INTERNATIONAL ASSOCIATION FOR PATTERN RECOGNITION

IAPR Newsletter

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October 2009

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Calls for Papers

ANNPR 2010 4th International Workshop on Artificial Neural Networks in Pattern Recognition Cairo, Egypt Deadline: November 1, 2009 April 11-13, 2010	ICISP 2010 International Conference on Image and Signal Processing 2010 Trois-Rivieres, Quebec, Canada Deadline: January 22, 2010 June 30-July 2, 2010
MCS 2010 9th International Workshop on Multiple Classifier Systems Cairo, Egypt Deadline: November 19, 2009 April 7-9, 2010	S+SSPR 2010 Joint IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR2010) and Statistical Techniques in Pattern Recognition (SPR2010) Cesme, Izmir, Turkey Deadline: February 1, 2010 August 18–20, 2010
DAS 2010 Ninth IAPR International Workshop on Document Analysis Systems Cambridge, MA, USA Deadline: December 1, 2009 June 9–11, 2010	ICFHR 2010 *12th International Conference on* *Frontiers in Handwriting Recognition* Kolkata, India Deadline: February 15, 2010 November 16–18, 2010
CIP 2010 2nd International Workshop on Cognitive Information Processing Elba Island (Tuscany), Italy Deadline: January 10, 2010 June 14-16, 2010	IWCF 2010 4th International Workshop on Computational Forensics Tokyo, Japan Deadline: June 25, 2010 November 11-12, 2010
ICPR 2010 *20th International Conference on Pattern Recognition* Istanbul, Turkey Deadline: January 15, 2010 August 23-26, 2010	ICDAR2011 11th International Conference on Document Analysis and Recognition Beijing, China Deadline: ? September 18-21, 2011

Call for Submissions to the IAPR Newsletter

Articles, announcements, book reviews, conference and workshop reports

Contact the editor: Alexandra Branzan Albu

Deadline: December 7, 2009

IAPR Newsletter

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Feature

Global Pattern Recognition Series:

Visual Computing in Darmstadt Germany: Fraunhofer IGD

www.igd.fraunhofer.de/

By
Arjan Kuijper (Germany)

This article continues the Global Pattern Recognition *series that focused initially on national laboratories.*

I would also like to note that Arjan Kuijper has joined the IAPR Newsletter *staff as its Book Reviews Editor. (Please see related article).*

~Alexandra Branzan Albu, ed.

"Hm. What kind of company is that, Fraunhofer IGD", was my first thought when I was told that they had a job opening in research coaching & management. As a "die-hard" academic scientist, I wasn't that keen on "shifting from academics to industry". Well, actually that didn't happen, although I started at Fraunhofer IGD last year.

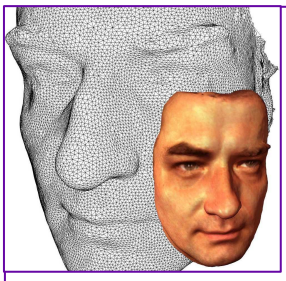
Fraunhofer

The first reaction of most people in my environment is "hey - aren't those the people who invented the MP3 format?" Yes, indeed, they did – well, it was at another institute, but nevertheless, when you buy your MP3s I now also benefit from the royalties! The success story of MP3 is a template of the way of working of the Fraunhofer Gesellschaft (group).

In 1814, Joseph von Fraunhofer invented the spectroscope, and discovered 574 dark lines appearing in the solar spectrum. These were later shown to be atomic absorption lines. These lines are still called Fraunhofer lines in his honour (see also en.wikipedia.org/wiki/Joseph_von_Fraunhofer). Later he became director of the Optical Institute at Benediktbeuern, a secularised Benedictine monastery devoted to glass making, where he had discovered how to make the world's finest optical glass and invented incredibly precise methods for measuring dispersion. In his spirit, the close to 60 Fraunhofer institutes perform applied scientific research building bridges between industry and academia.

Darmstadt

One of the institutes, Fraunhofer IGD, is located in Darmstadt, a bit south of Frankfurt with its huge international airport (for those familiar with international flights, but lacking some detailed geography of Germany!). Together with several groups at the Technical University of Darmstadt, Fraunhofer IGD



3D Face
The International Civil Aviation Organization (ICAO) seeks for technologies and processes that are suitable for automated self-identification at international borders that will enable unattended border crossing. The performance of 2D face recognition is not satisfactory by far because it is very sensitive to pose variation, illumination situation, and other disturbance factors. Moreover there are no reliable mechanisms for liveness detection and protection against spoofing and identity hiding attacks. The 3D Face project is focused on 3D face recognition technology research, including fusion with 2D face recognition technologies, and its application in secure environments.

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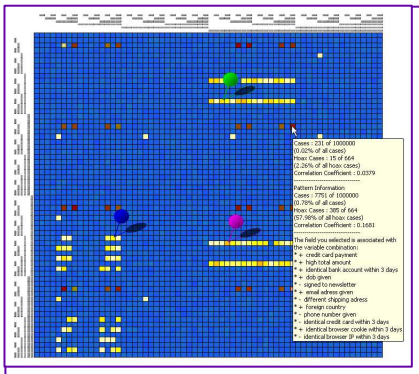
forms a centre of Visual Computing, working on all aspects of computer vision, learning, graphics, and pattern recognition. They publish their work in the major journals and present it at important conferences – a reason for me to move here as I am also affiliated to the Technical University of Darmstadt! One of the groups is headed by the director of Fraunhofer IGD, guaranteeing a steady flow of state-of-the-art methodologies and relevant applications in both directions – a standard Fraunhofer construction, by the way.

Not only do we visit conferences, we also organise them. For instance, September 22-24, 2010, the 32nd annual pattern recognition symposium of the German Association for Pattern Recognition, the German section of the IAPR, will take place in Darmstadt – see *www.dagm2010.org/* for more details. It would be a great opportunity to see what is going on here! If those dates don't fit, you can visit us October 15-17, 2010, during the 6th International Conference on Intelligent Information Hiding and Multimedia Signal Processing IIHMSP 2010, *bit.kuas.edu.tw/~iihmsp10/*.



KVMap

KVMap is a visual analysis technique that allows the interactive analysis of large data sets having many attributes within one graphical display. Success depends on having the right information at the right time. One of the biggest challenges in business intelligence today is to utilize the immense amounts of data that are growing at a faster rate every day. How can you turn this massive data into reliable and relevant information for your business?
Our technology KVMaps specifically addresses the initial questions when encountering large and complex data sets: What attributes of the data are relevant for me and my task? How do these attributes depend on each other? Ideally, you want to able to answer these questions without knowing all the details in your data.

TUD

If you don't want to wait until 2010, let me first give a brief overview of some recent work of the TU groups at Computer Science that work on Visual Computing. Their research focuses on the detection of people / pedestrians / objects and recognition of activities. Furthermore, we have parallel computing, investigating multi-view stereo for large image collections like Flickr, and statistical structure learning. Besides these topics, we have groups working on visual analytics and medical computing. To find out more, just Google for the names Schiele, Schindler, Roth, or Goesele in combination with Darmstadt (and feel free to Google me as well!).

Fraunhofer IGD: Vision

As is already clear from the previous section, a large spectrum of visual computing is covered in Darmstadt. As IGD stands for "Institut für Graphische Datenverarbeitung" – Institute for Computer Graphics Research, you can imagine that Computer Graphics is an important research topic – also at the TU. You're right. That's how it started, but nowadays the scope of the institute has become much broader.

Traditionally, *Computer Graphics*, with topics like virtual and augmented reality, rendering, and visualization, has been separated from *Computer Vision*, dealing with pattern recognition, image segmentation, and image understanding. One can think of the former as *using* a model and the latter as trying to *find* one. Nowadays, almost all the current challenges in research and industry appear at the interface and in the interdependency of graphics and vision. It is therefore one of the three research lines of Fraunhofer IGD: *Confluence of Graphics and Vision*.

Another research line, *Semantics in the Modeling Process,* extends the classical level-of-detail approach in modeling to the inclusion of a semantic level-of-detail. For instance, when a car is modeled, it should be clear at all description levels (e.g. wheels) that we

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are dealing with a car and not a motorbike. Therefore, a new approach to modeling including a semantic level-of-detail besides the classical level-of-detail is required.

The third line is *Generalized Digital Documents.* In the context of classical documents, we address questions which cannot even be worded clearly in the context of multimedia data. For instance, a thumbnail might be agreed upon as the abstract of an image. But the definition of the abstract of a complex 3D model or a video is not clear in an application independent sense.

Research areas

These three research lines are found in the individual departments in Darmstadt that focus on interactive multimedia appliances, industrial applications, real-time solutions for simulation and visual analytics, virtual and augmented reality, graphic information systems, 3D knowledge worlds and semantics visualization, cognitive computing & medical imaging, and security technology.

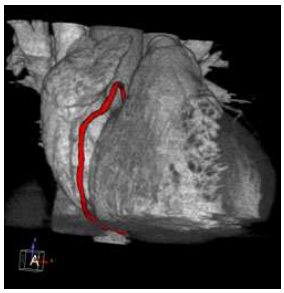
Next to those there are Fraunhofer IGD branches in Rostock, Singapore, and Graz (Austria) with interests in scientific and medical visualization, environments for life sciences, virtual and augmented environments for medical applications, new media for education and cultural heritage, 3D modeling and reconstruction of incident scenes, teaching and learning with the internet and new media, perceptive and affective applications which assist and support people in their job or leisure time, and maritime graphics.

