

IAPR


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Newsletter

Volume 27 Number 4
October 2005

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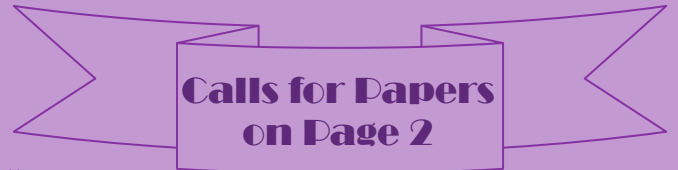
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This bulletin board has positions and a publication that will be of interest to IAPR members.



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Calls for Papers

[ICPR 2006](#)

18th International Conference on Pattern Recognition
Hong Kong
Deadline: December 15, 2005
August 20-24, 2006

[King-Sun Fu Prize 2006](#)

*To be presented at the 18th International Conference on
Pattern Recognition (ICPR 06)*
Hong Kong
Deadline: January 15, 2006
August 20-24, 2006

[S+SSPR 2006](#)

*11th International Workshop on Structural and Syntac-
tic Pattern Recognition (SSPR 2006)*
*6th International Workshop on Statistical Techniques in
Pattern Recognition (SPR 2006)*
Hong Kong
Deadline: January 31, 2006
August 17-19, 2006

[IWFHR 2006](#)

*10th International Workshop on Frontiers in Handwrit-
ing Recognition*
La Baule, France
deadline: February 15, 2006
October 23-26, 2006

[ICDAR 2007](#)

*9th International Conference on Document Analysis and
Recognition*
Curitiba, Parana, Barzil
Deadline: January 15, 2007
September 23-26, 2007

Feature Article

From the Editor—Contribute!

By Larry O’Gorman



In my two and a half years as editor of the *IAPR Newsletter*, I have established some regular, and some irregular, columns that are described on this page. I have another objective

for the *Newsletter*, that is, for a higher degree of participation from readers and members of the IAPR—all 7,500 of you. The *IAPR Newsletter* format allows contributions of many kinds: from feature articles to bulletin board items of interest. Each of these areas is discussed below in the context of the standard *Newsletter* format. See which area suits you best and let me know what kind of article you would be willing to contribute.

Feature Article – The *Newsletter* usually begins with a feature article. This is an article on a technical subject related to pattern recognition. The target audience is one with pattern recognition interest, though not necessarily with pattern recognition technical knowledge.

The “wow” factor is important in choosing a topic for a feature article. I have tried to choose topics that would cause readers to say, “Wow, I never knew this technology was being used there!” The origami article (January, 2005, [html](#); [pdf](#)) was very popular, I believe, because it met this criterion. I have also tried to find examples of pattern recognition technologies that are well proven to provide benefit, and may be used in everyday life. The traffic engineering article (July, 2005, [html](#); [pdf](#)) is an example of this. We drive over

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Current *IAPR Newsletter* format:

This is the current structure of the *Newsletter*. Those items not described here are discussed in the article at right.

I welcome your suggestions on the format. Even more, I welcome your contributions.—Ed.

Feature Article

Calls for Papers contains a list of conferences and workshops with upcoming paper submission deadlines.

Inside the IAPR gives the IAPR membership some insight into what is happening behind the scenes and gives the author a forum by which to speak to the membership. The first article was by Linda O’Gorman who described the functions of the office of the IAPR Secretariat. Sargur Srihari (Publications & Publicity Committee chair) and Edward Sobczak (webmaster) recently wrote an article describing the new IAPR web site. In this issue, [Karl Tombre \(1st Vice President\) discusses IAPR Technical Committees](#).

Book Review

From the Executive Committee is written by the IAPR ExCo Secretary, Denis Laurendeau, and describes news events associated with the IAPR organization.

Can you help?

Technical Committee (TC) Articles are written periodically by the TC chairs. One of their goals in writing an article is to encourage new members to join the TC. One of my goals in publishing these articles is for the author to describe the state-of-the-art in the field. A recent article on [TC-12, Multimedia and Visual Information Systems](#), by Marcel Worring and Pietro Pala, described the progress of benchmarking in this field. Note that if you are a TC chair or involved in a TC that has not published an article recently, please consider contacting me to contribute an article

Conference and Workshop Reports

Letters to the Editor

Of Interest

[Comments on IAPR Newsletter format and content?](#)
[Contact the editor.](#)

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“electromagnetic loops” in roads (as evidenced by the rectangular cuts in the pavement) every day, but do we know how pattern recognition is involved in our daily commutes? Finally, I like articles that involve pattern recognition “heroes” who have persevered to bring their technology to use. It takes more than a good idea to make an impact, and I try to relate in the articles how most successes have involved short-term failures and other trials and tribulations that the principals endure and beat along the road to success. In this regard, I mention the article on pattern recognition in sports (April, 2003, [pdf only](#)). The researchers’ goal was to make tennis broadcasts more enjoyable by using pattern recognition techniques. Their path to ultimate success was like an up-and-coming tennis star who, first of all, plays the backcourts and sometimes loses, but eventually ends up triumphing at center court.

If you know of pattern recognition stories that you think would make a good feature article, please let me know.

Can You Help? – A second type of article in the *Newsletter* is entitled, “Can You Help?” There have been two of these. “Pattern Recognition in Designs of Archaeological Ceramic Sherds” (July, 2005, [html](#); [pdf](#)) and “Pattern Recognition in Cryptic Wildlife Species” (April, 2005, [html](#); [pdf](#)). The first

article describes a problem encountered on an archaeological dig in the southeastern United States. That is, to recognize and match the designs on broken portions of pottery. The second article describes a problem encountered by scientists studying cryptic cats in Costa Rica. They are trying to identify individual cats by their stripe patterns. In both cases, the scientists involved contacted the IAPR Secretariat hoping that there might be some way to match their problem with a pattern recognition researcher who either had a solution or was interested in developing one. In both cases, there have been matches made. I’m sure there are other requests that come to IAPR members. If you know of a problem in the pattern recognition domain whose story might make for interesting reading, please relate this to me.

