are obtained. In Chapter 7 the mathematical theory of stochastic processes and their spectral distribution functions and densities are discussed, but not developed thoroughly and rigorously, since it is not required for the purposes of the discussion. Chapter 8 develops the theory of statistics pertaining to stationary stochastic processes. Estimation of the spectral densities is treated in Chapter 9 and it forms the basis of analyzing the stationary process "in the frequency domain". Chapter 10 generalizes the regression analysis presented in Chapter 2 to stationary random terms and also includes extentions of the material in Chapters 6, 8 and 9.

There are many problems posed at the end of each chapter except the first. Solutions which are referred to in the text or which demonstrate some particularly important point are printed in Appendix B. In Appendix A results of the analysis of the empirical time series (the annual wheat price index, sunspot numbers) and the autoregressive processes generated by random numbers are presented.

The book is well written and has a good style. Some knowledge of matrix algebra is needed and a general knowledge of statistical methodology is usefull; the reader is expected to know the standard material of univariate analysis, the multivariate normal distribution, and the elementary ideas of estimation and hypothesis testing. A moderate knowledge of advanced calculus is assumed.

The book is suitable as a text for a graduate course. Besides, this book can furnish a means by which statisticians and others can learn about time series analysis without resorting to a formal course. Reading this book and doing selected exercises may lead to a considerable knowledge of statistical methodology useful for the analysis of time series.

Jana Novovičová, Inst. of Information Theory and Automation, Czech Academy of Sciences

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Handbook of Image Processing Operators by *Reinhard Klette and Piero Zamperoni*, John Willey & Sons, 1996, 397 pages, ISBN 0 471 95642 2

There are a lot of books with the words "Image Processing" in their titles. For example, the reviewed handbook mentions 11 such books! I think that the handbook is not the 12th book in this collection and not the least one! The first word in the title, "Handbook", defines the main goal of the book: to give an accurate description of well-studied operators used for image processing. It may be used both as a textbook and as a reference book. The authors use a practical approach, helping any user to find an effective solution in the ocean of processing methods and algorithms.

In our country people say that in any barrel of honey there is a drop of tar. Let us start our review from the honey!

Chapters 1 to 3 give fundamentals and general concepts of practical image processing by computer. The book defines basic terminology (image, sub-image, function, operator) and describes general algorithmic fundamentals (efficiency, image data, control structures, basic procedures: rank, sort and so on).

Specific operators are also described in the book. The text is devoted to standard image processing operators and transformations: Coordinate transforms and geometric operators; Gray scale transformations and point operators; Window functions and local operators; Global operators. The description of each operator is structured into five paragraphs: (1) characterisation, (2) mathematical definition, (3) comments, (4) algorithm description in pseudo-Pascal, (5) bibliographic references. Details of the contents and some other information can be found in the internet address *http://www.cs.tu-berlin.de/klette/Books.html/wiley96.html*.

All algorithms are also given in software. The source codes (C language) for the programs are available on a disk for UNIX and MS-DOS systems. One can find details on http://www.cs.tu-berlin.de/schimkew/handbook.html. I have checked several programs and found them well done.

A 20-page glossary is a useful part of the handbook. It is not a copy of the well-known glossary of Haralick and Shapiro. A seven-pages Index closes the book.

It happened so that I have the initial German version of the book also and I can compare both variants. The English variant has several corrections in references and algorithm descriptions in comparison to the source German book. I hope the number of inevitable errors should be smaller too, because I saw working materials and know how careful the authors are.

OK! Let us find a drop of tar. We need a magnifying glass to do this, but nevertheless one can find several mini-drops. For example, it seems to me that T Pavlidis wrote his well known book in English, and the English edition of the handbook should contain reference to the source: T Pavlidis, "Algorithms for Graphics and Image Processing", Computer Science Press, Rockville, Maryland, 1982. The second hidden drop is in Chapter 3 where different sorting procedures are given. It is well done, but it is better to add that when we sort N numbers and if N is less than 50, there is no difference between brute force and the best sorting algorithms. The German book was published in 1994 and an addition of several fresh publications updating the book's reference list would not be a bad idea. That was the third drop of tar in my mind! And some futile statistics: There are at least three 5-th paragraphs in the handbook containing exactly three references and all of them have titles "Digital Image Processing"!

Seriously speaking, the handbook is a very pleasant book both for students and for scientists and it is a very practically oriented one.