Outlook

So what does this nice broad list of research areas tell us? Well, for instance that a lot of interesting research is going on, inspired by developing computing possibilities. Think big! Traditional pattern recognition areas like irises and fingerprints are of importance to security technology, e.g. an integrating person recognition system that may partially replace passport

Coronary Artery Analysis

The coronary arteries lie on the outer surface of the cardiac muscle and ensure the heart's blood supply. A detection of narrowed areas, so-called stenoses, is of vital importance for an early detection of heart failure risk. The software of Fraunhofer Institute for Computer Graphics Research IGD is a vessel analysis tool for the radiologist. It uses CT angiography (CTA) data of high spatial resolution with approximate 0.5 mm x 0.5 mm x 0.5 mm voxel size and helps to examine the coronary arteries in an automatic manner.



Vessel Extraction

A special segmentation algorithm has been developed that extracts the vessel border and its centreline simultaneously. The required user input consists of the definition of three positions that all have to lie inside the artery to be segmented:

* the start point (distal position)
* a second point more or less proximal to the first in order to define the initial direction
* the end point (typically inside the aorta)

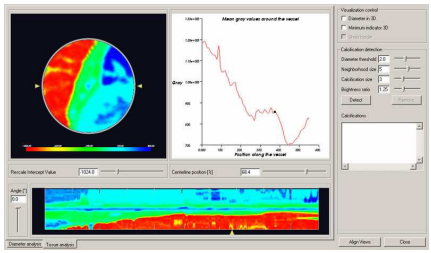
Once these positions have been defined, the segmentation runs autonomously. The output of this extraction step is one set of points representing the border and a second one describing the vessel's centreline.

Vessel Analysis

The analysis of coronary arteries uses contrast-enhanced CT data and is a true 3D approach that features the following:

* vessel's diameter
* the position of hard plaques
* the generation of arbitrary multi-planar reformations (MPR)
* isolated rendering of the vessel

It is based on the segmentation of a single vessel that extracts the vessel's centerline as well as its border.



The analysis results are presented in a separate window. A color-coded tissue classification is provided - showing air in red, fat in green, muscle tissue in light blue and contrast agent filled cavities and calcifications in intense blue color.

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checks at airports. Or one would like to find certain (a priori undefined) patterns in huge (visualized) data sets. Medical computing still needs appropriate algorithms. Cultural heritage is booming. The amount of sensor-produced data is exploding – we need methods to analyze, visualize, and store them properly.

There's enough work to be done!

Other articles in the Global Pattern Recognition Series:

Getting to Know...
J.K. Aggarwal, IAPR Fellow

Recognition of Human Activities: A Grand Challenge

by J.K. Aggarwal (USA)

This article is the first in a new series, Getting to Know...IAPR Fellows. *This series was begun in response to the question posed by Walter Kropatsch, IAPR Fellow, in the last issue of the* IAPR Newsletter, *"How many IAPR Fellows do you know?".*

I invite all IAPR Fellows to contribute to this exciting new series.

~Alexandra Branzan Albu, ed.

Computer Vision has matured from a research topic in the early 60's to a mature field of research and application. Today, computer vision, image processing, and pattern recognition are addressing many societal and technological problems. The recent desire to monitor people and their activities has led to an added interest in human activity recognition. Security and surveillance applications span monitoring persons in a subway, an airport, a bus station, and a parking lot to observing persons in a wide area from a camera mounted on an unmanned aerial vehicle (UAV). Monitoring the elderly in a 'smart' home equipped with multiple cameras and other sensors is a different flavor of an application. Analysis and understanding of sports video is still another flavor of monitoring. The content-based video summarization and retrieval, especially useful to video sharing websites, is again an area with ties to human activity recognition. The movie industry is interested in synthesizing a given person's actions and gait based on a model video of the person. The added constraint in many applications is the need for real time delivery of the end product of processing, analysis, and understanding.

Advances in several technologies have also stimulated this growth in interest and the speed with which the applications have been adopted. Cameras come in all different sizes, shapes, and prices. You can have cameras that are very small to cameras that produce very high quality images of distant subjects. PTZ cameras with remotely controllable pan, tilt, and zoom capability are readily available. One can use infra red cameras (a bit expensive) for night applications. Memory has become relatively inexpensive and computers have become relatively

J. K. Aggarwal is on the faculty of The University of Texas at Austin College of Engineering and is currently a Cullen Professor of Electrical and Computer Engineering and Director of the Computer and Vision Research Center. His research interests include computer vision, pattern recognition and image processing focusing on human motion. A Fellow of IEEE (1976), IAPR (1998) and AAAS (2005), he received the Senior Research Award of the American Society of Engineering Education in 1992, the 1996 Technical Achievement Award of the IEEE Computer Society and the graduate teaching award at The University of Texas at Austin in 1992. More recently, he is the recipient of the 2004 K S FU prize of the International Association for Pattern Recognition, the 2005 Kirchmayer Graduate Teaching Award of the IEEE and the 2007 Okawa Prize of the Okawa Foundation of Japan.. He is a Life Fellow of IEEE and Golden Core member of IEEE Computer Society. He has authored and edited a number of books, chapters, proceedings of conferences, and papers.

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fast and inexpensive. One can buy an 'off the shelf' system that connects to your home computer, and one can monitor one's home from a laptop over the internet. So the technology is providing an additional boost to the computer vision applications.

Contemporary researchers are addressing new problems, for example, the recognition of human activities from a UAV based camera where the moving platform poses some difficult problems. At the same, time others are continuing to work on older problems, like recognizing pedestrians in a cross-walk from a moving vehicle for assistance in timely stopping of the vehicle. Images with limited resolution and low contrast pose serious low level image processing difficulties. In addition to monitoring people, one is naturally interested in the interaction of persons in a scene, the behavior of a crowd, and the possible interaction of a person with movable objects like a piece of luggage or an unmovable object like a fence or a wall. So working on recognition of human activities has some very challenging and interesting ongoing research.

Before one reaches the stage of high level processing like understanding an activity, many low level image processing steps in a long chain of steps must be performed. In general, these steps pose severe challenges in themselves. It is not the intention of the author to soft pedal the difficulties associated with low level processing. A cursory look at the images obtained, for example, in a subway station without the benefit of bright lights will convince a person that low level segmentation is a serious problem. In addition, surveillance is a 24/7 problem, including night-time, rain, and fog if one is outdoors.

In general, the duration of an activity varies with its type of activity and is normally a continuous chain of events and not a singleton event. Given that our recognition methodologies are bottom up in the sense that we recognize "micro activities" or "actions" and then build a concatenation of such recognitions to recognize an activity, several researchers have adopted to segment an activity at different levels. Earlier the paradigms of 'change, event, verb, episode, history'; 'movement, activity and action'; and 'agent, motion, target' were used to segment different activities. Our group has developed a more flexible context free grammar based description of activities. This has the advantage of describing an activity at a level of detail based on the problem under consideration.

At a gross level a person is represented as a blob – the level of understanding attainable at this level of granularity is limited to gross level description of motion and activity. One may describe actions like depart, follow and meet, construct a system that distinguishes between the motion of a person, bicycle and a vehicle based on the blob and recognize certain football actions between players. For certain applications this is adequate. In fact, if one is trying to avoid actual recognition of a person to conform to privacy issues, these techniques are particularly useful.

At the next level, a person is represented by body parts namely head, torso, arms legs, hands and feet. A number of methods have been proposed to address the segmentation of body into various parts. At times, one is interested in determining the major body joints or the extremities of the body since they carry a wealth of information about the activity being performed by the entire body. Semantic recognition of activities based on various body parts has produced some very good results that range from the recognition of simple activities to the recognition of fighting and recursive activities as continued fighting. The context of the activity is playing an important role in recognition of human activity.

A variety of methodologies are being pursued and one may impose a number of taxonomies to gain insight into methods and results. One such taxonomy is based on dividing the methods into two classes -

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single layer or hierarchical approaches. If it is a single layer approach, it may be divided into two cases: space-time or sequential. In the case of hierarchical approaches, recognizing higher levels of activity is based on simpler sub-events related to the activity. The common parts are reused again in constructing the description of the overall activity.

A general purpose recognition that can provide a semantic description of diverse human activities is far in the future. Most researchers have focused on special purpose systems addressing particular problems and considered single person activities and or two person interactions or crowd activities. The moving light display experiment of Johansson [1] certainly inspired neuroscience and computer vision based studies of human motion. It motivated Webb [2] to study human motion. An earlier review by the author [3] and more recent reviews by Garvila [4], Cedras and Shah [5] and Turga et al [6] provide an overview of the state of art. A paper outlining a different direction is presented by Ryoo [7]. This short review is presented with the idea of enticing the reader toward further reading and possibly embarking on research in this area.

Several problems of computer vision / human activity recognition have proved to be difficult to solve. We have certainly made headway but a solution ala R2D2 is still far in future. Designing and building a system to detect and possibly prevent the drowning of a person in the neighborhood pool or the backyard pool would be a great contribution. Detecting a person having a heart attack in hotel room while alone would be a great boon. The problem of estimating intentions of a person from his appearance and outward behavior tickles our imagination at this time. These are difficult problems and I consider them to be the grand challenges of Human Activity Recognition. It is fair to assume that some of these problems would be solved in the near future.