BooksBooksBooks – Another type of article contains book reviews. A very popular article on Pattern Recognition Books (July, 2004, [pdf only](#)) surveyed a number of professors worldwide on which books they used and liked in this field. This issue has a review of a new book: *Kernel Methods for Pattern Analysis*.

I have two requests with respect to books: one for authors and one for reviewers. Authors, please contact me if you have

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recently published a book so that I can have the book reviewed in the *Newsletter*.

Prospective reviewers, if you see a new pattern recognition book that you'd like to review, and you have some experience in the field to be able to write an objective review, please let me know. Also, I receive books from publishers regularly. If you'd like to write a review on a pattern recognition book, or one in a related field, I might already have a book that I could send you for review. Let me know.

Conference and Workshop Reports – In each issue, we attempt to publish reports from all IAPR-sponsored conferences and workshops in the intervening period. I would ask conference and workshop chairpersons to designate authors and that these authors send a report to the *Newsletter* in a timely manner after the event. We try to include a photo as well with each published report. Furthermore, I request that the author endeavors to convey in the report something beyond the factual items of number of papers presented, etc. That is, I'd like to see these reports convey to people who could not attend the conference any news of novel developments in the field, exciting findings

presented, and/or the general direction of the field as indicated by people and presentations at the conference. This is a little more work than just describing the conference, but I believe it is much more interesting to readers and beneficial to the progress of the field.

Letters to the Editor – Please write! Once the *Newsletter* became electronic, space considerations were no longer an issue. The first published e-letter to the editor was from Richard Duda, regarding his book (with Peter Hart and David Stork) being named most popular pattern recognition book in the survey described above. The [letter in the current issue](#) gives some behind-the-scenes insight into the use of traffic cameras to “automatically” recognize cars for violations.

Of Interest – This is a bulletin board for which IAPR members are welcome to submit items. Recent postings have included post-doc positions, new publications, and discussion groups. Note that the *IAPR Newsletter* does not generally advertise non-IAPR events; the IAPR-sponsored events are published in the “Calls for Papers” section.

Be a part of your Newsletter—Contribute!

**Be a contributor to your
IAPR Newsletter!**

Do you have an idea for an article?

1. Send your idea for a feature article, a “Can you help?” or a book review to the editor. Or, volunteer to cover a conference or workshop or to write-up your Technical Committee's news.
2. On approval, write the article and submit it to the editor by the Newsletter deadline. The next one is: 25 Nov. '05.

Do you have some other observation or news of interest to the IAPR membership?

1. Email your letters and bulletin board announcements to the editor.

INSIDE the IAPR

IAPR Technical Committees (TCs)

[Karl Tombre](#)—IAPR 1st VP and General Chair of TCs



A major part of the scientific life of our association takes place in our technical committees, which cover a broad spectrum of scientific topics. A large number of our

TCs have either been newly created or revitalized, or have redefined their scope, goals and activities. Many have a mailing list or internal forum for their members to easily share information and to foster discussion. This is a good testimony to the vitality of this scientific life, and we encourage the membership at large to continue being involved in these activities. There is probably still room for new TCs on specific topics, provided a representative number of scientists from different member societies decide to work together on animating the community of their specific field.

Joining a TC is simple: no application forms to fill out.

Simply contact the TC through its web site or by sending mail to the TC chair.

But with this vitality, we also regularly receive questions about general guidelines for activities. The ExCo does not want to dictate or to inhibit groups from taking new initiatives. But for the sake of quality and visibility of our scientific

activities, we have discussed some basic guidelines which we have communicated to all our technical committees. Here is a summary of these guidelines.

Workshops and conferences

One of the most visible and sensible actions for a TC is to “sponsor” or “support” one or several scientific events. We are happy about the number and variety of events supported in that way. However, we wish to stress a few basic rules and guidelines:

- ◆ It is not enough to claim that a TC sponsors an event; it should be submitted to the IAPR Conferences and Meetings Committee for official approval and [sponsorship](#), as specified in the IAPR guidelines.
- ◆ The purpose of sponsorship of an event by an IAPR TC is to foster scientific exchanges in the area of expertise of that TC. We have a number of TC chairs or members who are dynamic personalities within the pattern recognition community; and as such, they are also often involved in the organization of general purpose conferences and workshops. It is not because a TC chair or member is strongly

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involved in organizing such an event that the TC should necessarily “sponsor” the event. In many cases, the event may directly apply for IAPR sponsorship, without going through the TC. It is important to maintain a clear visibility of our TCs’ work independently of the personalities or other duties of the TC chairs or members.

- ◆ In any case, IAPR-sponsored events in general, and TC workshops in particular, should not “compete” with each other but rather have complementary roles. This is especially true for workshops organized in close connection with our main events, first and foremost ICPR, but also ICDAR. Any satellite workshops should not be perceived as alternatives or competitors to the main conference but should give some additional and complementary benefit to people attending both.
- ◆ All our TCs are general IAPR committees and, as such, are broadly international. This should be reflected by an international program committee and by moving the venue from one country, and ideally from one continent, to another. The fact that TC events remain for long periods in the same area of the world may reflect a lack of international involvement within the TC.

Web presence and educational material

Most of our TCs have web sites and many of them are working on improvements of these web sites. This is a very good initiative. The ExCo very much wants to support this. We are pleased to announce that as we are working on improving the professional web services provided to our membership and to our technical committees, we can provide a web name under the *iapr.org* umbrella and even web hosting space. Thus, the TCs do not need to reserve their own domain names and work on their own hosting solutions. Interested TCs can contact [Prof. Srihari](#), head of the Publications and Publicity Committee, who is leading the work in setting up professional web services and has plans to provide a template for describing each TC homogeneously.