Valery Starovoitov
Institute of Engineering Cybernetics, Belarus

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Advances in Applied Statistics: Statistics and Images I (Edited by *K V Mardia,* ISBN 0-902879-25-1), **Statistics and Images II** (Edited by *K V Mardia and G K Kanji*, ISBN 0-902879-45-6), Carfax Publishing Company

Once upon a time, in the 16th century, there was somebody, a mere nobody, who, however, happened to understand the affairs of the **state**, and thus they called him **statist**. Almost two hundred years later, his descendants, some other somebodies who were mere nobodies, were knowledgeable in **Statistics:** "A branch of political science, dealing with the collection, classification and discussion of facts bearing on the condition of a state or a community." Another hundred years passed and somebody, who turned out not to be nobody, called Gauss, came along. He happened to like Maths and he thought it would be reasonable to find an average of some experimental data he had, by minimising the sum of the squares of their errors: Estimation theory was born and its first child: Least Squares Error Estimation! Another hundred years on and we have the "Advances in Applied Statistics"! Behind such a general title, anything could be hidden, and everything is (not just the hidden Markov models)! In fact, all the great grand children of Estimation married to Images and beyond are there: From low level image processing, to high level vision!

A lot of water passed under the bridge since the time Statistics was used only for helping the government run the country. Statistics is now used to model the function of the very organ that created it, the human brain itself and the process of cognition. That is what these two volumes are about: From Markov Random Fields for modelling texture, to Neural Networks, from face shape description to models of resistors, from Medicine to Satellite Remote Sensing, from first principles to the most sophisticated approaches that rely on formulae that look like Greek text!

A section of the first volume is devoted to collecting together the seminal works that set the foundations of modern use of statistics to image analysis in the eighties: Geman & Geman, Besag, and Grenander & Mac Rea Keenan. The rest of the sections are devoted to the basic principles of Neural Nets, Wavelets, Markov Meshes (hidden and revealed(!)), Markov fields for texture and object modelling, sensor noise modelling, class variability modelling, posture variability modelling, Contextual decision making, Statistical morphology, deformable templates, with applications to Astronomical, Medical, Industrial, Radar and Electron Microscope images; you name it, it is in! Several articles are of tutorial nature while many others are more advanced, but all rigorously presented. A great collection of articles, with many great names contributing their best. It is impossible to give a complete overview of the contents, and a partial one would be inappropriate, as I would have to leave out significant contributors and contributions.

I will finish by quoting a graduate student of mine. When he returned one of the volumes which I had let him to help him get unstuck with his work, he said: "This book is a treasure! I wish I had it earlier!". This really sums up my review of the work!

Maria Petrou

Special issue of Machine Vision and Applications: "Performance Characteristics of Vision Algorithms"
Guest editors: H. I. Christensen and W. Foerstner

Topics:

- Theory and strategies for performance analysis of vision algorithms
- Linking analysis of vision experiments to the theory underlying the algorithms
- Characterization of the limitations of vision algorithms and/or the class of image data for which a vision algorithm is suited or not suited
- Demonstrations of the usefulness of performance characterization and/or the limitations of statistical testing in Computer Vision Modularization of vision tasks and the characterization of networks of vision algorithms

Guidelines for authors and style files for LaTeX may be retrieved directly from Springer Verlag at the address gopher://trick.ntp.springer.de/11/tex/latex/ljour2/ Submit papers before 15 August 1996 to:
Dr Henrik I Christensen, Center for Autonomous Systems, Numerical Analysis and Computing Science, Kungliga Tekniska Hogskolan, S-100 44 Stockholm, Sweden
E-mail: `hic@vision.auc.dk`

CONFERENCE REPORTS

Report on RecPad'96 (Reconhecimento de Padroes)

21–22 March, Guimaraes, Portugal

The 8th Portuguese Conference on Pattern Recognition (RecPad'96, March 21–22, Guimaraes, Portugal) was organised by the School of Engineering of the University of Minho, on behalf of the Portuguese Association for Pattern Recognition (APRP). Relative to last year's conference, which I had the chance to attend and appreciate (see my report on IAPR Newsletter, 17, 3, July 1995), RecPad'96 has improved both in terms of numbers and the geographical distribution of the contributions. In fact, for the first time in the history of RecPad parallel sessions were necessary to allocate all the accepted contributions. Moreover, 25% of the submissions came from abroad. Although the meeting was a national meeting, the conference language was English. Also, apart from a number of Portuguese participants, the conference attracted attendees from other countries such as Angola, Bulgaria, France, Italy, Japan, Poland, Slovenia, Spain, Sweden, Taiwan and the UK. Maybe it is time for RecPad to become an international conference!

