

# IAPR Newsletter

Volume 31, Number 1  
January 2009

## ICPR 2008 Special Issue



The International Conference on Pattern Recognition (ICPR) is the major scientific event organized under the auspices of the International Association for Pattern Recognition (IAPR).

This Special Issue of the *IAPR Newsletter* highlights the Invited Talks from the 19th International Conference on Pattern Recognition (ICPR 2008) held in Tampa, Florida, on 7-11 December 2008.

**\*\*\* Calls for Papers on Page 2 \*\*\***

### In this issue...

[ICPR 2008 Highlights](#).....Page 3  
Reviews of the eight invited talks presented at ICPR2008, which was held in Tampa, Florida, USA, plus a list of best paper award winners and new IAPR Fellows.

[From the ExCo](#).....Page 17  
As the first column in his second term as IAPR Secretary, Denis Laurendeau shares the IAPR news from ICPR 2008.

[INSIDE the IAPR: Hello from the new editor of the IAPR Newsletter](#).....Page 19  
Alexandra Branzan Albu, the new editor of the *IAPR Newsletter*, introduces herself and issues an invitation to the IAPR community to become involved in the *Newsletter*.

[Conference and Workshop Reports: CIARP 2007 12th Iberoamerican Congress on Pattern Recognition](#) .....Page 20

[DAS 2008 8th IAPR International Workshop on Document Analysis Systems](#) .....Page 21

[Of Interest..](#).....Page 24  
A free book offer and a call for chapters/papers for a proposed book.

[Conference Planner](#).....Page  
Chart of some upcoming IAPR and non-IAPR conferences of interest to the IAPR community.

## ***Calls for Papers***

### GbR 2009

*7th IAPR - TC-15 Workshop on  
Graph-based Representations in Pattern Recognition*  
Venice, Italy  
Deadline: January 17, 2009  
May 26–28, 2009

### MCS 2009

*8th International Workshop on Multiple Classifier Systems*  
Reykjavik, Iceland  
Deadline: January 19, 2009  
June 10–12, 2009

### CRV 2009

*Sixth Canadian Conference on Computer and Robot Vision*  
Kelona, British Columbia, Canada  
Deadline: January 30, 2009  
May 25-27, 2009

### PRIP 2009

*10th International Conference  
"Pattern Recognition and Information Processing"*  
Minsk, Belarus  
Deadline: January 31, 2009  
May 19–21, 2009

### ICIAP 2009

*15th International Conference on Image Analysis and Processing*  
Vietri sul Mare, Salerno, Italy  
Deadline: January 31, 2009  
September 8-11, 2009

### CAIP 2009

*13th International Conference on  
Computer Analysis of Images and Patterns*  
Münster, Germany  
Deadline: March 31, 2009  
September 2–4, 2009

### PRIB 2009

*4th IAPR International Workshop on Pattern Recognition in Bioinformatics*  
Sheffield, United Kingdom  
Deadline: April 1, 2009  
September 7-9, 2009

### CIARP 2009

*14th Iberoamerican Conference on Pattern Recognition*  
Guadalajara, México  
Deadline: June 7, 2009  
November 15–18, 2009

### ICFHR 2010

*International Conference on Frontiers in Handwriting Recognition*  
Kolkata, India  
Deadline: ?  
November 16–18, 2010

### ICPR 2010

*20th International Conference on Pattern Recognition*  
Istanbul, Turkey  
Deadline: January 15, 2010  
August 23-26, 2010

## ***Call for Submissions***

### ***IAPR Newsletter***

*Articles, announcements, book reviews,  
conference and workshop reports*

Contact the editor:

Alexandra Branzan Albu, [aalbu@ece.uvic.ca](mailto:aalbu@ece.uvic.ca)

**Deadline: March 22, 2009**

The logo for the IAPR Newsletter features the acronym 'IAPR' in a bold, purple, sans-serif font. To the right of 'IAPR' is a circular icon containing a stylized globe or network diagram. Below 'IAPR' is the word 'Newsletter' written in a large, elegant, black cursive script.

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# Feature Article

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## ICPR 2008 Highlights

Check out the post conference links at the ICPR 2008 web site: [www.icpr2008.org](http://www.icpr2008.org)

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**Papers can be accessed through session links**  
[www.icpr2008.org/ICPR08\\_ProgramAtAGlanceWeb.html](http://www.icpr2008.org/ICPR08_ProgramAtAGlanceWeb.html)

Thank you to all who contributed reviews of the Invited Talks presented at ICPR 2008. Without you this Feature would not have been possible. ~A. Branzan Albu, ed.

The Invited talks at ICPR2006 covered a wide variety of topics relevant to the IAPR Community. The Feature Article in this issue of the *IAPR Newsletter* presents reviews of these talks.

**Invited Talk 1—K.S. Fu Prize Lecture: Data Clustering: 50 Years Beyond K-means**

By [Anil Jain](#) (USA); Reviewed by [Alexandra Branzan Albu](#) (Canada) ..... Page 4

**Invited Talk 2: Towards Brain Computer Interfacing**

By [Klaus-Robert Müller](#) (Germany); Reviewed by [Alexandra Branzan Albu](#) (Canada)..... Page 6

**Invited Talk 3: Limitations of Content-based Image Retrieval**

By [Theo Pavlidis](#) (USA); Reviewed by [Alexandra Branzan Albu](#) (Canada) ..... Page 8

**Invited Talk 4: Recent Developments in the Study of Rapid Human Movements Using Kinematic Theory**

By [Réjean Plamondon](#) (Canada); Reviewed by [Frédéric Jean](#) (Canada) ..... Page 9

**Invited Talk 5—J.K. Aggarwal Prize Lecture: Pursuing Explicit and Implicit Manifolds by Information Projection**

By [Song-Chun Zhu](#) (USA); Reviewed by [Aveek Shankar Brahmachari](#) (USA) ..... Page 10

**Invited Talk 6: Getting the Big Picture from the Small by (making) Sense of Direction**

By [Josef Bigun](#) (Sweden); Reviewed by [Vasant Manohar](#) (USA) ..... Page 12

**Invited Talk 7: Hardware and Software Architectures for Secure Biometric Systems**

By Barry W. Johnson (USA); Reviewed by [Vasant Manohar](#) (USA) ..... Page 13

**Invited Talk 8: Classifier Ensembles: Facts, Fiction, Faults, and Future**

By [Ludmila I. Kuncheva](#) (UK); Reviewed by [Vasant Manohar](#) (USA)..... Page 14

**Award Winners:**

**Lists of 2008 IAPR Fellows and ICPR 2008 Best Paper award recipients.** ..... Page 15

# Feature Article

## ICPR 2008 Invited Talk 1

### K.S. Fu Prize Lecture



#### *Data Clustering: 50 Years Beyond K-means*

By [Anil Jain](#) (USA)

Reviewed by [Alexandra Branzan Albu](#) (Canada)

Professor King-Sun 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.