References:

[1] G. Johansson, 'Visual perception of biological motion and model for analysis," *Perception Psychophysics,* vol.14, no.2, pp.201-211, 1973.

[2] Jon A. Webb and J. K. Aggarwal, "Structure from Motion of Rigid and Jointed Objects" *Artificial Intelligence,* vol. 19, pp. 107-130 1982.

[3] J. K. Aggarwal and Q. Cai, "Human Motion analysis: A review," *Computer Vision and Image Understanding,* vol.73, no. 3, pp. 428-440, 1999.

[4] D. M. Gavrila, "The visual analysis of human movement: A survey," *Computer Vision and Image Understanding,* vol. 73, no.1, pp. 82-98, 1999.

[5] C. Cedras and M. Shah, "A Motion-based recognition: A survey," *Image and Vision Computing,* vol. 13, no.2, pp. 129-155, 1995.

[6] Pavan Turga, Rama Chellappa, V. S. Subrahmanian and Octavian Udren, " Machine Recognition of Human Activities: A survey," IEEE Transactions on Circuits and Systems for Video Technology, vol.18, no.11, pp. 1473-1488, 2008.

[7] M. S. Ryoo and J. K. Aggarwal, "Semantic Representation and Recognition of Continued and Recursive Human Activities" *International Journal of Computer Vision,* vol. 82, pp. 1-24 2009.

News from the
IAPR Executive Committee

By Denis Laurendeau (Canada)

The ExCo has taken actions decided during its meeting of July, 2009, in Nancy. The different committees (Standing and Technical) have been given feedback on the interim reports that had to be submitted before the meeting in preparation for the next months preceding the next ICPR 2010 in Istanbul. SCs and TCs will also be contacted with respect to the strategy that is being contemplated for offering improved web services to the IAPR community.

Speaking of ICPR 2010, members of the IAPR community are invited to visit the conference website (*www.icpr2010.org/*) since deadlines for submitting papers, workshops and tutorials are approaching very quickly.

The Chairs of the King-Sun Fu and J.K. Aggarwal Prizes have been contacted for announcing the Call for Nominations for the prizes. Nomination forms for the K-S Fu award are available at *www.iapr.org/fellowsandawards/awards_kingsunfu.php* while the forms for the J.K. Aggarwal prize can be found at *www.iapr.org/fellowsandawards/awards_aggarwal.php*.

The Chair of the Fellow Committee, Prof. Walter Kropatsch, IAPR Fellow, has sent a call for nominations for IAPR fellows. The electronic form for submitting candidates for IAPR fellowship as well as the endorsement form can be found at the following address *www.iapr.org/fellowsandawards/?ar=4*. The deadline for submitting nominations and endorsements is November 28, 2009.

The Chair of the Advisory Committee and co-founder of the IAPR, Prof. Herbert Freeman, IAPR Fellow, kindly agreed to update the history of the IAPR. Prof. Freeman submitted a first draft of the document to the ExCo in September, 2009. The reading of this document is captivating and is definitely a “page turner” for those interested in the creation of the IAPR and in the creation of learned societies in general. This important document on the IAPR can be viewed from the IAPR web site.

Associate Editor for Book Reviews

Arjan Kuijper (Germany)
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Home page: ***www.igd.fraunhofer.de/~akuijper/***

Please see Arjan's Feature article on Fraunhofer IGD in this issue. *~Alexandra Branzan Albu, ed.*

Alexandra asked me to briefly introduce myself as the new associate editor for book reviews—so let's give it a not-too-boring try. I did an MSc in applied math at Twente University in the Netherlands, with a thesis on image enhancement using partial differential equations at the Dutch Forensic Laboratory (1995). After a short period in industry as software engineer for handheld computers issuing parking fines. (I made a lot of friends there!) I did a PhD at Utrecht University on image understanding using Gaussian scale space with some medical context (under supervision of *IAPR Fellow* Viergever; 2002).

I then moved to Denmark, were I was an assistant research professor at the IT University in Copenhagen, working on shapes, symmetry sets, and medial axes. After three years, it was time to move again—this time to Austria, as senior researcher at the Johann Radon Institute for Computational and Applied Mathematics (RICAM) in Linz, a part of the Austrian Academy of Sciences. Here I continued my work on image processing and understanding using PDEs (and got to know *IAPR Fellow* Kropatch —Fellows are everywhere! Get to know *IAPR Fellow* Aggarwal in *related article in this issue*).

One year ago, I started as research coach at Fraunhofer IGD (and external lecturer at the Technical University Darmstadt) in Darmstadt, Germany (*see related article*). It basically means that I supervise employees who are in a PhD track, and help them with publishing papers & writing their theses.

Why the BooksBooksBooks?

I had the privilege to travel around a bit, see different universities, countries, and IAPR member societies. And yes, the Dutch, Danish, Austrian, and German ones are all different, but they share the philosophy that researchers in Pattern Recognition, Computer Vision, and Image Processing need each other (guess they checked *www.iapr.org/aboutus/* !). Of course, conferences like the ICPR and the ones organised by the national chapters are extremely important in getting to know each other better.

Just as import is to learn what is happening in pattern recognition and allied branches. Besides proceedings, books are an essential tool in this process. Obviously, getting to know a related research area better by "randomly" reading books that describe it, is a sub-optimal solution.

I therefore appreciate the *IAPR newsletter* with its three main parts:

- INSIDE the IAPR where you can read more about "hot issues".
- Conference and workshop reports, giving insight in what IAPR is all about—and in which proceedings you can read more about the state of the art.
- BooksBooksBooks, where your colleagues review new books—with very likely more relevant information than the back cover of the book, or the publisher's advertisement.

I'm looking forward to serving you by coordinating reviews of books that describe a variety of interesting topics. And of course: if you know a book you'd like to review: let me know!

BOOKSBOOKSBOOKS

Book reviews previously published in the IAPR Newsletter

Handbook of Texture Analysis by Majid Mirmehdi, Xianghua Xie, and Jasjit Suri, editors (reviewed in this issue)

Markov Random Field Modeling in Image Analysis By Stan Z. Li (reviewed in this issue)

Pattern Recognition and Neural Networks by B.D. Ripley Apr '09

Close Range Photogrammetry: Principles, Methods, and Applications by Luhmann, Robson, Kyle, and Harley, Oct '08

Classification and Learning Using Genetic Algorithms: Applications in Bioinformatics and Web Intelligence by Bandyopadhyay and Pal, Oct '08

Learning Theory: An Approximation Theory Viewpoint by Cucker and Zhou, Oct '08

Character Recognition Systems—A Guide for Students and Practitioners by Cheriet, Kharma, Liu, and Suen, Oct '08

Geometry of Locally Finite Spaces by Kovalevsky, Oct '08

Machine Learning in Document Analysis and Recognition by Marinai and Fujisawa (Editors), Oct '08

*From Gestalt Theory to Image Analysis—A Probabilistic Approach b*y Desolneux, Moisan, and Morel, Oct '08

Numerical Recipes: The art of scientific computing, 3rd ed. by Press, Teukolsky, Vetterling and Flannery, Jul '08

Feature Extraction and Image Processing, 2nd ed. by Nixon and Aguado, Jul '08

Digital Watermarking and Steganography:Fundamentals and Techniques by Shih, Jul '08

Springer Handbook of Speech Processing by Benesty, Sondhi, and Huang, eds., Jul '08

Digital Image Processing: An Algorithmic Introduction Using Java by Burger and Burge, Jul '08

Bézier and Splines in Image Processing and Machine Vision by Biswas and Lovell, Jul '08

Practical Algorithms for Image Analysis, 2 ed. by O'Gorman, Sammon and Seul, Apr '08

The Dissimilarity Representation for Pattern Recognition: Foundations and Applications by Pekalska and Duin, Apr '08

Handbook of Biometrics by Jain, Flynn, and Ross (Editors), Apr '08

Advances in Biometrics – Sensors, Algorithms, and Systems by Ratha and Govindaraju, (Editors), Apr '08

Dynamic Vision for Perception and Control of Motion by Dickmanns, Jan '08

Bioinformatics by Polanski and Kimmel, Jan '08

Introduction to clustering large and high-dimensional data by Kogan, Jan '08

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The Text Mining Handbook by Feldman and Sanger, Jan ‘08

Information Theory, Inference, and Learning Algorithms by Makay, Jan ‘08

Geometric Tomography by Gardner, Oct ‘07

“Foundations and Trends in Computer Graphics and Vision” Curless, Van Gool, and Szeliski., Editors, Oct ‘07

Applied Combinatorics on Words by M. Lothaire, Jul ‘07

Human Identification Based on Gait by Nixon, Tan and Chellappar, Apr ‘07

Mathematics of Digital Images by Stuart Hogan, Apr ‘07

Advances in Image and Video Segmentation Zhang, Editor, Jan ‘07

Graph-Theoretic Techniques for Web Content Mining by Schenker, Bunke, Last and Kandel, Jan ‘07

Handbook of Mathematical Models in Computer Vision by Paragios, Chen, and Faugeras (Editors), Oct ‘06

The Geometry of Information Retrieval by van Rijsbergen, Oct ‘06

Biometric Inverse Problems by Yanushkevich, Stoica, Shmerko and Popel, Oct ‘06

Correlation Pattern Recognition by Kumar, Mahalanobis, and Juday, Jul. ‘06

Pattern Recognition 3rd Edition by Theodoridis and Koutroumbas, Apr. ‘06

Dictionary of Computer Vision and Image Processing by R.B. Fisher, et. Al, Jan. ‘06

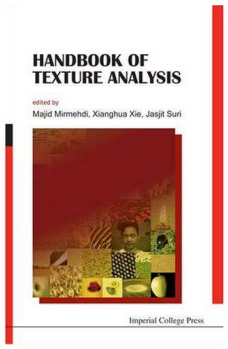
Kernel Methods for Pattern Analysis by Shawe-Taylor and Cristianini, Oct. ‘05

Machine Vision Books Jul. ‘05

CVonline: an overview, Apr. ‘05

The Guide to Biometrics by Bolle, et al, Jan. ‘05

Pattern Recognition Books, Jul. ‘04



Handbook of Texture Analysis

by Majid Mirmehdi, Xianghua Xie, and Jasjit Suri, editors

Imperial College Press, 2008

Reviewed by
Egon L. van den Broek (The Netherlands)

Although handbooks on image processing depict texture as an important characteristic for various applications, handbooks on texture analysis are rare. Two exceptions are the books of Pietikainen (2000) and Petrou and Sevilla (2006). With the *Handbook of Texture Analysis* by Majid Mirmehdi, Xianghua Xie, and Jasjit Suri, a new one is launched, which aims to "bring together a collection of defining works that span the breadth of knowledge in texture analysis" (p. v). This review discusses how far this aim has indeed been achieved.