In addition to two invited lectures given in plenary sessions, the scientific program included about 60 oral contributions, presented in two parallel sessions, and 14 posters. The invited lectures were given by Prof. Goesta Granlund (Linkoeping University, Sweden), who talked on important issues concerning representation of multidimensional information, and by Prof. Bernard Buxton (University College London, UK), who reviewed some recent developments in the application of statistical techniques, both at the pixel and object levels. Oral presentations covered various areas of Pattern Recognition, Signal and Image Processing, and Computer and Robot Vision, as well as application areas like Inspection and other Industrial Applications, and Specific Hardware and Software Developments. Contributions submitted for oral presentation were reviewed by two referees, in the form of extended abstracts, while summaries submitted for poster presentation were accepted without any revision. In fact, the purpose of the poster sessions was to give the opportunity to young researchers to present the results of their activity, even if these were only preliminary ones.

At the end of the conference, the APRP prize was assigned to "A new method for quantitative evaluation of edge maps", by A J Pinho and L B Almeida. The RecPad proceedings, a substantial 500-page book, can be bought, on a first come first served basis, for 5000 Portuguese escudos, plus postage. Details can be obtained by contacting the following email address: recpad96@eng.uminho.pt.

Besides the quality of the scientific program, the warm atmosphere, the pleasant conference lunches -washed down with good Portuguese wines- and a luxurious banquet contributed to make RecPad a successful conference. The banquet was at the "Pousada de Santa Marinha", a wonderful stately building that was formerly a monastery. Before enjoying a superb dinner, the participants could admire the beautiful "azulejos" (baked clay tiles, mostly painted in blue and white) covering the stone staircase leading to the Chapter Hall, the Chapter Hall itself, and the veranda of Frei Jeronimo, from which a fine view over Guimaraes was possible. The next RecPad will be held in 1997 in Coimbra, the most sung town in Portugal, seat of one of the oldest universities of the world. Remember to check the calendar!

Gabriella Sanniti di Baja
Istituto di Cibernetica, Italy

CONFERENCE ANNOUNCEMENTS

ICDAR '97 Fourth International Conference on Document Analysis and Recognition [IAPR]

18–20 August 1997 Ulm, Germany

The conference is sponsored by the International Association for Pattern Recognition (IAPR) Technical Committees 11 and 10, the International Graphonomics Society (IGS), the German Association for Computer Science (GI), and the German Association for Information Technology (ITG).

This conference is a unique International Forum for identifying, encouraging and exchanging ideas on research, development and novel applications dealing with documents (in any language) and how to make the contents of document images computer-accessible. Topics:

Document Image Processing *Color Image Processing, Image Compression, Distortion Removal.*

Character Recognition & Segmentation *Touching & Broken Characters, Cursive Script Recognition, Isolated Unconstrained Characters, Large Vocabulary.*

On-Line Recognition *Handwritten Characters & Symbols, Drawings & Gestures, Pen Based Interface, Signature Verification.*

Storage & Retrieval of Documents *Document Image Filing, Automated Indexing, Information Extraction, Retrieval of Text and Pictures.*

Hypermedia Processing *Multimedia Processing, Electronic Books & Hypertext, Multimedia Databases.*

Applications and Systems *Forms & Bank-Cheque Reading, Office OCR Systems, Postal Automation, Geographical Information Systems, Industrial & Business Applications.*

Document Image Analysis *Layout Analysis, Logical Structure Analysis, Recognition of Forms.*

Text & Document Understanding *Text Analysis & Recognition, Use of Linguistic Knowledge, Use of Domain-Specific Knowledge, Multilingual Text Understanding.*

Map and Engineering Drawings Interpretation *Map Interpretation, Diagram/Drawing Understanding, Musical Score Recognition.*

Theoretical Approaches *Neural Networks, Genetic Algorithms, Expert Systems, Psychological Models, Image*

Degradation Models.

Implementations *Hard & Software-Architectures, Software Packages, Automatic Learning & Adaptation.*

Research Environments, *Software Tools, Research Databases, Performance Evaluation, Standardization.*

Submit four copies of a double-spaced complete paper of not more than 20 pages to one of the addresses below. The first page of the manuscript should contain a title, affiliation, mailing address, phone/fax numbers and e-mail address of the contact author. The second page should include a title, a 200-word abstract, and keywords. Papers accepted for presentation will be published in the conference proceedings, i.e. six pages (approximately 5000 words including figures) for long papers and four pages (3500 words) for short papers and poster papers.