The [K.S. Fu Prize](#) is a biennial award that is given to a living person in the recognition of an outstanding technical contribution to the field of pattern recognition.

This year's recipient was Professor Anil K. Jain, University Distinguished Professor in the Departments of Computer Science & Engineering, and Electrical & Computer Engineering at Michigan State University.

Dr. Jain warmed up his audience with an interesting example of data clustering in archeology (clustering of Apsara faces at the Angkor Wat temple), showing therefore that data categorization is a fundamental problem shared by many scientific fields.

The talk continued with an elegant statement of the data clustering problem, which is an unsupervised classification method for grouping objects into meaningful categories. Mathematically speaking, a clustering problem typically receives as input *representations* of  $N$  objects, and generates  $K$  *clusters* based on a measure of *similarity*.

Clustering started as a natural classification problem in biology, where the degree of similarity among forms was used to form taxonomies and phylogenetic relationships. Today, there are many more clustering-related problems, including data exploration and data compression in any scientific field that data. The exploratory nature of cluster analysis is well-suited to the data explosion phenomenon that we witness today. To manage an ever-expanding amount of data, one needs tools that

reveal the underlying structure of data, generate hypotheses for future data trends, and detect anomalies. Clustering algorithms are at the core of these tools.

Dr. Jain's talk discussed the milestones in the history of clustering algorithms. It was interesting to learn that 'cluster analysis' is a term coined by a 1954 article analyzing anthropological data. Another historical detail that intrigued the audience was the four independent discoveries of the K-Means algorithm (Steinhaus in 1956, Lloyd in 1957, Cox in 1957, Ball & Hall in 1967, and MacQueen in 1967). The basics of the K-means algorithm were briefly discussed, as well as some of its versions (Bisecting K-means by Karypis et al., X-means by Pelleg and Moore, Constrained K-means by Davidson, and Scalable K-means by Bradley et al.). Dr. Jain also presented the main paradigms in data clustering that go beyond K-means, such as Bayesian models, kernel methods, association rules (subspace clustering), graph mining, and large scale clustering.

*(Continued on page 5)*

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One of the most interesting parts of Dr. Jain's talk covered the 'user dilemmas' in data clustering. What is a cluster? What data representation paradigm is best suited? How many clusters? Which clustering method? Are the discovered clusters & partition valid? etc. Although some of these dilemmas were described by Dubes & Jain in a 1976 issue of *Pattern Recognition*, they remain strikingly actual and thus worth being revisited.

The final part of Dr. Jain's talk addressed the new trends in clustering-related work, such as clustering of large-scale data, evidence accumulation by combining multiple partitions, multi-way clustering, and clustering complex data types.

**More information:**

Biometrics Research  
Homepage  
at  
Michigan State University

[biometrics.cse.msu.edu/](http://biometrics.cse.msu.edu/)

# Feature Article

## ICPR 2008 Invited Talk 2



### *Towards Brain Computer Interfacing*

By [Klaus-Robert Müller](#) (Germany)

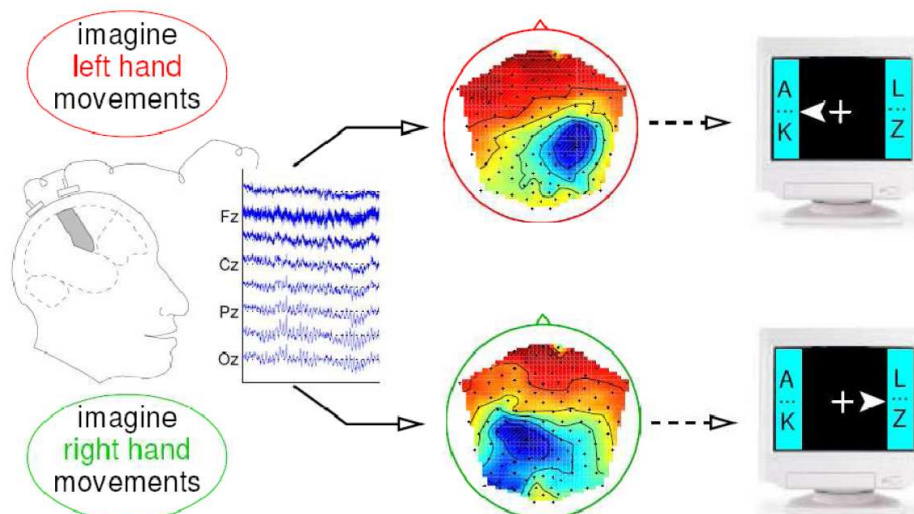
Reviewed by [Alexandra Branzan Albu](#) (Canada)

Imagine raising your left hand. Did you know that a brain-computer interface can read your intention and use it for controlling the screen motion of a cursor? The [Intelligent Data Analysis group](#) at the TU Berlin and Fraunhofer Institute FIRST is currently working on non-invasive brain-computer interfacing via computational neuroscience techniques.

Research on non-invasive brain computer interfaces (BCI) aims at translating human intentions into a technical control signal without the use of any muscle activity or peripheral nerves. All mental activities, such as visual perception, audio perception, articulating words, and intention to move, are expressed via excitation and inhibition of distributed neural structures or networks. Adequate sensors are used to record changes in electrical potentials or magnetic fields; this represents input data for the BCI.

The Brain Computer Interface developed in Berlin uses non-invasive EEG techniques to record the electrical activity of the brain. Their [Berlin BCI \(BBCI\)](#) is harvesting advanced machine learning, signal processing and pattern recognition technology. Their paradigm uses healthy subjects untrained for BCI, and requires a training phase and an on-line feedback session. During the training phase, subjects are asked to imagine right/left hand movements, so that their electrical activation patterns can be learned by the computer.

*(Continued on page 7)*



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One of the main challenges faced by the processing of EEG signals is due to variances: single trial versus averaging, session to session variability, and inter-subject differences. This is why a machine learning approach was used in the BBCI for EEG single-trial preprocessing.

Non-invasive brain computer interfaces will be useful for a variety of applications. They are valuable communication tools for disabled

subjects, as shown by Dr. Müller in the BCI-based spelling example [1]. Other applications include control of prosthetic robots and cognitive workload assessment for predicting drowsiness on the road.

[1] B. Blankertz, M. Krauledat, G. Dornhege, J. Williamson, R. Murray-Smith, and K.-R. Müller, "[A note on brain actuated spelling with the Berlin Brain-Computer Interface.](#)" in *Universal Access in HCI, Part II, HCII 2007*, ser. LNCS, C. Stephanidis, Ed., vol. 4555. Berlin Heidelberg: Springer, 2007, pp. 759–768.