Under the chairmanship of [Dr. Antonacopoulos](#), the Education Committee currently has a very ambitious plan to put together educational material on various pattern recognition topics, and they are looking for experts to write on various subjects. As the expertise is very often to be found in the TCs, we strongly encourage TCs to synchronize their work with that of the Education Committee. We feel that everybody will win if we work on this together and not each

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TC on its own. We therefore see the Education Committee as some sort of moderator or assembler, with contributions coming (among others) from the TCs.

Performance evaluation and datasets

A number of TCs work on performance evaluation and reference datasets. This is also a very interesting and appropriate action. We just want to point out that IAPR TC5 is devoted to the general methodology of benchmarking and software, so we invite all TCs to keep communication lines open with TC5, to let this TC know about your ongoing efforts and to share with TC5 and thus with the IAPR community at large the methodological tools you may use. We are of course aware of the fact that a number of details are very specific to each field and thus more appropriate for work at the TC level, but it is our common interest to share as much as possible, and we would like to keep a good awareness within the association on these activities in general, and TC5 is a good vector for these purposes.

IAPR Technical Committees

TC1 [*Statistical Pattern Recognition Techniques*](#) Professor [Fabio Roli](#)

TC2 [*Structural & Syntactical Pattern Recognition*](#)
Professor [Ana Fred](#)

TC3 [*Neural Networks & Computational Intelligence*](#)
Dr [Simone Marinai](#)

TC4

TC5 [*Benchmarking & Software*](#)
Dr [Simon Lucas](#)

TC6 [*Special Hardware and Software Environments*](#)
Dr [Markus Vincze](#)

TC7 [*Remote Sensing and Mapping*](#)
Dr [David Clausi](#)

TC8 [*Machine Vision Applications*](#)
Professor [Katsushi Ikeuchi](#)

TC9 [*Biomedical Applications*](#)
Professor [Franjo Pernus](#)

TC10 [*Graphics Recognition*](#)
Dr [Josep Lladós](#)

TC11 [*Reading Systems*](#)
Dr [Jianying Hu](#)

TC12 [*Multimedia and Visual Information Systems*](#)
Dr [Marcel Worring](#)

TC13 [*Pattern Recognition in Astronomy & Astrophysics*](#)
Dr [Tin Kam Ho](#)

TC14 [*Signal Analysis for Machine Intelligence*](#) Professor [Tieniu Tan](#)

TC15 [*Graph Based Representations*](#)
Professor [Mario Vento](#)

TC16 [*Algebraic and Discrete Mathematical Techniques in Pattern Recognition & Image Analysis*](#)
Dr [Igor Gourevich](#)

TC17 [*Machine Learning and Data Mining*](#)
Professor [Atsushi Imiya](#)

TC18 [*Discrete Geometry*](#)
Professor [Annick Montanvert](#)

TC19 [*Computer Vision for Cultural Heritage Applications*](#)
Dr [Robert Sablatnig](#)

TC20 [*Pattern Recognition for Bioinformatics*](#)
Professor [Raj Acharya](#)

News from the IAPR EXECUTIVE COMMITTEE

By [Denis Laurendeau](#)

The ExCo met on June 5-6, 2005, in Estoril, Portugal, before the 2nd Iberian Conference on Pattern Recognition and Image Analysis. Many topics were on the agenda, and a brief overview of the issues that were discussed is given in this column.

The question of membership lists, which had been raised at the last GB meeting in Cambridge, was discussed. It is important to point out that the membership lists are used by the IAPR Secretariat to estimate the annual dues that member societies must pay to the IAPR. The number of votes of a member society on the GB also depends on the number of members on the lists. As reported later in this column, membership lists will become even more important, since it is planned to provide more e-services to IAPR members in the future, and the access to the IAPR web site will need to be controlled in some way through membership lists. Although a final solution was not found during the ExCo meeting, a few potential solutions were proposed and will be refined in the coming months.

The Treasurer, Maria Petrou, informed the ExCo that the financial status of the IAPR is even better than what was reported at the last GB meeting in Cambridge. The issues

related to transfer of bank accounts and tax reports have been resolved. This should facilitate the management of IAPR's finances in the future since most operations will be done electronically.

TC Chairs and Standing Committee Chairs were asked to submit an intermediate report to the ExCo with respect to the activities that have taken place since the last GB meeting and the plans for the next year. A majority of TCs have been active and many are planning to maintain this level of activity in the year to come. It is relevant to note that many TCs have started or plan to start offering more web-based services to their members. In addition, many TCs also plan to add educational material to their respective websites. Since a significant amount of educational material that is relevant to the TCs can be of interest to the IAPR community at large, the First Vice-President, Karl Tombre, has contacted TC chairs and has advised them to coordinate the publication of this material with the Chair of the Education Committee, A. Antonocopoulos, and the Chair of the Publications and Publicity (P&P) Committee, S. Srihari ([see related article in this issue](#)).

In this context, the Chair of the P&P Commit-

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tee has contacted providers of professional web services in order to estimate the cost of offering more services to IAPR members through the IAPR website. The IAPR community will be informed of the developments on this topic in the coming issues of the *Newsletter*. Speaking of web services, the P&P Committee has reported that the transition from paper format to e-format of the newsletter was smooth, with only minor problems encountered during the transition phase. During his tenure, the Editor of the *Newsletter*, Larry O’Gorman, has expanded the *Newsletter* by including a regular book review section, a column called “Inside the IAPR”, feature articles on pattern recognition, TC articles, etc. Larry counts on the participation of IAPR members to contribute actively to the *Newsletter* by submitting articles, short reports, and any information that is of interest for IAPR members ([see Feature Article in this issue](#)).

The President, Walter Kropatsch, has been discussing the renewal of the agreement with Elsevier, and the discussion will continue through e-mail in the coming weeks. The agreement, in addition to maintaining current services that are of interest to the IAPR community, will take into account the objective of offering more web-based services to IAPR members.

The K.S. Fu Committee has prepared the nomination and endorsement forms for the 2006 Prize. The forms are available on the IAPR website www.iapr.org/awards/kingsunfu.php). Please note that the completed forms must be received by the Chair of the K.S. Fu Committee, **Prof. J.K. Aggarwal**, no later than **January 15, 2006**.