Dr. Henry Baird AT&T Bell Laboratories 600 Mountain Ave, 2C-322 Murray Hill, NJ 07974 USA

Prof. Andreas Dengel German Research Center for Artificial Intelligence, DFKI P.O. Box 2080 67608 Kaiserslautern Germany

Prof. Yasuaki Nakano Dept. of Information Engineering Shinshu University 500 Wakasato, Nagano 380 Japan

Deadline for paper submission	**1 December 1996**
Notification of acceptance	**1 March 1997**
Deadline for camera ready copy	**1 May 1997**

PRIP'97 Fourth International Conference on Pattern Recognition and Information Processing [IAPR]

20–22 May 1997 Minsk, Belarus

The conference will provide a forum for scientists and engineers to exchange up-to-date technical knowledge and experience and define ways of further development of this field. The conference will focus on both theory and applications.

The Conference is organized by the Belarussian Association for Image Analysis and Recognition (IAPR member) in cooperation with Belarussian institutes: State University, Institute of Engineering Cybernetics, State University of Informatics and RadioElectronics, and Institute of Computer Science (Szczezin, Poland).

The topics of the Conference include, but are not limited to: Pattern Recognition, Image Analysis, Computer Graphics, Signal Processing, Systems and Parallel Architectures for Signal and Image Processing, Knowledge-based Expert and Decision Support Systems, Applications of Image Analysis.

Working languages of the Conference: English and Russian.

Papers for the Conference can be submitted in any working Conference language (preferably English). Papers should be submitted in three copies in a camera-ready format and they should not exceed 6 A4 size pages to the address on p 11. The text should be printed or type-written in 240x165 mm area in one column with 1.5 spacing 12-point Times Roman fond.

Deadline for paper submission	**10 December 1996**
Notification of acceptance	**1 March 1997**

3rd International Workshop on Visual Form (IWVF3) [IAPR]

28–30 May 1997 Capri, Italy

The 3rd International Workshop on Visual Form (IWVF3) is organized jointly by the Department of Computer Science and Systems of the University of Naples and by the Institute of Cybernetics of the National Research Council of Italy. IWVF3 is sponsored by the International Association for Pattern Recognition.

The goal of IWVF3 is to provide a discussion forum for researchers and practitioners interested in 2D and 3D shape analysis. Main topics include shape perception, representation, decomposition, description, and recognition.

The scientific programme will include invited talks as well as contributed papers that will be discussed in a single track, or presented as posters. The invited speakers are: Kim L. Boyer (USA), Jan-Olof Eklundh (Sweden), Robert M. Haralick (USA), Jan J. Koenderink (The Netherlands), Michael Leyton (USA), Gerard Medioni (USA), Jean Serra (France), and Steve W. Zucker (Canada).

Four copies of full papers (no more than 10 pages, double-spaced, 12-point font) should be submitted to the address on p 11. The manuscript should include a separate title page, containing the names and the addresses of the authors (including e-mail and fax), an abstract of up to 200 words, one or more topics as listed above, and 3-5 keywords that can be used to match submissions to reviewers.

Deadline for paper submission	**31 October 1996**
Notification of acceptance	**1 March 1997**
Deadline for camera ready copy	**1 May 1997**

First International Conference on Audio- and Video-based Biometric Person Authentication (AVBPA) [IAPR]

12–14 March 1997 Crans-Montana, Switzerland

The scientific programme will include the presentation of four invited talks and of contributed papers. The invited speakers are: Rama Chellappa (University of Maryland, USA) Sadaoki Furui (NTT, Japan) John Mason (University of Wales Swansea, UK) Tomaso Poggio (MIT, USA). The main technical areas are:

Features and Measurements: *Biometrics of face and voice, Still image based features, Multiple image based features, Motion/depth based features, Audio and lip-movements, Text dependent audio features, Text independent audio features.*

Decision Strategies for Audio- & Video-based Data: *Training procedures, Decision theory and strategies, Fusion of multiple decisions.*

System Architecture and Hardware: *Centralized versus distributed databases, Image and speech communication, Sensor resolution and recognition studies, Tracking cameras, Special sensors.*

The proceedings will be published by Springer in the Lecture Notes in Computer Science series.

Submit three copies of a full paper to the address on p11. Papers should be at most 6 pages long. since this is the estimated length of the proceedings version. The first page should contain the title of the paper, a 200-word abstract and 3-5 keywords. Send also a cover page with the title, the technical area of the paper, and the corresponding author's contact address.