### More information:



Berlin Brain-Computer Interface  
web site

[www.bbc.de](http://www.bbc.de)

# Feature Article

## ICPR 2008 Invited Talk 3



### *Limitations of Content-based Image Retrieval*

By [Theo Pavlidis](#) (USA)

Reviewed by [Alexandra Branzan Albu](#) (Canada)

Content-based image retrieval (CBIR) remains a hard problem after more than 20 years of research efforts. Dr. Pavlidis' talk started with a thought-provoking overview on the state-of-the-art of the field. Despite the numerous publications in this area, there are very few systems that allow on-line testing of authors' methodologies, and the results from on-line testing are in general poorer than the published results.

There is a distinction between general and application-specific CBIR. In general CBIR, a query image needs to be matched to an arbitrary collection of images, such as images found on internet. General CBIR is closely related to the object recognition problem, since the goal of the query is to obtain images containing the same object of the query. Application-specific CBIR performs matching of the query image on collections of images of a specific type (such as fingerprints, X-rays of a specific organ, etc). One may note that general CBIR problems can be much harder than application-oriented ones, which take advantage of domain-specific knowledge.

Dr. Pavlidis identified some methodological issues in general CBIR. First, some papers propose solutions in search of a problem, thus the queries that they use have little practical significance. Second, classifier-based methods are not able to deal with open collections of images, since the retrieval system is limited to the finite set of classes of objects. Third, there is a scaling issue in methods that are developed over small sets of samples; it is unclear

how well will these methods generalize over an ever-expanding amount of image data. Perhaps the most critical shortcoming of existing CBIR methods is their reliance upon pixel-wise similarity, which is very different from perceptual similarity. Dr. Pavlidis referred to this issue as "a semantic abyss" that needs to be addressed by new methodologies.

Why is general CBIR so difficult? Text retrieval is much easier than image retrieval because primitives in text (i.e. characters) carry semantic meaning; in images, the semantic meaning of their content is not distributed on a per pixel basis. The main challenge is to find measures for perceptual and conceptual similarity in images.

Dr. Pavlidis recommends pursuing research on specific CBIR problems that satisfy certain feasibility criteria. He considers that "until there is sufficient progress in object recognition or in application specific CBIR, *general CBIR research is unlikely to be fruitful, especially when constraints on real time performance are added*".

**More information  
and links to  
presentation notes  
and slides:**

[www.theopavlidis.com/](http://www.theopavlidis.com/)



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# Feature Article

## ICPR 2008 Invited Talk 4

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### *Recent Developments in the Study of Rapid Human Movements Using Kinematic Theory*

By [Réjean Plamondon](#) (Canada)

Reviewed by [Frédéric Jean](#) (Canada)

In his talk, Professor Plamondon first introduced his research interests and the projects that are ongoing in his research group. His work is focused on developing and analyzing the modeling of trajectory perception and human movement generation, with applications to automatic processing of handwriting. This includes applications to biometry (signature verification), recognition (online handwriting processing), education (handwriting learning tools), biomedical (neuromuscular condition evaluation), and model-based document preprocessing.

The audience was then presented the definition of a stroke and its properties. Professor Plamondon insisted on the speed accuracy trade-offs, that is, the spatial accuracy and the temporal accuracy. This led to a short introduction to the kinematic theory, which states that there is a synergy between two competing systems in order to perform strokes: The agonist system, which works in the direction of the performed movement, and the antagonist system that works in the opposite direction. Knowing that the impulse response of the neuromuscular system has a lognormal profile, the combination of those competing systems leads to a delta-lognormal velocity profile, which can be modeled by seven parameters. Those parameters can be extracted from acquired delta-lognormal profiles by algorithms developed by Professor Plamondon and his team. He described the first algorithms that were developed for that purpose as well as the recently developed ones. He also presented an evaluation methodology to assess the performance of those

algorithms.

Next, the effect of age on the delta-lognormal profile parameters was analyzed using rapid strokes with direction reversal acquired from old and young people. The experiment showed that the seven parameters are influenced by age. Moreover, similar changes have been observed on the agonist and antagonist components. Reporting two other experiments, he also confirmed the basic hypotheses of his model, first by highlighting the proportionality relationship between the timing of muscle activation through EMG signal analysis, and second, by pointing out the existence of a new evoked response in EEG signals that correlates to the time occurrence of the neuromuscular commands.

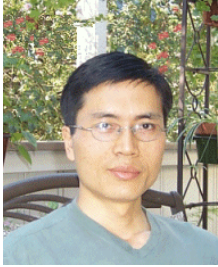
Professor Plamondon then presented a more general version of the kinematic theory, which takes into account the fact that the agonist and antagonist systems might not work in perfect opposition for complex movements. This generalized kinematic theory leads to a sigma-lognormal velocity profile. The parameters extraction for the sigma-lognormal model was then discussed (interactive and automatic method). Applications were also discussed in depth, like the analysis and synthesis of handwriting variability, automatic database generation, and EMG and EEG signal analysis.

He finished his presentation with an overview of the numerous other applications that may be possible, from handwriting recognition and signature verification to biomedical signal processing and the design of psychomotor tests.

# Feature Article

## ICPR 2008 Invited Talk 5

### J.K. Aggarwal Prize Lecture



#### *Pursuing Explicit and Implicit Manifolds by Information Projection*

By [Song-Chun Zhu \(USA\)](#)

Reviewed by [Aveek Shankar Brahmachari \(USA\)](#)

Dr. Zhu started his talk by enlightening the audience with the need for a unified approach that can give the structure of the whole ensemble of generic natural images. He said that real world data are highly complex, non-Gaussian, and show high kurtosis. In his talk, he showed how pursuit of explicit and implicit manifolds by information projection can be done to yield the structure of the whole ensemble.

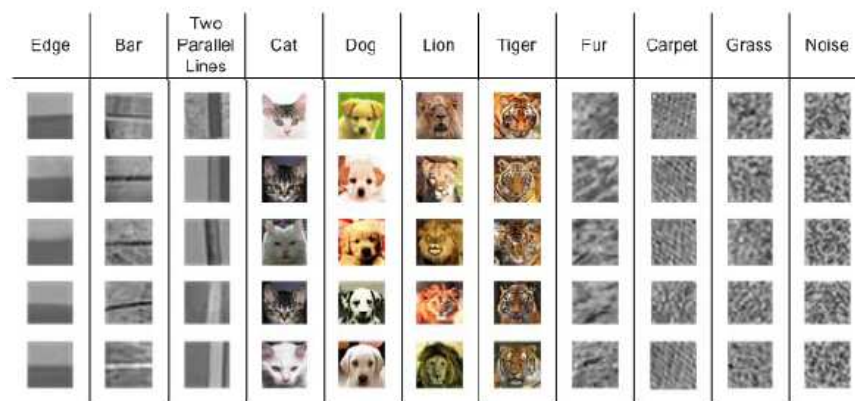


Fig. 1 Showing image categories from low entropy to high entropy

Dr. Zhu showed a wide spectrum of images of various categories from low to high entropy. Low and high entropy categories were seen containing less information. The middle entropy image category contains the most information. He suggests a unified framework to learn a probabilistic model on the space of image patches, intuitively governed by the above observation.