The Conferences and Meetings (C&M) Committee reports that a significant number of applications have been submitted to the Chair of the Committee, Larry Spitz, since the last GB meeting in Cambridge. In addition to reviewing the applications, the C&M Committee, along with the IAPR Task Force on ICPR, has continued monitoring the progress that has been made in the preparation of ICPR 2006 in Hong Kong. With respect to ICPR 2006, the ExCo recommends that the number of travel stipends be increased and that the value of the stipends be increased from \$500 US to \$700 US. The ExCo also recommends that a prize for best paper be awarded for each track of ICPR 2006. Finally, The new sponsorship categories for conferences and meetings, which were approved by a GB ballot, were briefly discussed at the meeting in Estoril, and the C&M Committee was informed that the new categories should be enforced. The web page will be updated to reflect these changes.

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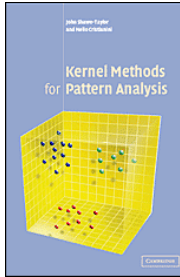
Speaking of ICPR, the General Chair of ICPR 2008, Rangachar Kasturi, presented a progress report on the organization of the conference. Overall, the organization of the conference is going very well, and agreements have been signed with the Convention Center and several hotels. Future actions will concentrate on planning pre/post-conference activities, entertainment, network connectivity, sponsorship/exhibits and other budgetary issues such as cost of poster boards, catering, etc.

With respect to the activities of the Fellow Committee, the nomination forms for IAPR Fellows to be nominated in 2006 have been posted on the web site (www.iapr.org/fellows/cfn.php). Nominations must be received in hardcopy form before the deadline of **February 1, 2006** by the Chairperson of the Fellow Committee, **Dr. Gabriella Sanniti di Baja**.

The President, Walter Kropatsch, has recommended that the GB be asked to approve the creation of a permanent Advisory Committee to be composed of senior IAPR members who demonstrate interest in being in-

involved in IAPR matters. The guidelines for nominating committee members will be prepared and submitted to the GB for discussion.

Let me end this column on a very positive note. A few weeks before the Estoril meeting, the President, Walter Kropatsch, was approached by Professor Anil Jain to set up a new prize acknowledging the work of young scientists. The ExCo considered this proposal and agreed to explore this idea further. Professor Jain informed the ExCo that the students, friends and family of Professor J.K. Aggarwal, in recognition of his long standing contributions to our profession as well as to IAPR, propose to set up this new IAPR prize to recognize outstanding young researchers (under the age of 40) in the IAPR community. It was recommended that the prize be called the "J.K. Aggarwal Prize" and that the first prize be awarded at the next ICPR in Hong Kong in 2006. The group of donators is willing to commit \$50,000 US to set up the prize. The ExCo, after discussing the opportunity of creating the new prize, has agreed to submit the proposal to the GB and a GB ballot has been initiated on this topic. The result of the vote will be known by October 15, 2005.



Kernel Methods for Pattern Analysis

By John Shawe-Taylor and Nello Cristianini

Cambridge University Press, 2004

Reviewed by: Salil Prabhakar, Digital Persona Inc.

salilp@digitalpersona.com

Many qualities of this book stand out even before one begins to read it. The book is framed in a more general context than are books on Support Vector Machines. It not only covers kernel pattern classification and regression (a topic covered at length in SVM books) but also kernel principal components analysis, canonical correlation analysis, ranking, clustering, multidimensional scaling, and other pattern analysis methods. Basic theoretical concepts (in Part I), pattern analysis algorithms (in Part II), and various types of kernels (in Part III) are all presented in this large unifying framework of kernel methods. The methods described are applicable to a very large variety of application domains (e.g., bioinformatics, biometrics, data mining, document analysis, information retrieval, machine vision, text categorization, and robotics, to just name a few). Further, many of the algorithms and kernels presented in Parts II and III are accompanied by Matlab code or pseudocode, which would be welcomed by practitioners in bridging the gap between understanding of the theoretical framework and writing a correct implementation.

achieving data compression and prediction by finding relations (exact, approximate, or statistical) in the data are introduced in Chapter 1. A toy example demonstrates the concept of transforming the representation of a pattern by changing the coordinate system, a concept that is central to kernel systems. Many definitions, terminology, mathematical notation that will be used throughout the book are introduced here together with basic pattern recognition concepts such as generalization, over-fitting, supervised learning, unsupervised learning, etc. Chapter 2 provides an introduction to the general framework of kernel methods. Raw data is embedded into (higher dimensional) feature space and linear relations are learned in the (higher dimensional) feature space (often by solving an optimization problem). Only pairwise inner products between data items are needed (obtained by kernel functions), thus providing computational efficiency. These concepts are illustrated using a toy linear regression example. Overview/organization of the rest of the book is introduced to the reader as a walk-through. Chapter 3 describes the theoretical properties of kernels

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The basic concepts of pattern analysis

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(including some review of the involved linear algebra) in a general framework (without regard to any specific kernel type or pattern analysis algorithm). Part I of the book concludes with Chapter 4, where a framework for understanding how kernels' statistical stability can be controlled is developed.

While readers whose first exposure to kernel methods is this book will find Part I of the book useful, most practitioners could go directly to Part II that deals with pattern analysis algorithms and/or Part III that deals with types of kernels. Chapter 5 prepares the reader for the rest of the chapters (6,7, and 8) in Part II by introducing basic tools (e.g., mean, distances, projections, variance, etc.) for analyzing data in a kernel-defined feature space. Chapter 6, pattern analysis using eigen-decomposition, covers kernel Principal Components Analysis (PCA), kernel Partial Least Squares (PLS), and kernel Canonical Correlation Analysis (CCA). Primal PCA, PLS, and CCA are also described in brief for reference and completeness. Kernel PCA, PLS, and CCA are fairly new techniques and have become hugely popular in the community due to providing better accuracy in learning tasks as compared to linear algorithms (this is not surprising since most real world data cannot be described using linear relations). Kernel methods can also often deal better with very high dimensional input data.