Deadline for paper submission	**15 September 1996**
Notification of acceptance	**15 November 1996**
Deadline for camera ready copy	**15 December 1996**

CAIP '97 7'th International Conference Computer Analysis of Images and Patterns

10–12 September 1997 Kiel, Germany

Papers of original work include, but are not limited to, the following technical areas: *pattern analysis, low level processing and coding, segmentation and grouping, texture analysis, motion and stereo, shape representation, invariants, geometry, object recognition, human-machine interfaces, active, real-time vision, augmented reality, visual information management, vision guided robotics, human vision modelling, learning and neural networks in computer vision*

Five copies of full-length papers should be submitted at the address on p 11. The form of the manuscript should be as follows:

1. Cover page including title, author(s), postal address, e-mail address, FAX and phone number, an abstract up to 200 words, and one or more categories as listed above. It should be explicitly stated if the paper is submitted only for poster presentation.
2. Summary page containing answers to the following questions: (a) What is the original contribution of this work? (b) What is the most closely related work by others and how does this work differ?
3. The paper beginning with title and abstract, without authors and institution, should be no more than 10 pages (12-point fonts) including text, figures, and references.

Deadline for paper submission	**1 February 1997**
Notification of acceptance	**15 April 1997**
Deadline for camera ready copy	**20 June 1997**

UKROBRAZ-96 Third All-Ukrainian International Conference on Signal/Image Processing and Pattern Recognition

26–30 November 1996 Kyjiv, Ukraina

Submit 1) an application with full name, scientific degree and rank, post, place of work, address, phone and fax numbers and e-mail address; 2) two copies of a short paper report in Ukrainian or English with not more than 9000 characters, with abstract (not more than 900 characters) in Russian or English, to the address on p 11.

Deadline for paper submission	**1 October 1996**

International Workshop on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR'97)

21-23 May 1997 Venice, Italy

Topics include: Bayesian contextual methods, biology-inspired methods, discrete optimization, information theory and statistics, learning and parameter estimation, Markov random fields, neural networks, relaxation processes, statistical mechanics approaches, stochastic methods, deformable models, early vision, matching, motion, object recognition, shape, stereo, texture, with application to character and text recognition, face processing, handwriting, medical imaging, remote sensing, etc.

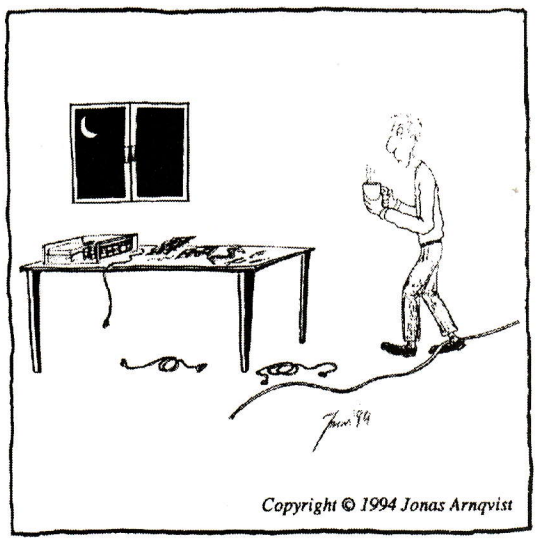
Submit four copies of no more than 15 page papers to the address on page 11.

Deadline for paper submission	**9 September 1996**
Notification of acceptance	**15 December 1996**
Deadline for camera ready copy	**February 1997**

NEW GOVERNING BOARD MEMBERS FOR SOUTH KOREA

Professor Seong-Whan Lee,
Dept. of Computer Science and Engineering, Korea University, Anam-dong, Seongbuk-ku, Seoul 136-701, South Korea, Tel: +82 2 920 2168, Fax: +82 2 926 2168,
`swlee@human.korea.ac.kr`

Professor Young Bin Kwon,
Dept. of Computer Engineering, Chungang University, Heukseok-dong, Dongjak-ku, Seoul 156-756, South Korea



For several months, until the new chip project was back on track, Brent would refuse to drink even the slightest bit of coffee.