Image patches are fundamental elements for object recognition and modeling. Explicit manifold is a low dimensional, low entropy manifold

(Continued on page 11)

(Continued from page 10)

spanned by image patches generated from the primitive model which involves hidden variables. Implicit manifolds are formed by image patches that share feature statistics. Implicit manifolds have high entropy. Implicit manifolds are specified by Markov Random Fields. Hidden variables for explicit manifolds and feature statistics for implicit manifold were suggested for the unified framework.

Kullback-Leibler divergence is used as negative log likelihood for pursuit of explicit and implicit manifolds. KL divergence is monotonically decreased by information projection to learn a probabilistic model on the space of image patches. Maximin learning principle was presented, claiming that it unifies other known visual modeling. This was followed by case studies and results.

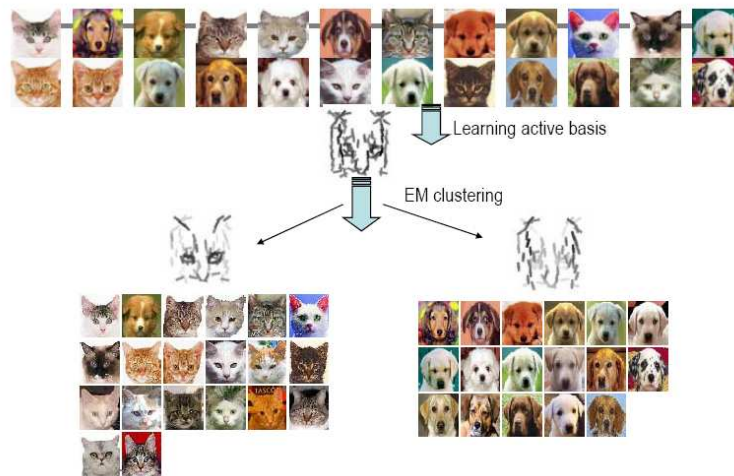


Fig.2 One of the result shown in Dr. Zhu's talk

Dr. Zhu concluded by talking about manifold transitions due to information scaling and summarized by recapitulating all the "ingredients of our herbs": two type manifolds, pursuit, integration, mixing, and transition.

# Feature Article

## ICPR 2008 Invited Talk 6



### *Getting the Big Picture from the Small by (making) Sense of Direction*

By [Josef Bigun](#) (Sweden)

Reviewed by [Vasant Manohar](#) (USA)

Directional signal processing, an increasingly crucial element of computer vision for which neural circuits exist in human vision, and its applications in various fields, such as biometrics, texture analysis, and content-based image retrieval, was the focus of the plenary session by Josef Bigun (Halmstad University, Sweden).

After going through a few basic concepts on the perception of direction in the human visual system and in computer vision, Dr. Bigun described a set of complex differential operators that can be used to produce and filter dense orientation (tensor) fields for feature extraction, matching, and pattern recognition. The invariance properties of these operators, which he calls *symmetry derivatives*, have useful consequences for local orientation-based feature extraction with greater analytical precision as well as computational efficiency.

In one of the applications, a robust alternative to conventional minutiae extraction for fingerprint recognition systems is proposed. The proposed parabolic symmetry features accurately detect the position and the direction of a minutia simultaneously. In order to quantify enhancement, the speaker presented results that showed lower matching errors even for a commercial grade matcher using the suggested pre-processing method.

Further, Dr. Bigun suggested a novel identity authentication technique by a synergetic use of lip-

motion and speech. The lip-motion is defined as the distribution of apparent velocities in the movement of intensity patterns in an image and is estimated by computing the velocity components of the structure tensor. Since the velocities are computed without extracting the subject's lip-contours, more robust visual features can be obtained in comparison to motion features extracted from lip-contours. Besides its value in authentication, the technique can be used naturally to evaluate the "liveness" of someone speaking as it can be used in a text-prompted dialogue.

In essence, through a very informative lecture, Dr. Bigun described the symmetry derivatives, and, by means of multiple applications, he illustrated the interest and the usage of the associated theorems and lemmas in practical situations.

For more details on the work by  
the speaker, visit  
[www2.hh.se/staff/josef/](http://www2.hh.se/staff/josef/)  
and  
refer his book



[Vision with Direction](#)  
(Springer, 2006)

# Feature Article

## ICPR 2008 Invited Talk 7

### *Hardware and Software Architectures for Secure Biometric Systems*

By Barry W. Johnson (USA)  
Reviewed by [Vasant Manohar](#) (USA)

With increasing amount of concerns raised on the cost-effectiveness, plausibility, and—most important of all—vulnerability of biometrics-based personal authentication systems, the plenary talk by Barry Johnson (Chairman and CTO of [Privaris, Inc](#) ([www.privaris.com](http://www.privaris.com)); Professor of ECE and Associate Dean of Research, University of Virginia) on personal biometrics couldn't have been more significant and relevant.

The main goal of personal biometrics is to define a self-contained and onboard biometrics solution that is exclusive to an individual. Besides providing secure and cost-effective implementations, it should create a single authentication solution for multiple applications. One such product is the *plusID* (shown in the figure below), developed by Privaris, which is a fully distributed fingerprint-based



All of the following steps are performed on the device: sensing, enrollment, biometric processing, storage, and matching. Such an approach protects the user's privacy by retaining all fingerprint information in a secure processor of the tamper resistant device, not in a centralized biometric database. It also eliminates the enterprise's liability and maintenance costs associated with implementing and securing a biometric database. For more specifications on plusID, visit [www.privaris.com/products/index.html](http://www.privaris.com/products/index.html) and refer the associated [white paper](#) at the same URL.

In the near future, Johnson also envisions systems on cell phones that use touch screen as a human-machine interface technology. If this becomes a reality and sees widespread deployment, we would indeed have “*security at our fingertips*”.

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# Feature Article

## ICPR 2008 Invited Talk 8

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### *Classifier Ensembles: Facts, Fiction, Faults, and Future*

By [Ludmila I. Kuncheva](#) (UK)  
Reviewed by [Vasant Manohar](#) (USA)

Why do we choose to use classifier ensembles in our learning applications? Is it because: (a) we are inclined towards complicating entities beyond necessity; (b) it is very difficult to design and train a single sophisticated classifier; or (c) we believe that a combination of multiple classifiers always learns a more expressive concept? Have we truly made progress in classification methods or are many of the implied advances illusory? In an absorbing keynote talk, Ludmila Kuncheva (School of Computer Science, Bangor University, Wales, UK) gave her perspective on these questions.