Chapter 7 covers support vector machine classification and support vector regression algorithms as well as novelty detectors and ridge regression. These algorithms result from optimization problems; optimization of the desired criteria is cast in the framework of convex optimization. Development of simple linearly separable classification and regression cases are followed by more complex soft margin cases for non-separable data. The authors also present on-line (incremental) learning versions of the batch algorithms. On-line/incremental learning algorithms are desired by a number of practical applications. Interestingly the generalization bound for on-line algorithms is at least as good as the margin bound obtained for the hard margin SVM (although in practice, batch SVM typically gives better generalization). Kernel-based rank learning and kernel-based clustering algorithms are considered in Chapter 8. Batch and on-line versions of the kernel-based ranking algorithms are considered as well as kernel-based, k-means, and spectral clustering algorithms. Kernel Multi-Dimensional Scaling (MDS) is considered in a section dedicated to kernel methods for data visualization.

Part III of the book consists of chapters 9, 10, 11, and 12 that are devoted to the design of a wide range of kernel functions. Simple polynomial kernels, popular infinite-

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dimensional Gaussian kernels, ANOVA kernels and computational considerations are covered in Chapter 9. Description of ANOVA kernels is particularly interesting, since this is the first example of kernels defined by means of a recursive relation and efficiently evaluated using dynamic programming. Different types of data domains require different kernels attuned to the data type/domain. Kernels from graph, diffusion kernels on graph nodes, kernels on sets, kernels on real numbers, and randomized kernels are covered in Chapter 9. Chapter 10 is dedicated to kernels for text data types (e.g., in information retrieval applications). The discussion of Vector Space Model (VSM), also called 'bag-of-words' (where a document is represented by the unordered set of constituent words and the frequency of their occurrence) is interesting, since the vector representation can have tens of thousands of entries/dimension (often more than the number of training examples) but is extremely sparse (only few entries are non-zero). The chapter discusses vector space kernels as well as its refinements that take semantics into account. Kernels for structured data such as strings and trees (e.g., in applications such as bioinformatics) are covered in Chapter 11. A kernel that sums the number of common substrings/subsequences can be used to compare strings and can be efficiently imple-

mented using dynamic programming. Kernels for trees are similar to kernels for strings as both exploit recursive structure (of strings and trees, respectively) using dynamic programming. Chapter 12 examines how probability of co-occurrence or Fisher kernel construct can be used to create kernels from generative models of data. Fixed length Hidden Markov Model (HMM) kernel, pair HMM kernel, hidden tree model kernel, and fixed length Markov model Fisher kernel are discussed here.

Overall I enjoyed reading this book and am happy about its addition to my library as it is a valuable practitioner's reference. I especially liked the presentation of kernel-based pattern analysis algorithms in terse mathematical steps clearly identifying input data, output data, and steps of the process. The accompanying Matlab code or pseudocode is also extremely useful. I would have liked to see more toy examples with figures depicting not only the results of straightforward implementation of kernel pattern analysis algorithms but also illustrating the effects of different kernels/parameters, over-fitting and regularization. A section on authors' expert suggestions to practitioners on the choice of kernel type, kernel parameters, learning algorithm parameters, and data normalization would also have been welcomed by practitioners.

Call for Papers: ICPR 2006



ICPR 2006 will be held at the [Hong Kong Convention and Exhibition Center](#)

Important Dates:

Deadline for paper submission:	15 Dec. 2005
Deadline for tutorial submission:	15 Jan. 2006
Notification of acceptance	15 Mar. 2006
Camera-ready papers:	15 May 2006
Author registration:	15 May 2006
End of early bird registration period:	30 May 2006

ICPR 2006 Contact Information:

ICPR06 Secretary
Email: icpr06@comp.hkbu.edu.hk

The major event in the IAPR calendar is the biennial International Conference on Pattern Recognition (ICPR), which attracts scientists, researchers, and practitioners in the field from all over the world. Here they are able to listen, to learn, to educate, and to exchange ideas with their colleagues.

ICPR 2006 will take place in Hong Kong and will consist of 5 tracks:

Computer Vision and Image Analysis

Pattern Recognition and Basic Technologies

Signal, Speech and Image Processing

Systems, Robotics and Applications (with Associated Theme : Biometrics)

Cognitive Approaches & Soft Computing



The Venue

The award-winning, multi purpose-built [Hong Kong Convention and Exhibition Centre](#) is larger than any in Asia outside Japan - five exhibition halls, two ballroom-style convention halls, two world-class theatres, 52 variously sized meeting rooms, two large foyers for pre-function gatherings plus supporting amenities.

See you in Hong Kong!

Call for Nominees

King-Sun Fu Prize

Past winners of the

K-S Fu Prize:

Professor Azriel Rosenfeld
1988 Rome

Professor R.L. Kashyap
1990 Atlantic City

Professor Levin Kanal
1992 The Hague

Professor Herbert Freeman
1994 Jerusalem

Professor Teuvo Kohonen
1996 Vienna

Professor [Jean-Claude Simon](#)
1998 Brisbane

Professor [Theo Pavlidis](#)
2000 Barcelona

Professor [Thomas S. Huang](#)
2002 Quebec City

Professor [J. K. Aggarwal](#)
2004 Cambridge

The International Association for Pattern Recognition (IAPR) is pleased to announce a call for nominations for the King-Sun Fu Prize in honor of the memory of Professor King-Sun Fu.

Professor Fu was instrumental in the founding of IAPR, served as its first president, and is widely recognized for his extensive contributions to the field of pattern recognition.

This biennial prize is given to a living person in the recognition of an outstanding technical contribution to the field of pattern recognition, and consists of a cash amount and a suitably inscribed certificate. The prize is derived from interest income from a special fund set up for this purpose.