Neural Networks are OK. However, their relationship to Physiology is like the relationship between a table and a dog: they both have four legs, and I do not agree with spending taxpayers' money to try to make the table bark! *Murat Kunt, after dinner speech at the IEEE Signal Processing Society's 9th Workshop on Image and Multidimensional Signal Processing, Belize, March 1996.*

FORTHCOMING CONFERENCES, WORKSHOPS AND EVENTS

1996	Event	Location	Contact
22–23 Aug IAPR TC-12	**IAPR TC-12 Workshop on Multi Media and Image Communications**	**Amsterdam, The Netherlands**	**Conference Secretary, Faculty of WINS, Department of Computer Science and Logic, University of Amsterdam, Kruislaan 403, 1098 SJ Amsterdam, The Netherland, +31 20 525 749, Fax: +31 20 525 746, idb-mms@fwi.uva.nl, http://www.fwi.uva.nl/research/idb-mms/**
25–30 Aug 13–ICPR	**13th International Conference on Pattern Recognition**	**Vienna, Austria**	**c/o Austropa Interconvention, A–1043 Vienna, POB 30, Austria. icpr@prip.tuwien.ac.at http://www.prip.tuwien.ac.at/icpr/icpr.html [IAPR]**
2–3 Sept TC7, TC8	**IAPR Workshops on Remote Sensing & Applications in Industry**	**Graz, Austria**	**Axel Pinz, Technical University Graz, Institute for Computer Graphics, Muenzgrabenstrasse 11, A-8010 Graz, Austria, pinz@icg.tu-graz.ac.at, tu-graz.ac.at/workshops/IAPR/welcome.html**
9–12 Sept BMVC	British Machine Vision Conference	Edinburgh, UK	Mrs Judith Gordon, Department of Artificial Intelligence, University of Edinburgh, 5 Forrest Hill, Edinburgh EH1 2QL, UK Tel: +44 131 650 3094, Fax: +44 131 650 6899, BMVC96@aifh.ed.ac.uk, http://peipa.essex.ac.uk
11–13 Sep DAGM	DAGM Mustererkennung (Pattern recognition) 1996	University of Heidelberg, Germany	Prof. Dr. Bernd Jaehne, Interdisciplinary Center for Scientific Computing, University of Heidelberg, Im Neuenheimer Feld 368, D-69120 Heldelberg, Phone: +49 6221 548827, bjaehne@giotto.iwr.uni-heidelberg.de
7–11 Oct AINT	Advanced Imaging and Network Technologies	Berlin, Germany	EUROPTO, Direct Communications GmbH, Xantener Strasse 22, D-10707 Berlin, Germany, Tel: +49 30 881 5047, Fax: +49 30 8868 2946, 100140.3214@compuserve.com
14–16 Oct DAS96 [IAPR]	**IAPR Workshop on Document Analysis Systems**	**Malvern, Pensylvania, USA**	**Suzanne Liebowitz Taylor, Loral Defense Systems-Eagan 70 E Swedesford Rd, Paoli, PA 19301-0517, USA das@vfl.paramax.com and http://www.vfl.paramax.com/das/**
14–16 Oct ICAFGR	2nd International Conference on Automatic Face and Gesture Recognition	Killington, Vermont, USA	Ms. Karen Navarro, Room E15-383, The Media Laboratory, Massachusetts Institute of Technology, 20 Ames Street, Cambridge, MA 02139 USA, Tel: +1-617-253-0872, Fax: +1-617-253-8874, fg96@media.mit.edu, ftp:/whitechapel.media.mit.edu/pub/conferences/ICAFGR96, http://fg96.www.media.mit.edu/conferences/fg96
14–18 Oct 3ICSP	3rd International Conference on Signal Processing	Beijing, China	Professor YUAN Baozong, Institute of Information Science, Northern Jiaotong University, Beijing 100044, CHINA, Fax: +86-010-8283458, Tel: +86-010-3240616, yuanbz@sun.ihep.ac.cn, yuanbz@bepc2.ihep.ac.cn
16–18 Oct AIPR '96	Workshop on Emerging Applications of Comp Vision	Washington DC, USA	David H Schaefer, Dept of Electrical & Computer Engineering, George Mason University, Fairfax, VA 22030, +1-703-993-1572, schaefer@gmu.edu
29–31 Oct ICSPAT '96	7th Conf on Signal Processing Applications & Technology	Santa Clara, CA, USA	DSP Associates, 49 River Street, Waltham, MA 02154, USA Tel: +1–617–891–6000, Fax: +1–617–899–4449, e-mail: icspat@dspnet.com
31 Oct-3 Nov EMBS 96	IEEE Engineering in Medicine and Biology	Amsterdam, The Netherlands	Basics International Conference Services, University of Twente, Po Box 217, 7500 AE Enschede, The Netherlands, Fax +31534356770, embs96@basics.utwente.nl, http://uro01.azn.kun.nl:8000/embs96/
4–7 Nov 3rd IWSIP	Image and Signal Processing Advances	Manchester, UK	Panos Liatsis, Braham Levy Control Systems Centre UMIST, UK
12–14 Nov MVA'96 [IAPR]	**IAPR Workshop on Machine Vision Applications**	**Tokyo, Japan**	**Prof. Mikio Takagi, Institute of Industrial Science, University of Tokyo, 7-22-1 Roppongi, Minato-ku, Tokyo 106, JAPAN, Tel: +81334790289, takagi@tkl.iis.u-tokyo.ac.jp, http://www.etl.go.jp:8080/etl/gazo/mva96/** Fax +81334026226
18–22 Nov ISAM	Intelligent Systems & Advanced Manufacturing	Boston, USA	Tel: +1-360-676-3290, Fax: +1-360-647-1445, info-pe96-request@spie.org
18–22 Nov VVDC	Voice, Video and Data Communications	Boston, USA	Tel: +1-360-676-3290, Fax: +1-360-647-1445, info-pe96-request@spie.org