Before having read the book's content, three concerns should be mentioned:

The publisher has chosen to print the book in a beautiful manner. It is full color print, which is indeed good for a book including various images of colorful textures.

The book is an edited volume. Consequently, it was possible to incorporate contributions of many of the grant names in texture analysis.

Although a compilation of the chapters' references would result in an impressive number of references. Various references are missing; for example, from the Journal of the Optical Society of America (JOSA). Moreover, this illustrates an important limitation of the book: its limited scope.

With this review, we will briefly denote each of the chapters and add a critical note to them. Where applicable, we will cluster the chapters. After this, we will provide some conclusions, trying to refrain from any bias. Hence, you as reader can decide yourself whether or not the book would be of value to you.

The first chapter provides a gentle introduction to texture analysis. In parallel, it provides a feeling for texture and explores / reviews some fundamental techniques. In this line, Chapter 2 provides a compact overview of texture synthesis, through discussing 18 milestone papers.

Chapters 3, 4, and 5 describe methods for texture classification, representation, and analysis. In Chapter 3, Varma and Zimmerman describe work that followed their 2005 paper. Chapter 4 is an adapted reprint of the authors' IEEE PAMI (2007) paper, as they also indicate. Chapter 5 is an extension of one of the author's 2006 paper; see their ref. [41].

Chapters 6, 7, and 8 concern 3D Texture analysis. The first two of these chapters provide an excellent introduction on the topic. Moreover, both chapters are complementary, as they should be being a part of a handbook. The third of this triple discusses the same topic but approaches it from another angle.

Chapter 9 provides an introduction to the work of Doretto and Soatto on dynamic textures. With this they depict "certain temporal regularity properties" and discuss these in the context of time series analysis. This work is of use for video analysis.

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With Chapter 10, we get back to texture synthesis, with the introduction of an alternative approach; cf. Chapter 2. A method for a hierarchical description of textures is introduced. Regrettably, this chapter lacks the references to similar approaches. Nevertheless, it describes a convincing alternative method.

Chapter 11 provides an extensive tutorial on the Trace transform (i.e., a generalized Radon transform), as introduced in 2001. Since then, it has been often applied.

Chapter 12 is again a reprint of one of the authors' papers; see ref [12] of this chapter. It is the only chapter of the handbook on a specific application domain: face recognition. Hence, it presents a good illustration of the complications in a well-known application domain.

The book ends with Chapter 13: "A galaxy of texture features". This chapter provides a nice overview of texture features, although inevitably incomplete. Moreover it presents a taxonomy of texture analysis and a reference list, which contains many "must have read" articles. As such, it is one of the highlights of the book.

We have gone through the handbook, chapter by chapter. More than anything else, this illustrated the complexity of textures. For each element of texture research, as denoted in the handbook, it would be worth to compile a separate handbook. This is well illustrated through color-induced texture analysis, which is only briefly touched throughout the book, from time to time. Regrettably but not surprisingly since it should focus on the interaction between texture (features) and color, already a challenge on its own (Wyszecki & Stiles , 2000). Moreover, for various applications, still only gray scale images are processed. Nevertheless, if anything, I missed a more in depth discussion of this aspect of texture analysis.

Much more can be said on this handbook. However, this would go beyond the scope of a review such as this. Therefore, let us draw some final conclusions:

The handbook is biased toward the image processing/ computer vision community. Findings from other fields (e.g., psychology and optics) are addressed only to a limited extent.

Although not stated as such, roughly half of the handbook consists of reprints of papers. The other half of the chapters, are in a format one expects with a handbook. This is indisputably, a downside of the book.

Despite the critical notes made, this handbook is of value. Especially for those who want to get introduced to the topic of texture. For experts, it provides a nice overview of various aspects of texture.

The book's value is determined by the quality of the contributions, which are all of an excellent level.

However, possibly most important: there are few alternatives for this handbook. Hence, the book fills a hole in the market.

In a nutshell, we can conclude that the handbook satisfies the editors' claim (p. v). But more than anything else, one thing again becomes clear. Regrettably, as is frequently stated in this handbook, we still have to conclude: "Texture is not fully understood ..." (p. 37) So, the quest continues ...

References

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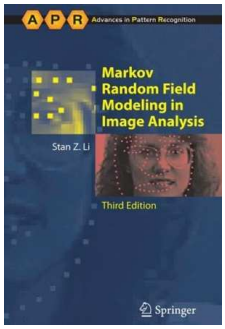
Pietikainen, M.K. (2000). *Texture Analysis in Machine Vision*. Singapore, Singapore: World Scientific Publishing Co. Pte. Ltd. ISBN: 978-9810243739

Wyszecki, G. & Stiles, W.S. (2000). Color science: Concepts and methods, quantitative data and formulae (2nd edition). New York, NY, USA: John Wiley & Sons, Inc. ISBN: 0-471-39918-3



Markov Random Field Modeling in Image Analysis

By Stan Z. Li
Springer, 2009

Reviewed by
Apostolos Georgakis (Sweden)

Markov Random Fields (MRF) is a mature region in the area of probability theory that finds applications in various signal processing and pattern recognition tasks MRF provides solutions to these tasks by building mathematical models using intrinsic characteristics of the underlying signal under some specific and well defined assumptions related to the nature of signal generation mechanism.

Prof. Li's book in MRF modeling for image analysis provides a comprehensive introduction to the area of MRF in general and to its applications in image processing in specific. The areas of interest are divided into two groups. One dealing with low-level tasks such as observation models; image restoration and reconstruction; and texture synthesis, analysis and segmentation. The second group deals with high-level tasks such as object-matching, recognition, and pose estimation. The book is very well written with a plethora of references for the reader that wants to delve further into specific areas. But the reader needs to be warned that some sections of the book are rather dense and are not intended for novice practitioners in the area.

Chapter 1 describes class labeling issues in image analysis and also gives a general review of various optimization approaches. The chapter closes with a thorough introduction in Bayes estimation theory and the *maximum a posteriori* (MAP)-MRF framework.

A common problem in stochastic modeling is the computational complexity for model generation. This issue is addressed in Chapter 2 which introduces the reader to the world of MRF and Gibbs distributions and, after presenting a brief proof on their equivalence, proceeds to show various types of models, among them multilevel logistic, multiresolution, hierarchical, *k-MRF,* and Nakagami models. The chapter closes with an equally import topic which is the smoothness assumption and the methods for assessing its energy content.

The next two chapters deal with *low-* and *high-level* MAP-MRF for image processing. There is extensive coverage on image restoration and reconstruction problems from noise-added surfaces under the smoothness condition. Then the focus passes from edge labeling problems—again under the smoothness constraint—to texture generation (modeling) where Metropolis and Gibbs samplers are introduced for texture segmentation. Optical flow and stereo vision problems are addressed using pixel labeling. Finally, Bayesian deformable models are described and extensive coverage is given to the EigenSnake algorithm along with an example on a face detection application. Object matching and pose estimation (high-level models) are examined under conditional constraints, at first, and subsequently using feature extraction. Multiple objects are also treated. This is a more realistic scenario but requires additional constraints, namely *between-* and *within-objects*.

Chapter 5 presents a realistic scenario where the smoothness assumption does not hold. Uniformity over the entire surface is non-realistic and undesirable

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along discontinuities. A regularization framework is introduced that punishes irregularities given *a priori* smoothness constraints. Other models presented in the chapter are the Discontinuity Adaptive (DA)-MRF model under the *Euler equation* and the set of variants to the standard Total Variation (TV) model.

The next two chapters deal with the core problem in MRF models which is parameter estimation. Firstly, the problem of outliers in the data is addressed using robust statistical methods such as *M*-estimator and its variant *AM*-estimator using annealing. Next, *maximum likelihood* (ML) parameter estimation is presented both for MRF and noise modeling. Computational complexities in ML are dealt with: pseudo-likelihood, mean field approximations, and least squares, among others. The issue of complexity is amplified in complex scenes with unlabeled data. For this reason, various solutions are proposed, among them the well-known Expectation-Maximization (EM) algorithm. The chapter closes with methods for estimating the number of MRF's.