The prize recipient shall be selected by the Prize Committee, subject to approval by the IAPR Governing Board, upon nomination by a member of a national member society of IAPR and by endorsement of at least five members, representing at least two member societies different from that of the nominators.

Members of the IAPR Executive Committee, as well as of the Award Committee, shall be ineligible for the prize and may not serve as nominators or endorsers.

The 2006 prize will be presented at the

International Conference on Pattern Recognition (ICPR)

Hong Kong
20-24 August 2006

The nomination must be made on a [special nomination and the endorsement forms](#) (in the MS Word format), and must be received by the Award Committee Chairman no later than **15 January 2006**. Both completed and signed nomination and endorsement forms must be submitted in the paper form (no electronic submission). The nominator as well as endorsers should mail their completed forms directly to the chairman of the Prize Committee:

Prof. J. K. Aggarwal, Chair K-S. Fu Prize Committee
Department of Electrical and Computer Engineering,
The University of Texas at Austin,
1 University Station C0803
Austin, Texas, USA 78712-0240
email: aggarwaljk@mail.utexas.edu

A report on MVA 2005 appeared in the previous issue of the IAPR Newsletter (html: [MVA 2005](#), pdf: [MVA2005](#)); however, we failed to include accompanying photos.

Photos are included here, with apologies. - Ed

9th IAPR Conference on Machine Vision Applications

16-18 May, 2005, Tsukuba Science City, Japan

www.cvl.iis.u-tokyo.ac.jp/mva/



Opening speech by Dr Sakaue (left); poster session (right).



Invited talks by Prof. Waibel, Prof. Sandini and Prof. Otsu (left to right).



Presentation of the Most Influential Paper over the Decade Award by Prof. Takagi to the awardees: Prof. Ando, Prof. Maki and Dr. Nagasaka (left to right).



Banquet: toast by Prof. Kweon and speech by Prof. Kuno.

Conference Report: [PRIP 2005](#)

Chair: Rauf Sadykhov

Eighth International Conference on Pattern Recognition and Information Processing

18-20 May 2005, Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus

Report Prepared by: Rauf Sadykhov

More than 160 papers from 30 countries were submitted for PRIP 2005. After a thorough review by the Program Committee and attached qualified reviewers, 118 papers were selected. The papers were separated into 9 sections, including signal processing, data analysis, image processing, image classification, pattern recognition, 3D image processing and modeling, decision support systems, system and parallel architectures for signal and image processing, application of computer vision systems.



There were 3 keynote speakers at PRIP 2005: Prof. B. John Oommen, School of Computer Science, Carleton University, Canada, Fellow of the IEEE; Prof. Qiangfu Zhao, University of Aizu, Japan; and Prof. Maria Petrou, School of Electronics and Physical Sciences, Centre for Vision, Speech and Signal Processing, University of Surrey, Guildford, United Kingdom.

Prof. Oommen proposed a new model pattern recognition that involved Chaotic Neural Networks as an alternative traditional pattern recognition systems with a model where an object to be recognized is characterized by a set of features. To achieve this he enhanced the basic Adachi model referred to as Adachi's Neural Network, which is dynamic but not chaotic.

Very interesting information was represented by Prof Zhao in the report "Lifetime Learning with Neural Network Trees". He proposed new algorithms for lifetime learning. The efficiency of the algorithms is validated through experiments with several public databases.

Prof. Petrou considered complex problems to create computer vision systems and some biologically inspired approaches to image processing.

The main aim of the Conference was to bring together researchers from all over the world dealing with image and signal processing and pattern recognition to discuss the recent status of research and to direct further developments to create computer vision systems. The Conference was very successful.

Workshop Report: [MCS2005](#)

Workshop Chairs:

Nikunj C. Oza (NASA Ames Research Center, USA)
Robi Polikar (Rowan University, USA)
Josef Kittler (University of Surrey, UK)
Fabio Roli (University of Cagliari, Italy)

Sixth International Workshop on Multiple Classifier Systems

www.diee.unica.it/mcs

13-15 June, 2005, Seaside, CA, USA
Report prepared by: [Larry Hall](#)

The International Workshop on Multiple Classifier Systems is a conference series whose goal is the development of the theories, algorithms, and applications of ensemble machine learning methods. The series, which began in 2000, was spawned by the theoretical and empirical successes of ensemble methods especially in the 1990s. This workshop has served as a forum for researchers working in this area to spend some focused time presenting and discussing recent advances and issues. The sixth workshop was held just outside of Monterey California a block from the Pacific Ocean. The location encouraged interaction enabling, for example, a large ensemble to walk through the cool California evening to an excellent fish restaurant for informal discussions of multiple classifiers.

The workshop contained a mixture of theoretical presentations and presentations of applications. The workshop began with an interesting presentation by Hillol Kargupta on orthogonal decision trees. By treating decision trees as functions, his group has been able to create an orthogonal set of trees after some transformations resulting in high accuracy ensembles. There were several interesting presentations about how multiple classifiers work. In particular, analyses of variance reduction was focused on as part of this explanation. There were presentations discussing the utilization of multiple classifiers in an incremental learning context where new classes could occur. On the final day of the meeting, there were two talks on new research directions. Fabio Roli made a nice presentation on semi supervised multiple classifiers systems in which both labeled and unlabeled data are used. This is a niche which deserves exploration because of the well understood difficulties in getting as much labeled data as one would like. Kagan Tumer discussed a sys-

tem of agents which has an overall system-level objective where each individual agent has its own goal. This is a potential multi-classifier system, but the potential autonomy of agents provides a different type of focus.

As is the tradition, there was a roundtable discussion led by Terry Windeatt and Philip Kegelmeyer. Three areas, performance claims, design and data principles, and the future of the field were discussed in an interesting way. Attendees submitted claims or predictions which were then discussed. After discussion, a collective vote was taken resulting in a type of multi-classifier system prediction. There was general agreement that diversity among classifiers was important and that multiple classifiers systems held promise for incremental learning. There was some agreement that it may be possible to analyze a data set to determine the best type of multiple classifier system to apply. There was a general consensus that there is yet room for improving multiple classifiers systems.