The central idea of classifier ensembles is to combine the output of several diverse classifiers in an attempt to reach a more accurate decision than that of a carefully designed individual classifier. Though the number of publications on classifier ensembles and associated techniques has increased tremendously in the past few years, it is surprising that there is a huge disparity among the opinions of experts in the community as to what is our current level of scientific understanding of ensemble-type multi-classifier systems—are they mature or lacking?

It has been shown in literature that an ideal ensemble consists of highly correct classifiers that disagree as much as possible. Kuncheva advocates an idea of measuring diversity and using it in the process of building an ensemble. The message purported is that there is still room for heuristic in

classifier combination, and diversity might well be one of the directions for further exploration.

In pointing out the typical mistakes we end up making, Kuncheva alluded to the alarming amount of varied jargon that mean the same across the pattern recognition, the data mining, the machine learning, and the statistics fields. Such disagreement just shows that we make little effort to keep ourselves well informed and, as a consequence, end up re-inventing the wheel many times.

In her concluding remarks, Kuncheva expressed her view that we have acquired quite a lot of unstructured insight on multi-classifier combination methods. There has been a significant number of experiment studies and a few exciting theories on different ensemble building and combination methods. So, the answer to the question, “*Have we truly made progress?*” is yes and no. Yes, we know a lot, and no, we don’t yet have the all-explaining theory. Of course, it’s this quest that makes research challenging and entertaining.

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# Feature Article

## Congratulations 2008 IAPR Fellows!

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**Bhabatosh Chanda**

For contributions to the theory and practice of digital image processing and analysis.

**Emlyn Roy Davies**

For contributions to the theory and practice of machine vision and its promotion through education, authorship and society activities.

**Mário A. T. Figueiredo**

For contributions to unsupervised and supervised learning, image analysis, and wavelet-based image restoration.

**Robert B. Fisher**

For contributions to 3D computer vision and the development of online resources important to the research community.

**Atsushi Imiya**

For contributions to randomized model fitting approaches in pattern recognition and computer vision, and to discrete geometry.

**Mohamed S. Kamel**

For contributions to fundamental, applied and industrial problems in pattern recognition and neural networks.

**Mineichi Kudo**

For contributions to pattern classification and feature extraction.

**Brian C. Lovell**

For contributions to video and medical image analysis and service to the IAPR.

**Fionn Murtagh**

For contributions to clustering and analysis of massive and high dimensional data, with applications to astronomy.

**Masaki Nakagawa**

For contributions to handwriting recognition and its applications.

**Mark Nixon**

For contributions to biometrics and computer vision.

**Marcello Pelillo**

For contributions to graph-theoretic and optimization-based approaches in pattern recognition and computer vision.

**P. Jonathon Phillips**

For contributions to face recognition and evaluation methodologies.

**Nalini K. Ratha**

For contributions to biometric authentication.

**Sudeep Sarkar**

For contributions to computer vision, particularly perceptual organization, segmentation and grouping, and to the evaluation of vision algorithms.

**David G. Stork**

For contributions to pattern recognition education, machine learning, speech recognition, and the application of computer vision to the study of art.

**Tamás Szirányi**

For contributions to stochastic models and learning methods for video event analysis, and to energy optimization-based image and video segmentation.

**Massimo Tistarelli**

For contributions to computer vision, and biometrics research and education.

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# Feature Article

## Congratulations

### Best Paper Award Winners!

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#### **Best Scientific Paper Awards**

##### Motion, Tracking, Video Analysis

Yuping Shen, Nazim Ashraf, Hassan Foroosh, "Action Recognition Based on Homography Constraints"

##### Signal Theory and Representation

Karthik Gurumoorthy, Ajit Rajwade, Arunava Banerjee, Anand Rangarajan, "Beyond SVD: Sparse Projections Onto Exemplar Orthonormal Bases for Compact Image Representation"

##### Multimedia Processing and Content-Based Information Retrieval

Yoon Bai, Choonseog Park, Yoonsuck Choe, "Relative Advantage of Touch Over Vision in the Exploration of Texture"

##### Document Analysis and Recognition

Michael Donoser, Horst Bischof, Silke Wagner, "Using Web Search Engines to Improve Text Recognition"

##### Bioinformatics and Biomedical Applications

Gunnar L  th  n, Jimmy Jonasson, Magnus Borga, "Phase Based Level Set Segmentation of Blood Vessels"

##### Fingerprint Recognition

Abhishek Nagar, Karthik Nandakumar, Anil Jain, "Securing Fingerprint Template: Fuzzy Vault with Minutiae Descriptors"

#### **IBM Best Student Awards**

##### Image Modelling and Scene Understanding

Xi Zhou, Xiaodan Zhuang, Hao Tang, Mark Hasegawa-Johnson, Thomas Huang, "A Novel Gaussianized Vector Representation for Natural Scene Categorization"

##### Statistical Pattern Recognition

Son Joken, Naoya Inoue, Yukihiro Yamashita, "Numerical Analysis of Mahalanobis Metric in Vector Space"

##### Superresolution and Inpainting

Zafer Arican, Pascal Frossard, "Super-Resolution from Unregistered Omnidirectional Images"

##### Handwriting Recognition

Jose A. Rodriguez, Florent Perronnin, Gemma Sanchez, Josep Llados, "Unsupervised Writer Style Adaptation for Handwritten Word Spotting"

##### Bioinformatics and Biomedical Applications

Florence Cloppet, Arnaud Boucher, "Segmentation of Overlapping/aggregating Nuclei Cells in Biological images"

##### Fingerprint Recognition

Javier Galbally, Raffaele Cappelli, Alessandra Lumini, Davide Maltoni, Julian Fierrez, "Fake Fingertip Generation from a Minutiae Template"

#### **Best Industry Related Paper Award 2008**

##### Multimedia Processing and Content-Based Information Retrieval

Yuyu Liu, Yoichi Sato, "Recovering Audio-To-Video Synchronization by Audiovisual Correlation Analysis"

#### **Piero Zamperoni Best Student Paper Award**

##### Motion, Tracking, Video Analysis

Ming Zhao, Chi-kit Ronald Chung, "Critical Congurations of Lines to Geometry Determination of Three Cameras"

#### **Best Biometrics Student Paper Award**

Bappaditya Mandal, Xudong Jiang and Alex Kot, "Verification of Human Faces Using Predicted Eigenvalues"



# News from the IAPR EXECUTIVE COMMITTEE

By [Denis Laurendeau](#)

We hope that you enjoyed the last [ICPR](#) in Tampa Bay. The conference was a great success and offered the IAPR community an excellent opportunity to meet and exchange ideas on topics related to pattern recognition. Congratulations to the ICPR 2008 Organizing Committee for preparing the conference. We now wish good luck to the ICPR 2010 Organizing Committee. [ICPR 2010](#) will take place in Istanbul, Turkey, on August 23-26, 2010. This ICPR will have a



special meaning since it will be the 20<sup>th</sup> anniversary of IAPR's main event. Tsukuba Science City, Japan, has been selected by the Governing Board as the venue for ICPR 2012. In order to reduce the workload of the organizers, the IAPR Governing Board has approved a motion for using a professional software package for managing the conference that should help in making the organizing process easier.