What follows is a fine-tuning of the parameter estimation, presented earlier, for object recognition. Various criteria are presented (correctness, instability, and optimality) and estimators are given in a global energy minimization approach. Dimensionality reduction is also addressed.

The problem of finding a closed functional form for the optimal solution is discussed in chapter 9. Iterative techniques for finding local minima are given. Conditional modes under independence and Markovian assumptions are investigated. Minimization in discrete space is introduced using the *relaxation labeling* method. Dynamic and quadratic programming are also engaged in an effort to describe the global energy function. Finally Lagrange multipliers, Hopfield NN, and their combination are presented.

The last chapter of the book deals again with minimization issues but from a global perspective. *Simulated annealing* is introduced. Following is the *mean field annealing* which replaces the minimization of the MRF's energy function with the evaluation of the mean field. Another annealing alternative technique covered is *graduated nonconvexity*. Moreover *graph cuts* and *genetic algorithms* are discussed for labeling problems. The chapter closes with an extensive set of experimental results for various algorithms covered earlier in the book.

In conclusion, this book is very thorough, both in a mathematic and a descriptive manner. Anyone interested in image processing and its applications under an MAP-MRF setting can benefit from the variety of provided examples and its wide range of references.

Conference Report: SCIA 2009

16th Scandinavian Conference on Image Analysis

15-18 June 2009
Oslo, Norway

General Chair:
Kristin Klepsvik Filtvedt (Norway)

Report prepared by Arnt B. Salberg (Norway)

Proceedings of the conference have been published by Springer-Verlag in the Lecture Notes in Computer Science Series (Volume 5575).

The Scandinavian Conferences on Image Analysis is hosted in turn by the Scandinavian countries every second year, the first having been in Sweden in 1980. Following the long line of conferences, the16th in the series took place in Norway where 144 participants from 25 countries were gathered. The proceedings were published by Springer as a Lecture Notes in Computer Science (volume 5575), and were distributed to the participants at the conference. Kristin Klepsvik Filtvedt did a fantastic job as conference chair.

The program committee was chaired by Arnt-Børre Salberg. SCIA received 154 papers, and 79 were accepted as oral or poster presentations. The conference was organized as a single-track conference. The program covered high-quality scientific contributions within image analysis, human and action analysis, pattern and object recognition, colour imaging and quality, medical and biomedical applications, face and head analysis, computer vision, and multispectral colour analysis. The session on multispectral colour science was organized in cooperation with the 11th Symposium of Multispectral Color Science (MCS 2009). Since 2009 was proclaimed the “International Year of Astronomy” by the United Nations General Assembly, the conference also contained a session on the topic “Image and Pattern Analysis in Astronomy and Astrophysics”.

The conference was preceded by two interesting tutorials. The first tutorial “Principles and methods of image fusion” was given by Prof. Jan Flusser from The Institute of Information Theory and Automation, Czech Republic. The second tutorial “The Dissimilarity Representation for Pattern Recognition: Introduction and Examples” was held by Prof. Robert P. W. Duin, IAPR Fellow, from Delft University of Technology, The Netherlands.

We proudly presented the following IAPR keynote talks for the conference participants:

- "Video-based Modeling and Recognition of Human Actions" by Prof. Rama Chellappa, IAPR Fellow, University of Maryland, USA

- "Relevance from Gaze Patterns" by Prof. Samuel Kaski, Helsinki University of Technology, Finland

- "Complete Photoconsistency Optimization in Multi-View Stereo" by Prof. Peter Sturm, INRIA Rhône-Alpes, France

- "Computational Photography and Near Infrared: Improve the Visible with the Invisible" by Prof. Sabine Süsstrunk, Ecole Polytechnique Fédérale de Lausanne, Switzerland

"A Multiscale View of the Solar Atmosphere" by Prof. Peter Gallagher, Trinity College Dublin, Ireland

SCIA has a reputation of having a friendly environment, in addition to high-quality scientific contributions. We focused on maintaining this reputation by designing a technical and social program that we hope the participants found interesting and inspiring for new research ideas and network extensions.

Workshop Report: GREC 2009

8th IAPR International Workshop on Graphics Recognition

22-23 July 2009
La Rochelle, France

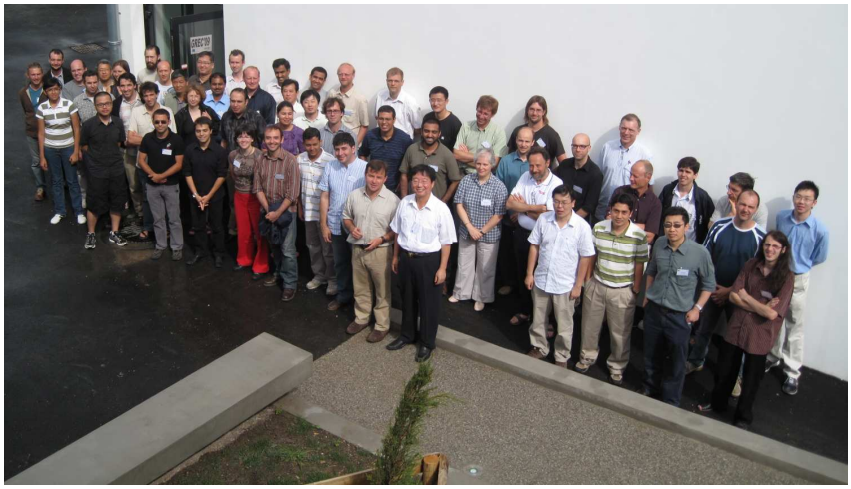
General Chair:

Jean-Marc Ogier (France)

Program Co-Chairs:

Liu Wenyin (China)
Josep Lladós (Spain)

Report prepared by the General Chair



The IAPR International Graphics Recognition Workshop (GREC) is the main activity of IAPR Technical Committee 10 (TC10) on Graphics Recognition. The eighth edition (GREC2009) was held in the City University of La Rochelle, La Rochelle (France), just before the 9th International Conference on Document Analysis and Recognition (ICDAR2009) held in Barcelona. GREC2009 was chaired by Jean-Marc Ogier, Liu Wenyin, and Josep Lladós. 45 valid papers were presented in the scientific program. The workshop had 70 registered participants from 23 countries, which represents a record of participation, since the first edition of this event.

Following the tradition of the previous workshops in the series, the scientific program was organized in a single-track 2-day workshop. It comprised 8 sessions dedicated to specific topics. Session topics included: Structural Approaches for Recognition and Indexing; Techniques Towards Vectorization; Sketching Interfaces and On-line Processing; Symbol and Shape Segmentation, Description and Recognition; Historical Documents Analysis; Indexing and Spotting; and Performance Evaluation and Ground Truthing. We aimed to restore the original GREC model, a true workshop with interaction rather than a mini-conference. From this point GREC 2009 was a big success, since the discussions were numerous and interesting for the community.

With this purpose, only extended abstracts were selected for the workshop, giving the opportunity to present works in any maturity stage. Electronic proceedings with full papers were available to registrants allowing “electronic” discussions prior to the workshop. Authors gave short presentations of 5 minutes, leaving time for panel discussions. The role of chairpersons was of key importance in this format.

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Session chairs were asked not just to introduce speakers, but to read papers before his/her session, and to prepare a survey presentation on the topic and a list of questions to foster active discussions, and encourage participation. Each session participant was also asked to read the papers of the same session and prepare some questions. Chairs did great jobs in preparing their corresponding sessions, and we had a really interactive workshop.

The last session of GREC2009 was a panel discussion chaired by Pr. Karl Tombre, and co-animated by Pr. Young Bin Kwon, and Dr. Ramachandrula Sitaram (senior researcher at HP Labs India), who gave an interesting point of view issuing from R&D companies. Karl Tombre prepared an excellent summary of the issues discussed during two days, and addressed the hot topics on the present and the future of Graphics Recognition. Selected and extended papers of GREC2009 will be published in a volume of the Springer LNCS series.

Continuing with the tradition of past GREC workshops, the program of GREC2009 included graphics recognition contests. In particular, two contests were organized, but unfortunately slightly postponed to September 15th in order to consolidate the preparation and the number of participants: an arc segmentation contest, organized Hasan S.M. Al-Khaffaf and Abdullah Zawawi Talib (USM, Malaysia), and a symbol recognition contest, organized by Philippe Dosch (LORIA, France), Ernest Valveny (CVC Spain), and Mathieu Delalandre (CVC Spain).

The GREC2009 participants had the opportunity to socialize thanks to a set of exciting social events: a sea cruise in the rain, followed by a tyrolean between the two old towers of La Rochelle, and ending with a splendid banquet in the Aquarium of La Rochelle. In order to consolidate GREC participant interactions, a touristic trip was also organized between La Rochelle and Barcelona, allowing the participants to reach the ICDAR (*see report in this issue*) event, in a convivial, cultural and friendly environment.

Concerning the next session, it was also the first time that we had two proposals for the next GREC (2011), highlighting the dynamics of the community. A vote was organized to decide the place, and finally, GREC2011 was decided to be organized by Pr. Young-Bin Kwon at Chung-Ang University, Seoul, Korea, Sept 15-16, 2011, just before ICDAR2011.