The talks and discussions at the workshop allowed attendees to have an in-depth view of work that has been recently done in the field of ensemble learning or multiple classifier systems. They also suggested new threads of research to follow and established threads that require more work. Details on the next MCS will be available at: www.diee.unica.it/mcs. These focused workshops are highly valuable for people interested in multi-classifier systems and the next one will continue the tradition.

Proceedings from MCS2005
are available in the [Springer
Lecture Notes in Computer
Science Series, Volume 3541](#)

Workshop Report: [GREC2005](#)

General Chair: [Liu Wenyin](#)

Program Co-chair: Josep Lladós

Sixth IAPR International Workshop on Graphics Recognition

City University of Hong Kong, HKSAR, China

25-26 August, 2005

Report prepared by: [Liu Wenyin](#)



The IAPR International Graphics Recognition Workshop (GREC) is the main activity of the IAPR TC10 (www.cvc.uab.es/iapr-tc10/). The sixth edition (GREC2005) was held in the City University of Hong Kong, August 25-26, 2005 and chaired by Liu Wenyin and Josep Lladós. 70 papers were received (36 papers accepted in the final scientific program). 45 registered participants from 13 countries and some local students attended the workshop.

Following the tradition of the previous workshops in the series, the scientific program was organized in a single-track 2-day workshop. It comprised six sessions dedicated to specific topics. For each session, there was an overview talk, followed by a number of short presentations. Each session was concluded by a panel discussion. Session topics included Engineering Drawings Vectorization and Recognition, Symbol Recognition, Graphic Image Analysis, Structural Document Analysis, Sketching and On-Line Graphics Recognition, and Curve and Shape Processing. In addition, a special session panel discussion was dedicated to (this year is) the tenth anniversary of GREC. This session presented a summary of the achievements of GREC in the previous ten years and the planning of GREC in the next ten years. Another session

was arranged for reports of contests and discussion. Selected papers of GREC2005 will be published in a book of Springer LNCS series.

Two contests were held during GREC2005. The third [arc segmentation contest](#) was organized by Liu Wenyin and attracted 3 participants. Dr. Xavier Hilaire, from LORIA - Université Henri Poincaré, France, won the arc segmentation contest. The second [symbol recognition contest](#) was organized by Ernest Valveny and Philippe Dosch and had 4 participants. Mr. Feng Ming Feng, a MPhil student from the City University of Hong Kong, won the symbol recognition contest. The contests were a big success, and the inclusion of them has become a key issue in GREC workshops. Contests are useful not only to evaluate the state-of-the-art on algorithms related to different problems in graphics recognition, but also to provide evaluation databases to the community. This time, all the material used in the contests was distributed in a CD among GREC2005 delegates and is also available at the websites of the contests.

The social program consisted of a traditional Chinese food banquet and a day-long city tour of major attraction points of Hong Kong. Both were well appreciated by the attendees.

During GREC2005, we continued to discuss the future editions of GREC workshops in the aspects of the length and format of the Workshop, the relation with ICDAR, the collaboration with other close communities, etc. Especially, since the [ICDAR 2007](#) will be held in Brazil, these issues become urgent and should be settled down in the near future by TC10 chair and members such that we can prepare GREC2007 soon.

Workshop Report: [NNLDAR05](#)

Co-Chairs:
Simone Marinai
Hiromichi Fujisawa

First IAPR TC3 Workshop on Neural Networks and Learning In Document Analysis and Recognition

29 August, 2005, Seoul, Korea

Report prepared by: [Cheng-Lin Liu](#)

The First IAPR TC3 Workshop on Neural Networks and Learning in Document Analysis and Recognition (NNLDAR05) was held in conjunction with the Eighth International Conference on Document Analysis and Recognition (ICDAR). NNLDAR05 was co-sponsored by IAPR TC3 Neural Networks and Computational Intelligence (www.ds.unifi.it/TC3/), the University of Florence (Italy), and Hitachi Ltd. (Japan). Dr. Simone Marinai and Dr. Hiromichi Fujisawa served as co-chairs, and a number of active researchers joined the program committee.

The background of NNLDAR05 is the widespread and successful applications of artificial neural networks (ANNs) and machine learning paradigms in document analysis. ANNs have been applied to all the processing steps of document analysis, including image pre-processing, layout segmentation, text area classification, character segmentation, word and string recognition, and character classification. The great success of ANNs is attributed to their flexible learning capability from examples. The aim of NNLDAR05 was to provide a forum for discussing the start-of-the-art, existing problems, and potential improvements and new applications of neural networks and learning paradigms in document analysis.

The program of NNLDAR05 included seven oral presentations and one demonstration session. About 30 participants attended the sessions and actively participated in discussions. The topics of presentations covered the review of methods, data pre-processing and selection for improving generalization or learning speed, and improving rejection. In addition, applications of learning methods to segmentation, document retrieval, and text classi-

fication were proposed. Each presentation was assigned 30 minutes, including 20 minutes for speaking and 10 minutes for questions and discussions. The demonstration session showed a complete document understanding system incorporating machine learning techniques in many steps.

The discussions at NNLDAR05 were really stimulating. Issues included the benchmarking of learning and recognition methods, reliable rejection, and potential new applications. Particularly, the urgent need of common datasets, especially large-scale and difficult-to-recognize ones, was raised. The recognition rate on the widely used MNIST handwritten digit dataset is already very high, but it was remarked that details of errors are required for analysis and comparison. Error reduction via reliable rejection was considered to have received much less attention than improving recognition rate. Hence, moving the objective from a high correct rate to low error and reject rates was emphasized. Other discussed topics concerned the comparison between ANNs and support vector machines (SVMs), improving recognition performance via utilizing new learning schemes, combining different learning methods, incorporating human knowledge, and so on. The discussions at NNLDAR05 thus encouraged the continuation of this forum.