FORTHCOMING CONFERENCES, WORKSHOPS AND EVENTS

1996	Event	Location	Contact
19–22 Nov 4-CIC	The Fourth Color Imaging Conference	Arizona, USA	Michael Stokes, Hewlett Packard, 1501 Page Mill Road, Palo Alto, CA 96304, USA. Tel: +1–415–857–3908, Fax: +1–415–857–4320, e-mail: stokes@hpl.hp.com
26–30 Nov UKROBRAZ-96	Ukrainian PR Conference	Kyjiv, Ukraina	Taras Vintsiuk, NAS Institute of Cybernetics, 40 Academician Hlushkov Avenue, Kyjiv 252022 Ukraina, Tel: +380 44 266-4356, +380 44 266-3018, +380 44 266-3019, +380 44 267-6035, Fax: +380 44 266-1570, vintsiuk@uasoiro.FreeNet.kiev.ua
2–4 Dec WACV '96	Third IEEE Workshop on Applications of Computer Vision	Sarasota, Florida, USA	Dr. Raj Talluri, Texas Instruments, Corporate Research & Development, P.O. Box 655474, M/S 238 Dallas, TX 75265, USA. http://www.ee.vt.edu/wacv96
1997	**Event**	**Location**	**Contact**
7–10 Jan HICSS'97	30th Hawai International Conference on Systems Sciences	Maui, Hawaii	Alberto Broggi, Dipartimento di Ingegneria dell' Informazione, Universita di Parma, Viale delle Scienze, I-43100 Parma, Italy, broggi@CE.UniPR.IT, Fax: +39-521-905723, http://WWW.CE.UniPR.IT/hicss/eccs
12–14 Mar AVBPA [IAPR]	**Audio & Video based Biometric person identification**	**Crans-Montana, Switzerland**	**Josef Bigun Swiss Federal Institute of Technology CH-1015 Lausanne, Switzerland, http://www.tele.ucl.ac.be/IMAGES/AVBPA**
20–21 March RecPad'97	Portugese PR Conference	Coimbra, Portugal	recpad97@dee.uc.pt
20–22 March CVRMed	Computer Vision, Virtual Reality, Robotics in Medicine	Grenoble, France	Dr Jocelyne Troccaz, CVRMed and MRCAS Conference, TIMC-IAB, Faculte de medecine de Grenoble, 38 706 La Tronche, Cedex France, jocelyne.troccaz@imag.fr, Tel: +33 76 54 9508, Fax: +33 76 54 9555, http://www-timc.imag.fr/cvrmed-mrcas
20–22 May PRIP'97 [IAPR]	**Pattern Recognition and Information Processing**	**Minsk, Belarus**	**V. Krasnoproshin, Faculty of Applied Mathematics, Belarussian State University, Fr. Scorina Av. 4, 220050 Minsk, Belarus, Fax: +375-172-31 84 03, abl@newman.basnet.minsk.by, dep04@fpm.bsu.minsk.by**
21–23 May EMMCVPR	Energy Minimization methods	Venice, Italy	Marcello Pelillo (EMMCVPR'97), Dipartimento di Matematica Applicata e Informatica, Universita' "Ca' Foscari" di Venezia, Via Torino 155, 30173 Venezia Mestre, Italy, pelillo@dsi.unive.it, http://Dcpu1.cs.york.ac.uk:6666/ãdjc/EMMCVPR97.html
28–30 May IWVF3 [IAPR]	**International Workshop on Visual Form**	**Capri, Italy**	**IWVF3 Scientific Secretariat, Istituto di Cibernetica, CNR, Via Toiano 6, 80072 Arco Felice, Napoli, Italy, iwvf3@imagm.na.cnr.it, http://amalfi.dis.unina.it/IWVF3/iwvf3cfp.html**
4–6 June PRP–V	Pattern Recognition in Practice V	Vlieland, The Netherlands	Dept. of Medical Informatics,Erasmus University, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands tel: +31 10 4087050; fax: +31 10 4362882; e-mail: prp5@mi.fgg.eur.nl
9–11 June SCIA'97 [IAPR]	**10th Scandinavian Conference on Image Analysis**	**Lappeenranta, Finland**	**SCIA'97, Department of Information Technology, Lappeenranta University of Technology, P.O.Box 20, FIN-53851, Lappeenranta, Finland, Fax: +358 53 621 3456, Email: SCIA97@lut.fi, WWW: http://www.lut.fi/scia97**
24–27 June ECSAP-97	European Conf on Signal Analysis and Prediction	Prague, Czech Republic	Prof Pavel Sovka, ECSAP Secretariat, Institute of Chemical Technology, Technicka 5, 166 28 Prague 6, CZ, ecsap@vscht.cz, http://www.vscht.cz/ecsap97/
18–20 Aug ICDAR '97 [IAPR]	**4th International Conf on Document Analysis**	**Ulm, Germany**	**Daimler Benz Research Center Ulm Wilhelm Runge Str. 11 89081 Ulm, Germany, Tel: +49-731-505-2151, Fax: +49-731-505-4105, icdar97@dbag.ulm.daimlerbenz.com, http://wwwicdar97.dbag.ulm.daimlerbenz.com/, http://www.rtna.daimlerbenz.com/spitz/icdar97.html**
10–12 Sep CAIP '97	Computer Analysis of Images and Patterns	Kiel, Germany	Prof. Dr.Gerald Sommer, Institut fuer Informatik, Christian-Albrechts-Universitaet Kiel, Preusserstr. 1-9, D-24105 Kiel, Germany, Tel: +49 431 560473, Fax: +49 431 560481, caip97@informatik.uni-kiel.de, http://www.informatik.uni-kiel.de/čaip97/