Conference Report: ICDAR 2009

10th International Conference on Document Analysis and Recognition

26-29 July 2009
Barcelona, Catalonia, Spain

General Chair:

Josep Lladós (Spain)

Executive Co-Chairs:

Ernest Valveny (Spain)
Gemma Sánchez (Spain)
Dimosthenis Karatzas (Spain)

Report prepared by the Conference Chairs

ICDAR is the main event of the technical committees TC-10 and TC-11 within the International Association for Pattern Recognition (IAPR).

The volume and quality of technical material submitted to the conference confirm that Document Analysis and Recognition is an active community, both from the scientific and industrial sides, and reinforce ICDAR's status as one of the flagship Pattern Recognition conferences. ICDAR2009 had a varied and high quality technical program, managed by A. Antonacopoulos, M. Cheriet, and U. Pal. We received more than 430 submissions, a record in the history of the conference. Of these, about 20% were accepted as oral and 44% as poster presentations. About 16% of accepted papers had at least one author from a company, which shows that our research has a strong industrial impact, and the field is rich in industry-academia pathways. The most represented topics were handwriting recognition, character recognition, and DIA systems and applications. ICDAR had 378 registered participants coming from 31 countries. Of these, 255 were full registrants, and 123 were students. The proceedings of ICDAR2009 were edited by IEEE and are publicly available at the conference web site.

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In addition to the regular sessions, five prestigious keynotes have been presented by H. Bunke, IAPR Fellow (*Graph-based Representations in Document Analysis*), A. Conteh (*Mass Digitisation in Digital Libraries: The Experience of the British Library*), A. Dengel, IAPR Fellow (*Ontology-Based Document Understanding on the Semantic Desktop*), A. Isaev (*Enterprise Approach to OCR Technology Development Speaker*), and G. Lorette (*Ten editions of ICDAR: Overview and Outlook*).

Besides the main conference, ICDAR2009 included four satellite workshops, namely CBDAR2009 (chairs: T. Breuel and S. Uchida; 51 participants); MOCR2009 (chairs: V. Govindaraju, IAPR Fellow, and P. Natarajan; 27 participants), AND2009 (chair: D. Lopresti; 29 participants) and GREC2009 (chair: J. M. Ogier; 62 participants, *see related article*). The last one took place in La Rochelle (France). Four tutorials were organized the day before the main conference. Interactive Multimodal Transcription of Handwritten Text Images (E. Vidal, A. Tosselli; 13 participants), Forensic Document Examiners Approach To Handwriting Comparisons / Identification (S. Ibrahim, E. van den Heuvel; 9 participants), Digital Libraries and Historical Document Processing (A. Antonacopoulos, S. Marinai; 20 participants), Pattern Recognition Systems – Conception, Evaluation and Improvement (V. Märgner, H. El Abed; 20 participants). The scientific program was also completed with nine competitions. As in ICDAR2007 in Curitiba (Brazil), to offer an increased visibility to the presentation of the competition reports, the session was designed as a plenary session just before the closing session.

We wish to congratulate Prof. Horst Bunke who received the IAPR/ICDAR Outstanding Achievements Award for his outstanding and continued contributions to research and education in handwriting recognition and document analysis, and services to the community. We also wish to congratulate Dr. Katrin Franke who received the IAPR/ICDAR Young Investigator Award for her outstanding contributions to

IAPR/ICDAR Outstanding Achievements Award presented to Horst Bunke

From left: Jordi Marquet (Vice-rector of Strategic Projects of the Universitat Autonoma de Barcelona), Horst Bunke (IAPR/ICDAR Outstanding Achievements Award), Josep Llados (ICDAR2009 General Chair), and Hiromichi Fujisawa (past recipient of the Award).

IAPR/ICDAR Young Investigator Award presented to Katrin Franke

From left: Liu Wenyin (IAPR TC10 Chair), Katrin Franke (IAPR/ICDAR Young Investigator Award), Dan Lopresti (IAPR TC11 Chair), and Josep Llados (ICDAR2009 General Chair)

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handwriting analysis and computational forensics.

Three paper award categories were presented. The Best Paper Award, sponsored by Itesoft, was presented to X. Peng, S. Setlur, V. Govindaraju, R. Sitaram and K. Bhuvanagiri for the paper *Markov Random Field Based Text Identification from Annotated Machine Printed Documents*. The Best Student Paper Award, sponsored by IBM, was presented to P. Pratim Roy, U. Pal, J. Lladós and M. Delalandre for the paper *Multi-Oriented and Multi-Sized Touching Character Segmentation using Dynamic Programming*. The Best Industry Related Paper Award, selected by the IAPR Industrial Liaison Committee was presented to Y. Wang and Q. Huo for the paper *Design Compact Recognizers of Handwritten Chinese Characters Using Precision Constrained Gaussian Models, Minimum Classification Error Training and Parameter Compression*. On behalf the ICDAR2009 organizing committee we would like to congratulate the awardees for their excellent contributions.

Last but not least, ICDAR2009 had an exciting social program. The welcome reception was held in the UAB campus, enjoying traditional Catalan food and folklore performances. The Conference banquet took place in Sala Maremagnum, in Barcelona Old Harbour, with a final performance of *Rumba Catalana*. Before the dinner, participants went on a boat trip around the Port Vell (Old Harbour) enjoying the beautiful views of the coast of Barcelona.

The next edition, ICDAR2011, will take place in Beijing (China) in July 2011. We wish the organizers a lot of success with the organization!

Proceedings of the conference were edited by IEEE and are available by clicking on the Technical Program tab at the conference web site:

www.icdar2009.org

Conference Report: ICIAP 2009

15th International Conference on Image Analysis and Processing

8-11 September 2009
Vietri sul Mare (Salerno), Italy

General Chair:

Mario Vento, IAPR Fellow (Italy)

Program Chairs:

Pasquale Foggia (Italy)
Carlo Sansone (Italy)

Report prepared by the General and Program Chairs

The ICIAP 2009 attendees at the Welcome Cocktail on the Lloyd's Baia Terrace

ICIAP is a conference organized every two years by the GIRPR, the Italian group of researchers affiliated with the IAPR. The aim of these conferences is to bring together researchers working on image analysis, image processing and pattern recognition from around the world.

ICIAP2009 maintained the wide-spectrum connotation of the previous editions. With this edition, we tried to find a unifying thread underlying the works presented. A cross-cutting concern for the various problems (analysis, classification, learning) and for the various application domains that are of interest to our community is the evaluation and comparison of performance. In pattern recognition this is more often than not a hard task because of problems like the lack of standard, widely available databases, or the difficulty in defining a set of common performance indices suitable for all applications. Thus, we emphasized this aspect in the ICIAP2009 program.

The technical program included 107 papers (chosen from 168 submissions), divided into 12 plenary oral sessions (36 papers) and two poster sessions (71 papers). The conference was attended by 152 participants (87 from Italy and 65 from other countries).

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The program also included three invited talks by David Stork, IAPR Fellow (Ricoh Innovations, USA), Bogdan Gabrys (Bournemouth University, UK), and Stan Matwin (University of Ottawa, Canada). For the latter two, the talks were organized in an unusual way, to conform to the ICIAP2009 general theme of "comparison": the two speakers presented a talk on the same topic as seen from their different point of views, with Bogdan Gabrys proposing a Pattern Recognition approach and Stan Matwin a Machine Learning approach. A stimulating comparison between the two approaches was made possible by the coordination and moderation by Floriana Esposito.

From left to right: Stan Matwin (invited speaker), Floriana Esposito (invited session chair), Mario Vento (ICIAP2009 chair) and Bogdan Gabrys (invited speaker)

Within the general framework of comparison and performance evaluation, ICIAP2009 also hosted the first edition of the *Fingerprint Liveness Detection Contest* (LivDet2009), organized by Fabio Roli IAPR Fellow, Stephanie Schuckers and Gian Luca Marcialis. The results of the contest were presented in a special contest session.

Also, in relation to the performance evaluation theme, ICIAP2009 included a demo session, in order to give both researchers and private companies an opportunity to show the actual working of their proposed systems.

The first day of the conference two tutorials were offered, on *3D Video Processing for Immersive 3D Videoconferencing* (by Oliver Scheer) and on *Human-centered Vision Systems* (by Hamid Aghajan and Nicu Sebe).

During the conference, the Caianiello Prize, in memory of Prof. E. Caianiello, was awarded to the best paper by a young author, as in the previous editions. The winner of this edition was Roberto Toldo, with the paper *Automatic estimation of the inlier threshold in robust multiple structures fitting*. Also, a prize sponsored by IAPR was awarded to the best paper presented at the conference. The winners of this prize were Shengping Xia and Edwin Hancock, IAPR Fellow, with the paper *Learning Class Specific Graph Prototypes*.

The social program of the conference included a Welcome Cocktail on the terrace of the Lloyd's Baia Hotel, located atop a steep cliff overlooking the sea. The Gala Dinner was held in the beautiful town of Ravello, a UNESCO World Heritage Site since 1996. The dinner was preceded by a visit to the spectacular gardens of Villa Rufolo, the place where Richard Wagner found ispiration for his *Parsifal*. During the dinner, the GIRPR President, Gabriella Sanniti di Baja, announced that the next ICIAP, in 2011, will be held in Ravenna and will be organized by Prof. Giuseppe Maino.

Finally, but not least important, during the conference a special session was held to commemorate the achievements of our estimated colleague Prof. Vito Di Gesù, who left us last March. Prof. Di Gesù was always an active and important presence in the GIRPR community.

Proceedings of the conference have been published by Springer-Verlag in the series Lecture Notes on Computer Science (Volume 5716) with the title Image Analysis and Processing.