The proceedings of NNLDAR05 are available online at the workshop homepage: www.dsi.unifi.it/NNLDAR

Conference Report: ICIAP 2005

General Chair: Fabio Roli

Program Co-chair: Sergio Vitulano

13th International Conference on Image Analysis and Processing 6-8 September, 2005, Cagliari, Sardinia, Italy

Report Prepared by: Francesco Tortorella

The 13th edition of the International Conference on Image Analysis and Processing (ICIAP) was held in Cagliari, the chief town of Sardinia, Italy. It was organized by the Department of Electrical and Electronic Engineering of the University of Cagliari and chaired by Fabio Roli and Sergio Vitulano.

The conference is organized every two years by the Italian group of researchers affiliated with IAPR ([GIRPR](#)) with the aim of bringing together researchers in image processing and pattern recognition from around the world. The central theme of ICIAP 2005 was *Pattern Recognition in the Internet and Mobile Communications Era*, and main conference topics concerned the theory of image analysis and processing and its classical and internet-driven applications.

About 150 researchers from several countries attended the conference. A total of 143 high-quality papers were presented, selected by the program committee from 217 submissions. Fifteen papers were collected by the two special sessions dealing with *Pattern Recognition for Computer Network Security* and *Computer Vision for Augmented Reality and Augmented Environments*.

The central theme of the conference was addressed directly by two of the invited talks. In “Biometric Recognition: How Do I Know Who You Are?” Anil K. Jain illustrated strengths and weak points of current biometric systems and showed how multiple biometric modalities can alleviate some of the problems faced by unimodal biometric systems. In his talk “Interactive, Mobile, Distributed pattern Recognition”, George Nagy described some inter-



active classification systems, in which humans and machines take turns to reach a decision that assigns a particular object to a particular class. This methodology was particularly effective in the recognition of natural patterns performed on mobile devices, such as pocket computers, possibly connected on a wireless network.

The other invited talks, even if not strictly focused on Internet and Mobile Communications, were nevertheless very stimulating and covered areas of Business (Giovanni Garibotto, “How to Make Business with Computer Vision Technology”), Cognitive Vision (Josef Kittler, “Unsupervised Symbol Grounding and Cognitive Bootstrapping in Cognitive Vision”), and Shape-From-Shading (Edwin Hancock, “Single View Face Reconstruction Using Shape-From-Shading”).

As for the previous editions, the best paper by a young author was selected by an international committee. The award, which honours the memory of Prof. Edoardo R. Caianiello, went to Eric Dahai Cheng for the paper “Track Matching by Major Color Histograms Matching and Post-matching Integration”, co-authored with Massimo Piccardi.

The social events were most enjoyable, including tours of the old town centre of Cagliari. The conference banquet was excellent and in the tradition of the warm Sardinian welcome.

Proceedings from ICIAP2005 are available in the Springer Lecture Notes in Computer Science Series, Volume 3617. The next ICIAP will be organized by Rita Cucchiara and will be held in Modena in September, 2007.

Letters to the Editor

The article referred to in this letter was the “Pattern Recognition in Traffic Engineering” feature that appeared in the July 2005 issue of the *IAPR Newsletter*



7/12/2005 11:03 AM

Dear Larry,

I enjoyed your feature article in this month's issue of the *IAPR Newsletter*— thank you. I have been working on automatic number plate recognition (ANPR) for the last four years with one of the UK's leading providers of traffic monitoring equipment.

FYI, it is a well-known trade secret that the London congestion charging scheme does not actually use ANPR. Instead, they have large banks of human operators who watch the images and type in the plate numbers manually. Laborious and time-consuming, but very effective, as your congestion ticket indicates!

There are a number of commercial ANPR systems that achieve very high accuracies, up to 99% or more in some situations. Others vary between 50% and 90% and are used very successfully in a number of toll, employee car-parking, traffic-flow monitoring and other applications.

For a high-risk and high-profile new scheme in a sensitive place such as London, the decision-makers seem to have opted for a method they can fully trust rather than technology that may have been prone to error, however slight, since the last thing they wanted was erroneous tickets through the front doors of the British public! With the manual method, it would seem that they employ double- or triple-checking of the data, of course.

Yours sincerely,

Usama Hasan

Of interest...

Positions

2 CHAIRS (Full Professor) AND 2 LECTURESHIPS (Asst. Professor) in SIGNAL AND IMAGE PROCESSING UNIVERSITIES OF HERIOT-WATT AND EDINBURGH

Supported by an investment of £22M including £11.77M from the OST and SHEFC, the University of Edinburgh and Heriot-Watt University have created the Edinburgh Research Partnership (ERP) in Engineering and Mathematics. The ERP will encompass five jointly owned research institutes and an associated joint postgraduate school.

The key appointments are for staff who are capable of addressing key research challenges in signal and image processing (in which we would include computer vision) such as:

- * non-linear and non-Gaussian signal processing;
- * signal/image communication and processing;
- * 2D, 3D imaging, interpretation and beyond;
- * object/target/signal recognition, classification and identification;
- * image-world interaction: autonomous navigation, visual servoing, monitoring and surveillance;
- * distributed sensing networks
- * signal and image processing for human perception

For details of the posts, informal enquiries and application procedures see www.erp.ac.uk/vacancies/index.htm

For descriptions of current group research activities, see

- * the University of Edinburgh (Engineering): www.see.ed.ac.uk/research/IDCOM/
 - * Heriot-Watt University (Computer Science): www.cce.hw.ac.uk/Research/index.html
- (Andrew Wallace, Heriot-Watt University)

Publications

CALL FOR PAPERS

*** * * Please note: dates have changed * * ***

Biometrics: Progress and Directions

IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)
Special Issue
July Issue of 2007

DEADLINE: February 1, 2006

For information see:

www.computer.org/portal/cms_docs_transactions/transactions/tpami/CFP/TPAMI_Biometrics_CFP_v2.pdf