This is the first "From the ExCo" column written by the new Executive Committee. The newly appointed ExCo started immediately to work on a number of issues. As usual, an urgent task in the months after ICPR is to set up the standing committees and to appoint new chairpersons to TCs with outgoing chairs for this new term. Again, the ExCo will encourage Technical Committees to appoint vice chairs, the idea being to favor continuity from one term to the other, to enhance diversity in geographical distribution, and to involve young scientists in the life of the committees.

According to IAPR's constitution and bylaws, the Nominating Committee, the KS Fu Prize Committee,

and the J.K. Aggarwal Prize Committee need a vote by the Governing Board. The ballot will be initiated soon and we will report on its result in a future issue of the newsletter. For all committees, please refer to the association's web page, [www.iapr.org](http://www.iapr.org), for the latest update of the IAPR directory, with the names and contact information of all the standing committee members.

The Governing Board meeting in Tampa voted a few amendments to the IAPR's Constitution, Bylaws and Statutes. This will be incorporated very soon into the text which can be found on the association's web site.

At the GB meeting in Tampa, the creation of a new Technical Committee on Computational Forensics, TC6, which was presented by Dr. Katrin Franke, has been approved by the GB.

The IAPR financial situation is good and will allow the policy of issuing stipends to help with travel expenses to the ICPR to continue, with an expected increase in the number of stipends for 2010. Again this year for the ICPR in Tampa, researchers, most of them young scientists, benefited from this support.

The ExCo would like to express its sincere thanks to Larry O'Gorman for the excellent work he has done over the past years as editor of the *Newsletter*. Larry has managed the transition from paper support to full electronic support efficiently and has given the newsletter a new flavor that has been very much appreciated by the IAPR community. Dr. Alexandra Branzan Albu, from the University of Victoria, Canada, will be the new editor of the *Newsletter* ([see related article](#)) in replacement of Larry.

We also extend our warmest thanks to Walter

*(Continued on page 18)*

*(Continued from page 17)*

Kropatsch, Katsushi Ikeuchi, and Sergey Ablameyko for their work as members of the ExCo. Although they are no longer ExCo members, we are convinced that they will still participate very actively in IAPR activities. Their contribution to the association is invaluable, and we hope that it will continue for a long time ahead.

The new members of the ExCo, Brian C. Lovell (President), Apostolos Antonacopoulos (1st Vice-President), Ingela Nyström (2nd Vice-President) as well as returning members Kim Boyer (Treasurer), Denis Laurendeau (Secretary), and Karl Tombre (Past President) look forward working with the IAPR community for the next two years.

## 2008-2010 Executive Committee:

President: Brian C. Lovell (Australia)



1st Vice President:  
Apostolos Antonacopoulos (UK)



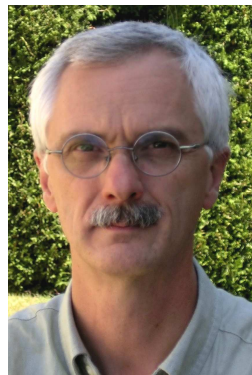
2nd Vice President: Ingela Nyström (Sweden)



Treasurer: Kim Boyer (USA)



Secretary: Denis Laurendeau (Canada)



Past President: Karl Tombre (France)



# INSIDE the IAPR

## *Hello from the New Editor of the IAPR Newsletter*

by [Alexandra Branzan Albu](#)

University of Victoria, British Columbia, Canada



### About the Editor

**Alexandra Branzan Albu** is an Assistant Professor in the Department of Electrical Engineering at the University of Victoria (British Columbia, Canada). She is currently doing research in video-based human motion analysis and in medical imaging.

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With this issue, I begin my tenure as editor of the *IAPR Newsletter*. I accepted this position as it enables me to serve as a liaison between the many “worlds” covered by pattern recognition applications. While most of us work, research and publish in highly specialized areas of pattern recognition, the *Newsletter* offers us the opportunity to reconnect to the big picture and inspires us to expand our thinking beyond our specific domains of interest. Larry O’Gorman, the past editor for six years, has taken us on an incredible journey through his feature articles highlighting pattern recognition successes in sports (April 2003), security and entertainment (June 2003), maps (September 2003), defense (January 2004), astronomy (April 2005), traffic (July 2005), biometrics (January 2006), and digital libraries (July 2006).

Larry O’Gorman has established a high-quality publication standard for the *Newsletter*. It will be hard to follow in his footsteps, although he has made all efforts for smoothing the editorial transition. I am also grateful to Linda O’Gorman, the layout editor, for her much appreciated support with the transition; I am looking forward to working with Linda.

As new editor, I would like to take this opportunity to invite all IAPR members to participate in every aspect of *Newsletter* that appeals to them. You may wish to propose a new column, volunteer to contribute to one of the regular features, write a special article, propose a theme and act as coordinator for a special issue, etc. We want the *Newsletter* to represent the interests of IAPR members and to be a useful publication that will be worth your reading. We can only do that with your help. We cannot say this better than Maria Petrou did in 1994: “a successful newsletter cannot be a one-man band - not even a two-women band!”



# Conference Report: [CIARP 2007](#) 12th Iberoamerican Congress on Pattern Recognition

13-16 November 2007  
Viña del Mar- Chile

## General Chairs:

**Max Chacón (Chile)**  
**Hector Allende (Chile)**

## Program Chairs:

**Josef Kittler (UK)**  
**Luis Rueda (Chile)**  
**Domingo Mery (Chile)**

**Report prepared by: Max Chacón (Chile)**

**CIARP**, Congreso Iberoamericano de Reconocimiento de Patrones (Iberoamerican Conference on Pattern Recognition) is the name of a conference that was first organized in Havana, Cuba, in January 23-28, 1995. Since its beginning, the aim of the congress was the presentation of ongoing research in mathematical methods and computational techniques in pattern recognition in general: computer vision, image analysis, speech recognition, etc., as well as the applications of these techniques in areas related to robotics, industry, health, entertainment, space exploration, telecommunications, data mining, document analysis, natural language processing and recognition. Moreover, it has been always a forum for exchanging scientific research experience, sharing new knowledge, and increasing cooperation between research groups in pattern recognition and related areas in our geographical zone.