Conference Report: VSMM 2009

15th International Conference on Virtual Systems and Multimedia

9-12 September 2009
Vienna, Austria

Conference Co-Chairs:

Robert Sablatnig (Austria)
Martin Kampel (Austria)

Report prepared by: Robert Sablatnig

Group photo at the Gloriette

VSMM 2009 was organized by the Pattern Recognition and Image Processing (PRIP) Group. The conference was endorsed by the International Association for Pattern Recognition (IAPR). The main aim of this conference was to bring together researchers in the fields of Computer Vision, Multimedia Technologies, Cultural Heritage, Image Processing, Image Analysis and Pattern Recognition and the Digital Documentation/Preservation in Cultural Heritage. The conference was intended as a convention of renowned experts in all areas of pattern recognition and image processing to present and discuss recent progress and advances in the fields of: 3D Reconstruction & Modeling for Cultural Heritage, Human Factors, Virtual Environments, Edutainment, Media Arts, Digital Performance, Cultural Heritage and Museum Environments, Document Analysis, Design, Rendering, Computer Vision, Augmented Reality, Gaming and Education.

VSMM 2009 was a very successful event, which brought together 92 participants from 22 different countries. 34 out of 60 contributions were presented

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in 8 oral sessions. Each submitted paper received three reviews, upon which decisions were based on correctness, presentation, technical depth, scientific significance and originality. In addition to our conference delegates we had two invited speakers: Prof. David G. Stork,IAPR Fellow (Ricoh Innovations and Stanford University) gave a very interesting presentation on "Computer graphics for the study of fine art: Virtual reconstructions of tableaus and studios to illuminate the methods of the masters", and Susan Bryan (Walt Disney Imagineering) presented "Toy Story Mania: Making Disney's First 3D Interactive Dark Ride" giving interesting insights on how Disney attractions are planned and engineered. The VSMM 2009 conference also hosted two workshops on Serious Gaming in Cultural Heritage and 3D Knowledge Technologies for Cultural Heritage Applications.

IAPR Best Student Paper Award

Karol Kwiatek (right, IAPR Best Student Paper Award) and Robert Sablatnig (Chair)

To motivate students to work in the area of Computer Vision Applications for Cultural Heritage this year for the first time an IAPR Best Student Paper Prize was awarded to the author of the best paper written solely or primarily by a student appearing in the workshop proceedings. Karol Kwiatek (supervisor: Martin Woolner) received this IAPR Best Student Paper Award for his work entitled "*Embedding Interactive Storytelling within Still and Video Panoramas for Cultural Heritage Sites*" because of the clarity and quality of the written paper as well as the presentation.

Proceedings of VSMM 2009 have been published with the IEEE Computer Society Conference Publishing Services and will be accessible online at *ieeexplore.ieee.org*.

The success of the conference was possible due to the authors who contributed their work to the symposium, the dedicated work of the members of the program committee, and finally the organizing committee. Following the tradition of all VSMM conferences, the conference will not only impact on the current research of the readers but will also represent important archival material published by IEEE. The VSMM 2009 also featured an outstanding social program including a reception at the Gloriette Vienna, a classical concert at Schönbrunn castle, a conference dinner at the Vienna city hall, and a traditional Vienna "Heurigen" visit.

Non-IAPR Workshop Report: CTIC 2009

2nd Workshop on Computational Topology in Image Context

26-28 August 2009
St. Kathrein/Offenegg, Austria

Co-chairs:

Walter Kropatsch (Austria)
Helena Molina-Abril (Austria)

Report prepared by:

Rocío González Díaz (Spain)

CTIC2009 participants in front of the entrance to the Katerloch cave

The 2nd Workshop on Computational Topology in Image Context (CTIC) was an international event successfully organized by the Pattern Recognition and Image Processing (PRIP) Group in Vienna, Austria. CTIC 2009 was chaired by Walter G. Kropatsch (IAPR Fellow, chair of IAPR Fellow Committee) and Helena Molina-Abril. The location of the conference was a charming hotel in the heart of the Almenland Nature Reserve in Austria.

The aim of CTIC workshop was to gather researchers who deal with the study of topological invariants from a computational point of view, and/or who wish to use topological information in image applications. For this reason, submissions included recent but yet unpublished results, reports on research in progress, and recently published results.

The 20th International Conference on Pattern Recognition

ICPR 2010 Istanbul

23-26 Aug 2010

FIRST CALL FOR PAPERS

ICPR 2010 is the twentieth conference of the International Association for Pattern Recognition (IAPR).

ICPR 2010 will be an international forum for discussions on recent advances in the fields of Computer Vision; Pattern Recognition and Machine Learning; Signal, Speech, Image and Video Processing; Biometrics and Human Computer Interaction; Multimedia Analysis, Processing and Retrieval; Medical Imaging and Visualization.

IMPORTANT DATES

Deadline for paper submission:
January 15, 2010

Deadline for tutorial proposals:
February 15, 2010

Deadline for workshop proposals:
November 15, 2009

Notification of acceptance:
March 30, 2010

Camera ready papers and author registration:
April 30, 2010

End of early bird registration period:
May 15, 2010

www.icpr2010.org

IAPR The International Association for Pattern Recognition

Sabanci Universitesi

PAPER SUBMISSION
Authors will be requested to submit their papers electronically through the conference website by January 15, 2010.

ORGANIZING COMMITTEE

Conference Chair
- Aytul Ercil — Sabanci University, Turkey

Technical Co-Chairs
- Kim Boyer — Rensselaer Polytechnic Institute, USA
- Mujdat Cetin — Sabanci University, Turkey

Advisory Committee
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- Huseyin Abut — San Diego State University, USA
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- Horst Bunke — University of Bern, Switzerland
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- Igor B. Gurevich — Russian Academy of Sciences, Russia
- Anil K. Jain — Michigan State University, USA
- Takeo Kanade — Carnegie Mellon University, USA
- Rangachar Kasturi — University of South Florida, USA
- Josef Kittler — University of Surrey, UK
- Brian Lovell — University of Queensland, Australia
- Pietro Perona — California Institute of Technology, USA
- Alberto Sanfeliu — Politechnical University of Catalonia, Spain
- Bernhard Scholkopf — Max Planck Institutes, Germany
- Mubarak Shah — University of Central Florida, USA
- Tieniu Tan — National Laboratory of Pattern Recognition, China
- Sergios Theodoridis — University of Athens, Greece

Plenary Speakers Committee
- Anil K. Jain — Michigan State University, USA

Tutorials
- Denis Laurendeau — Laval University, USA
- Arun Ross — West Virginia University, USA
- Binsen Yazici — Rensselaer Polytechnic Institute, USA

Workshops
- Selim Aksoy — Bilkent University, Turkey
- Theo Gevers — University of Amsterdam, Netherlands
- Denis Laurendeau — Laval University, USA
- Bulent Sankur — Bogazici University, Turkey

Publications
- Cem Unsalan — Yeditepe University, Turkey

Local Arrangements
- Aysin Baytan Erfuzun — Bogazici University, Turkey
- Mustafa Unel — Sabanci University, Turkey

Finance
- Gulbin Akgun — Sabanci University, Turkey
- Hakan Erdogan — Sabanci University, Turkey

Publicity
- Enis Cetin — Bilkent University, Turkey
- Pinar Duygulu Sahin — Bilkent University, Turkey

Sponsorship
- Fatos Yarman Vural — Middle East Technical University, Turkey

Exhibits
- Oktay Kursun — Bahcesehir University Turkey

TRACKS
We anticipate that the conference will feature six parallel theme tracks. Each theme track will address an area of interest to the pattern recognition community.

TRACK CO-CHAIRS

Track I: Computer Vision
- Joachim Buhmann — ETH Zurich, Switzerland
- Xiaoyi Jiang — University of Munster, Germany
- Jussi Parkkinen — University of Joensuu, Finland
- Alper Yilmaz — Ohio State University, USA

Track II: Pattern Recognition and Machine Learning
- G. Sanniti di Baja — Istituto di Cibernetica Eduardo Caianiello, Italy
- Mario Figueiredo — Instituto Superior Tecnico, Portugal
- Bilge Gunsel — Istanbul Technical University, Turkey
- D.Y. Yeung — Hong Kong University of Science and Technology, China

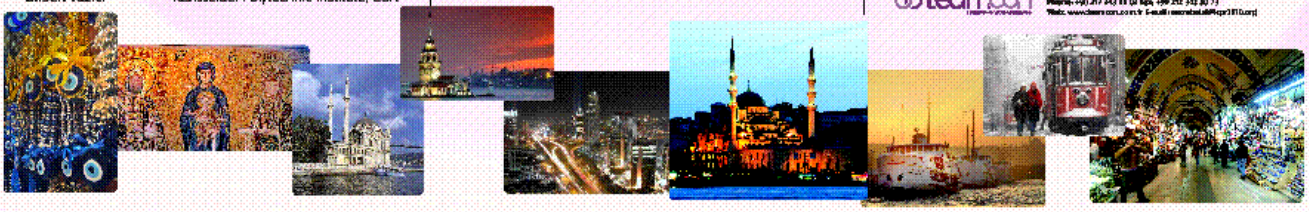
Track III: Signal, Speech, Image and Video Processing
- John H.L. Hansen — University of Texas, USA
- Maria Petrou — Imperial College, UK
- Kazuya Takeda — Nagoya University, Japan
- Murat Tekalp — Koc University, Turkey

Track IV: Biometrics and Human Computer Interaction
- Lale Akarun — Bogazici University, Turkey
- Patrick Flynn — University of Notre Dame, USA
- B. Vijaya Kumar — Carnegie Mellon, USA
- Stan Z. Li — Chinese Academy of Sciences, China

Track V: Multimedia Analysis, Processing and Retrieval
- Nozha Boujemaa — French National Institute for Research in Computer Science and Control, France
- Bemin Yanikoglu — Sabanci University, Turkey
- B. S. Manjunath — University of California, Santa Barbara, USA
- Nicu Sebe — University of Amsterdam, Netherlands

Track VI: Medical Imaging and Visualization
- Rachid Deriche — French National Institute for Research in Computer Science and Control, France
- Tianzi Jiang — Chinese Academy of Sciences, China
- Dimitris Metaxas — The State University of New Jersey, USA
- Gozde Unal — Sabanci University, Turkey

Congress Secretariat:
teamcon



Call for Nominations: King-Sun fu Prize

Nominations deadline: 10 January 2010

Nomination and endorsement forms can be downloaded from the KS Fu Prize page of the IAPR web site.