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	Sep	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug
TC7,TC8	Graz	2–3											
5 IWFHR (v17n3)	Colchester	2–5											
WIVC (v18n2)	Loughborough	4–5											
TIPMOR (v17n4)	Florence	5–6											
BMVC	Edinburgh	9–12											
EUSIPCO (v18n1)	Trieste	10–13											
DAGM	Heidelberg	11-13											
WCNN'96 (v18n2)	California	15-18											
ICIP'96 (v18n2)	Lausanne	16–19											
VBC'96 (v18n1)	Hamburg	22-25											
EUROPTO (v18n1)	Taormina	23–27											
ICGI-96 (v18n1)	Montpellier	25–27											
AINT	Berlin		7–11										
ICEVS'96 (v17n4)	Rodos		13–16										
DAS96	Pennsylvania		14–16										
3ICSP	Beijing		14–16										
ICAFGR	Vermont		14–16										
SMC (v17n3)	Beijing		14–17										
AIPR '96	Washington		□ 1, 16–18										
ICSPAT'96	California		29–31										
EMBS96	Amsterdam		31–	3									
IWSIP	Manchester			4–7									
AOII (v18n1)	China			4–7									
MVA'96	Tokyo	□ 13		12–14									
ISAM & VVDC	Boston			18–22									
4-CIC	Arizona			19–22									
UKROBRAZ-96	Ukraina		•□ 1	26–30									
WACV'96	Florida				2–4								
HICSS'97	Hawaii		□ 1			7–10							
AVBPA	Switzerland	• 15			□ 15			12–14					
RecPad'97	Portugal							20–21					
CVRMed	Grenoble	• 6			□ 20			20–22					
IWVF3	Capri		• 31						□ 1, 28–30				
PRIP'97	Belarus				• 10			□ 1		20–22			
EMMCVPR'97	Venice	• 9					□			21–23			
PRP-V (v18n1)	Vlieland			• 1						□ 1	4–6		
SCIA'97	Lappeenranta					• 1		□ 31			9–11		
ECSAP-97	Prague		• 10				□ 14				24–27		
ICDAR '97	Ulm				• 1					□ 1			18–20
CAIP '97	Kiel						• 1				□ 20		

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