This event was organized by the Chilean Association for Pattern Recognition ([AChiRP](#)), and it was sponsored by the International Association for Pattern Recognition ([IAPR](#)), Cuban Association for Pattern Recognition ([ACRP](#)) the Mexican Association for Computer Vision, Neural Computing and Robotics ([MACVNR](#)), the Special Interest Group on Pattern Recognition of the Brazilian Computer Society ([SIGPR-SBC](#)), the Spanish Association for Pattern Recognition and Image Analysis ([AERFAI](#)) and the Portuguese Association for Pattern Recognition ([APRP](#)).

This year, the forum attracted participants from 36 coun-

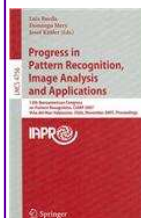
tries (8 from Iberoamérica), who submitted a total of 200 papers. After the double-blind reviewing process, 94 papers by 168 authors from 28 countries were accepted and included in the LNCS proceedings, with 81 presented papers and a 48% rejection rate.

In the framework of this conference, the annual meeting of the Steering Committee of CIARP was held with the participation of representatives of the national associations for pattern recognition from Spain, Portugal, Mexico, Chile, and Cuba. For first time, representatives of the future associations from Uruguay and Perú also took part.

We want to express our gratitude to the Professors Anil Jain, Maria Petrou, Sorin Draghici, Horst Bunke, who gave us very interesting tutorials and keynotes.

[CIARP 2009](#) will be held in Guadalajara, Mexico. It will be organized by the CINVESTAV and with Prof. Eduardo Bayro-Corrochano serving as General Chair.

**Proceedings of the conference have been published by Springer-Verlag in Lecture Notes in Computer Science Series (volume number 4756).**



*Progress in Pattern Recognition,  
Image Analysis and Applications*

Luis Rueda, Domingo Mery and Josef Kittler  
Eds., LNCS 4756, Springer, 2007

# Workshop Report: [DAS 2008](#) 8th IAPR International Workshop on Document Analysis Systems

16-19 September 2008

Nara, Japan

**Co-chairs:**

[Koichi Kise](#) (Japan)  
[Hiroshi Sako](#) (Japan)

**Report prepared by:** [Hiroshi Sako](#)



*Brave DAS2008 participants who kicked Typhoon 13 out of Nara*

DAS2008 was co-sponsored by IAPR, the Japan Society for the Promotion of Science, International Information Science Foundation, Hitachi Ltd., Hitachi Computer Peripherals Co., Ltd., and Osaka Prefecture University, and in cooperation with the Institute of Electronics, Information and Communication Engineers, Japan. The venue was Nara Prefectural New Public Hall, Japan. Nara was the capital of Japan from 710 to 784 AD, and is a beautiful ancient “UNESCO World Heritage” city having many historical shrines and temples. The oral presentations were held at the impressive Noh theatre in the Hall.

The topics of the workshop were algorithms and architectures of document analysis systems. 115

manuscripts were submitted from 21 countries/regions. The program featured 24 oral talks, 56 posters, two IAPR keynote lectures, and two tutorials. In addition, seven extended abstracts and seven demonstrations were presented. There were 119 participants (71 from overseas, 48 from inside Japan), and one unwelcome guest: Typhoon 13 from the South Pacific.

Two keynote lectures showed recent progress in their R&D fields and important messages toward future digital society and culture: “Extraction of Text Objects in Video Documents: Recent Progress” by Prof. Rangachar Kasturi (the 2008

*(Continued on page 22)*

(Continued from page 21)

President of the IEEE Computer Society, University of South Florida, USA) and “Digital Renaissance — Making Archives, Sharing Wisdoms and Creating Values” by Prof. Toshiro Kamiuchi (University of Florence, Italy, Int. DIS Laboratory Co., Japan).

Two [tutorials](#) were organized in conjunction with the workshop: “Statistical and Adaptive OCR—a Hands-On Tutorial with OCRopus” by Prof. Thomas Breuel (Technical University of Kaiserslautern and DFKI, Germany) and “Unlocking the World's Knowledge: The Analysis of Historical Documents” by Dr. Apostolos Antonacopoulos (University of Salford, UK).

In memory of the late Prof. Yasuaki Nakano, the honorary chair of this workshop and the general chair of DAS1998, the IAPR Nakano Award (the best paper award) was given to Georg Buscher and Andreas Dengel, the authors of the paper entitled “Attention-Based Document Classifier Learning”. The Honorable Mention went to Takuma Yamaguchi and Minoru Maruyama, the authors of the paper entitled “Feature extraction for Document Image segmentation by pLSA model”, and to Mudit Agrawal, the substitute presenter of the paper entitled “Super-resolution of Text Images Using Edge-Directed Tangent Field” authored by Jyotirmoy Banerjee and C.V. Jawahar. We are very happy that the presenter in the awarding ceremony was Mrs. Yukiko Nakano.

(Continued on page 23)

## Keynote lectures



*Prof. Rangachar Kasturi*



*Prof. Toshiro Kamiuchi*

## Tutorials



*Prof. Thomas Breuel*



*Dr. Apostolos Antonacopoulos*

## IAPR Nakano Award for the Best Paper



*Mrs. Yukiko Nakano,  
presenter*



*Prof. Andreas Dengel,  
co-recipient*

(Continued from page 22)

Traditionally, the DAS workshop has a special discussion session coordinated by Prof. Henry Baird (Lehigh University, USA). This time, we discussed:

- Layout analysis and segmentation (Moderator: Mudit Agrawal, Scribe: Dimosthenis Karatzas),
- Digital libraries and historical documents (Moderator: Simone Marinai, Scribe: Martin Lettner),
- Camera-based DAS (Moderator: Thomas Breuel, Scribe: Seiichi Uchida),
- Adaptive and self-improving DAS (Moderator: Andreas Dengel, Scribe: Pingping Xiu),
- Handwriting recognition (Moderator: Marcus Liwicki, Scribe: Alicia Fornes),
- Multilingual DAS (Moderator: Premkumar Natarajan, Scribe: Chang An),
- Architecture of complete DAS (Moderator: Prateek Sarkar, Scribe: Michael Moll).

Each group confirmed the definition of the topic and discussed solved and unsolved (open) problems. The discussion summary was presented by the moderator or the scribe of each group in the report session.

The information about the final report of the discussion, lecture & tutorial movies, etc. will be announced at the DAS2008 webpage: [www.u-pat.org/das08/](http://www.u-pat.org/das08/), soon.

Finally, we would like to express our sincere thanks to 103 reviewers, 31 members of the

Program Committee, and the members of the Organizing Committee Masakazu Iwamura, Shinichiro Omachi, and Seiichi Uchida) for their various contributions. We are very much looking forward to the next DAS workshop.