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

Professor Josef Kittler
2006 Hong Kong

Professor Anil K. Jain
2008 Tampa

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's biography appeared in the IEEE Trans. PAMI, May 1986 and is also available at *dataclustering.cse.msu.edu/KSFu_Biography.pdf*).

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 nominator.

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 2010 prize will be presented at the

20th International Conference on Pattern Recognition (ICPR)
Istanbul, Turkey
August 23-26, 2010

The nomination must be made on special nomination and endorsement forms (in the MS Word format), and must be received by the Award Committee Chairman no later than 10 January, 2010. 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. Anil K. Jain
Chair, K-S. Fu Prize Committee
Department of Computer Science & Engineering
Michigan State University
3115 Engineering Building
East Lansing, Michigan 48824
email: jain@cse.msu.edu

Call for Nominations: J.K. Aggarwal Prize

Nominations deadline: 10 February 2010

Nomination and endorsement forms can be downloaded from the J.K. Aggarwal Prize page of the IAPR web site.

The International Association for Pattern Recognition (IAPR) is pleased to announce a call for nominations for the third J.K. Aggarwal Prize in honor of Professor J.K. Aggarwal.

Professor Aggarwal is widely recognized for his extensive contributions to the field of pattern recognition and for his participation in IAPR's activities.

Past recipients of the J.K. Aggarwal Prize

Professor Bernhard Schölkopf
2006 Hong Kong

Professor Song-Chun Zhu
2008 Tampa

The recipient is a young scientist, under the age of 40 at the date of the deadline for nominations, who has brought a substantial contribution to a field that is relevant to the IAPR community and whose research work has had a major impact on the field. The prize 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 J. K. Aggarwal 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 four members, representing at least two member societies different from that of the nominators and nominee.

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

The 2010 prize will be presented at the

20th International Conference on Pattern Recognition (ICPR)
Istanbul, Turkey
August 23-26, 2010

The prize recipient is expected to present an invited talk at the conference.

The nomination must be made on special nomination and the endorsement forms, and must be received no later than 10 February 2010. Both completed nomination and endorsement forms must be submitted in electronic form. The nominator as well as endorsers should email their completed forms directly to the Appointed Chairman of the J.K. Aggarwal Prize Committee via the specified email address:

Bernhard Schölkopf
Chair, J.K. Aggarwal Prize Committee
Max-Planck-Institut für biologische Kybernetik
Spemannstr. 38
D-72076 Tübingen
Germany
email: sekretariat-schoelkopf@tuebingen.mpg.de

Please see Professor Aggarwal's article in this issue of the *IAPR Newsletter*.

"Recognition of Human Activity: A Grand Challenge"

Call for Nominations: IAPR Fellows

Nominations deadline: 28 November 2009

Nomination and endorsement forms can be downloaded from the IAPR Fellow Nominations page of the IAPR web site.

Anyone is eligible to be nominated, except for the current members of the Executive Committee and of the Fellow Committee.

To initiate a nomination, a nominator must submit an IAPR Fellow Nomination Form. Any member of an IAPR Member Society can serve as nominator, except the nominee him/herself and current members of the Fellow Committee.

Each nomination must be endorsed by at least one recommendation letter (submitted Endorsement Form), either from a member of an IAPR Member Society (different from the nominator) or from an IAPR Fellow.

Electronic Nomination and Endorsement forms should be submitted no later than November 28, 2009.

Each electronic submission will be acknowledged by an email containing the submitted form. In case of troubles, please address your data and the problem encountered through email to the chair of the Fellow Committee, Walter G. Kropatsch, IAPR Fellow.

To: krw@prip.tuwien.ac.at
Subject: IAPR fellowship 2009
CC: iaprwebmaster©cedar.buffalo.edu

For detailed information about the nomination and the endorsement please download these instructions.

IAPR appreciates your efforts to support our fellowship program!

Free Books!

The *IAPR Newsletter* is looking for reviewers for the books 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*.

Arjan Kuijper, IAPR Newsletter *Associate Editor for Book Reviews*

The following titles are available to be reviewed:

Statistical Learning and Pattern Analysis for Image and Video Processing
Series: Advances in Pattern Recognition
Zheng, Nanning, Xue, Jianru
2009, Approx. 370 p. 102 illus., 74 in color., Hardcover
ISBN: 978-1-84882-311-2
http://www.springer.com/computer/computer+imaging/book/978-1-84882-311-2

Algebraic Geometry and Statistical Learning Theory
Series: Cambridge Monographs on Applied and Computational Mathematics
Watanabe, Sumio
2009, Approx. 276 pages
ISBN: 978--0-521-86467-1
Publisher's web page: *http://www.cambridge.org/catalogue/catalogue.asp?isbn=9780521864671*
Author's web page: *http://watanabe-www.pi.titech.ac.jp/~swatanab/ag-slt.html*

The following titles are also due to be published very soon:

Fundamentals of Computerized Tomography Image Reconstruction from Projections
Series: Advances in Pattern Recognition
Herman, Gabor T.
Originally published by Academic Press, 1980
2nd ed., 2009, XII, 300 p. 98 illus., Hardcover
ISBN: 978-1-85233-617-2
http://www.springer.com/computer/computer+imaging/book/978-1-85233-617-2

Guide to OCR for Indic Scripts
Document Recognition and Retrieval
Series: Advances in Pattern Recognition
Govindaraju, Venu; Setlur, Srirangaraj (Eds.)
2009, XXI, 325 p. 161 illus., 11 in color., Hardcover
ISBN: 978-1-84800-329-3
http://www.springer.com/new+%26+forthcoming+titles+%28default%29/book/978-1-84800-329-3

Also, of interest...

Robert Listou
725 Third Street SW, Washington, DC 20024
Phone: 202.554.8281 Fax 202.484.4883
rlistou@execware.com

OPEN LETTER TO:

■ Cognitive scientists (psychologists, neuroscientists, computer scientists, philosophers, etc.).

■ Persons receptive to new types of software applications (CIOs seeking mission support software; people who use -or could use - data tables for analyzing....well, anything; technical writers, technical magazines, software reviewers, etc).

■ Entrepreneurs (software publishers, application developers, venture capitalists, angels, etc.).

This is an invitation to the first 2 groups above to review, then critique, an innovative mind-centered analytic methodology for data discovery in data tables, also evidence marshaling. Automated permutation, and much more, help the user perceive both desired and unexpected information in the varied arrangements of parameter values on the table; and the shifting order of items on the table supports development of alternate hypotheses regarding sequences. The software is a cognitive tool used to shape and reshape, in real time, the imaged data to reflect the users reasoning. A cognitive scientist wrote this about the process, "...the genius of your methodology."

For more information: emerginganalytic.us.

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			
CIARP 2009	*14th Iberoamerican Conference on Pattern Recogntion*	Guadalajara, México	15-18 Nov 09
DICTA 2009	*Digital Image Computing: Techniques and Applications 2009*	Melbourne, Australia	1-3 Dec 09
2010			
MCS 2010	*9th International Workshop on Multiple Classifier Systems*	Cairo, Egypt	7-9 Apr 10
ANNPR 2010	*4th International Workshop on Artificial Neural Networks in Pattern Recognition*	Cairo, Egypt	11-13 Apr 10
DAS 2010	*Ninth IAPR International Workshop on Document Analysis Systems*	Cambridge, MA, USA	9-11 Jun 10
CIP 2010	*2nd International Workshop on Cognitive Information Processing*	Elba Island (Tuscany), Italy	14-16 Jun 10
ICISP 2010	*International Conference on Image and Signal Processing 2010*	Trois-Rivieres, Quebec, Canada	30 Jun-2 Jul 10
S+SSPR 2010	*Joint IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR2010) and Statistical Techniques in Pattern Recognition (SPR2010)*	Cesme, Izmir, Turkey	18-20 Aug 10
ICPR 2010	*20th International Conference on Pattern Recognition*	Istanbul, Turkey	23-26 Aug 10
IWCF 2010	4th International Workshop on Computational Forensics	Tokyo, Japan	11-12 Nov 10
ICFHR 2010	*12th International Conference on Frontiers in Handwriting Recognition*	Kolkata, India	16-18 Nov 10
2011			
ICDAR 2011	*11th International Conference on Document Analysis and Recognition*	Beijing, China	18-21 Sep 11