The proceedings of DAS 2008 are published by IEEE-CS and can be found at :

[ieeexplore.ieee.org/xpl/RecentCon.jsp?punumber=4669929](http://ieeexplore.ieee.org/xpl/RecentCon.jsp?punumber=4669929)

Materials and Statistics from DAS 2008, including presentation slides and tutorial movies are available at:

[www.u-pat.org/das08/stats.shtml](http://www.u-pat.org/das08/stats.shtml)

# Of interest...

## Free Books!

IAPR Newsletter is looking for a reviewer for the book listed below.

If you have interest and some knowledge in the topic, email us with your mailing address. We will send you a copy of the book—which you may keep—and will expect in return a review for the *Newsletter*.

[Alexandra Branzan Albu](#), IAPR Newsletter *Editor*

*The Handbook of Texture Analysis*, Mirmehdi, Xie, and Suri, eds. (Imperial College Press, Dec 2008)  
Publishers web site: [www.icpress.co.uk/compsci/p547.html](http://www.icpress.co.uk/compsci/p547.html)

## CALL FOR CHAPTERS/PAPERS

**for a proposed book:**

***Advances in Pattern Recognition and Machine Vision—Principles and Applications***

May, 2010, marks the 25th anniversary of Professor King-Sun Fu's passing away. Prof. Fu was a pioneer in pattern recognition research and was one of the founders of IAPR and served as its first president.

An edited book is being prepared in honor of Prof. Fu, and you are most welcome to join this project by contributing a chapter/paper.

The tentative title of the book is: *Pattern Recognition, Machine Vision, Principles and Applications*. Topics include, but are not limited to, Pattern Recognition, Artificial Intelligent, Machine Vision, Imaging Processing, Biometrics, Personal Identification and Security, Machine Learning, and Cybernetics. The proposed book is to have a wide audience, including those in academia, industry, business application, and government laboratories. Each chapter will cover background on the topic and the major research results.

The following is the planned schedule:

March 5, 2009:	Title/abstract of the paper
June 15, 2009 :	first draft of the paper (limited to 15 pages single space, including figures, tables, and references).
September 1, 2009 :	2nd draft of the paper
December 1, 2009:	Final draft due

Please kindly reply by March 5, 2009 to Prof. Patrick S.P. Wang (USA) [pwang@ccsc.neu.edu](mailto:pwang@ccsc.neu.edu)

Yes, I accept your invitation: Name, affiliation, email/telephone, and proposed chapter topic/title

No, sorry I cannot accept your invitation, but would like to recommend the following professional(s):  
Name, affiliation, contact email/telephone.

An early response from authors is greatly appreciated.



# Conference Planner

NOTE: This is not an exhaustive list of conferences. It is a list of conferences sponsored or endorsed by IAPR plus additional conferences that have been brought to the attention of the editor (these non-IAPR events are denoted with an \*). The [IAPR web site](#) has more up-to-date information about [IAPR conferences](#) and a link to USC's Institute for Robotics and Intelligent Systems list of [Computer Vision Conferences](#)

~ (A. Branzan Albu, ed.)

Highlighting indicates that paper submission deadline has not yet passed.  
An asterisk \* denotes a non-IAPR event.

2009			
<a href="#">IMTA-2009</a> *	<i>2nd International Workshop on Image Mining. Theory and Applications</i>	Lisboa, Portugal	7 Feb 09
<a href="#">CCIW09</a>	<i>2nd Computational Color Imaging Workshop</i>	Saint Etienne, France	26-27 Mar 09
<a href="#">OAGM/AAPR 2009</a> *	<i>33rd Workshop of the Austrian Association for Pattern Recognition</i>	Stainz, Austria	14-15 May 09
<a href="#">PRIP 2009</a>	<i>10th International Conference "Pattern Recognition and Information Processing"</i>	Minsk, Belarus	19-21 May 09
<a href="#">MVA 2009</a>	<i>IAPR Conference on Machine Vision Applications</i>	Yokohama, Japan	20-22 May 09
<a href="#">CRV 2009</a>	<i>Sixth Canadian Conference on Computer and Robot Vision</i>	Kelona, British Columbia, Canada	25-27 May 09
<a href="#">CORES 2009</a>	<i>6th International Conference on Computer Recognition Systems</i>	Jelenia Góra, Poland	25-28 May 09
<a href="#">GbR 2009</a>	<i>7th IAPR - TC-15 Workshop on Graph-based Representations in Pattern Recognition</i>	Venice, Italy	26-28 May 09
<a href="#">ICB 2009</a>	<i>3rd International Conference on Biometrics</i>	Alghero, Italy	2-5 Jun 09
<a href="#">MCS 2009</a>	<i>8th International Workshop on Multiple Classifier Systems</i>	Reykjavik, Iceland	10-12 Jun 09
<a href="#">IbPRIA 2009</a>	<i>4th Iberian Conference on Pattern Recognition and Image Analysis</i>	Póvoa de Varzim, Portugal	10-12 Jun 09
<a href="#">SCIA 2009</a>	<i>16th Scandinavian Conference on Image Analysis</i>	Oslo, Norway	15-18 Jun 09
<a href="#">ICDAR 2009</a>	<i>10th International Conference on Document Analysis and Recognition</i>	Barcelona, Spain	26-29 Jul 09
<a href="#">ICVSS 2009</a> *	<i>International Computer Vision Summer School Machine Learning for Computer Vision</i>	Sicily, Italy	6-11 Jul 09
<a href="#">GREC 2009</a> *	<i>8th International Workshop on Graphics Recognition</i>	La Rochelle, France	22-23 Jul 09
<a href="#">IWCF09</a> *	<i>3rd International Workshop on Computational Forensics</i>	The Hague, The Netherlands	13-14 Aug 09
<a href="#">CAIP 2009</a>	<i>13th International Conference on Computer Analysis of Images and Patterns</i>	Münster, Germany	2-4 Sep 09
<a href="#">PRIB 2009</a>	<i>4th IAPR International Workshop on Pattern Recognition in Bioinformatics</i>	Sheffield, United Kingdom	7-9 Sep 09
<a href="#">ICIAP 2009</a>	<i>15th International Conference on Image Analysis and Processing</i>	Vietri sul Mare, Salerno, Italy	8-11 Sep 09
<a href="#">CIARP 2009</a>	<i>14th Iberoamerican Conference on Pattern Recognition</i>	Guadalajara, México	15-18 Nov 09
2010			
<a href="#">ICPR 2010</a>	<i>20th International Conference on Pattern Recognition</i>	Istanbul, Turkey	23-26 Aug 10
<a href="#">ICFHR 2010</a>	<i>12th International Conference on Frontiers in Handwriting Recognition</i>	Kolkata, India	16-18 Nov 10