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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 20th International Conference on Pattern Recognition (ICPR 2010).

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Calls for Papers

CCIW 2011 *2011 Computational Color Imaging Workshop* Milano, Italy Deadline: December 1, 2010 April 20-21, 2011	ICIAP 2011 *16th International Conference on Image Analysis and Processing* Ravenna, Italy Deadline: February 15, 2011 September 14-16, 2011
SCIA 2011 *17th Scandinavian Conference on Image Analysis* Ystad Saltsjöbad, Sweden Deadline: December 15, 2010 May 23-27, 2011	ICDAR 2011 *11th International Conference on Document Analysis and Recognition* Beijing, China Deadline: March 1, 2011 September 18-21, 2011
MVA 2011 *12th IAPR Conference on Machine Vision Applications* Nara City, Japan Deadline: December 15, 2010 June 13-15, 2011	CIARP 2011 *16th Iberoamerican Congress on Pattern Recognition* Pucón, Chile Deadline: April 18, 2011 November 15-18, 2011
MCS 2011 *10th International Workshop on Multiple Classifier Systems* Naples, Italy Deadline: January 15, 2011 June 15-17, 2011	GREC 2011 *9th IAPR International Workshop on Graphics RECognition* Seoul, Korea Deadline: May 15, 2011 September 15-16, 2011
GbR 2011 *TC-15 Workshop on Graph-based Representations in Pattern Recognition* Münster, Germany Deadline: January 10, 2011 May 18–20, 2011	IJCB 2011 *IEEE/IAPR International Joint Conference on Biometrics* Washington, DC, USA Deadline: May 27, 2011 September 26-28, 2011

Call for Submissions

IAPR Newsletter

Articles, announcements, book reviews, conference and workshop reports

Contact the editor:
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Feature Article

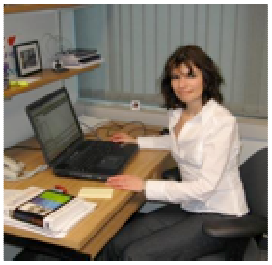
Thank you to all who contributed reviews of the Invited Talks presented at ICPR 2010. Without you this Feature would not have been possible.

~A. Branzan Albu, ed.

Proceedings are available through IEEE*Xplore*

The Feature Article in this issue of the *IAPR Newsletter* presents ICPR 2010 statistics, impressions, reviews of the invited talks, and lists of IAPR award winners.

Feature
ICPR 2010 Statistics



ICPR 2010: Facts and Figures

By **Alexandra Branzan Albu (Canada)**

This note is a short follow-up on my article “Looking back on 20 years of ICPR conferences” ([html] [pdf]) that was published in the July 2010 issue of the Newsletter.

First, I would like to acknowledge the excellent organization of ICPR 2010, for which we thank the hardworking and omnipresent conference chair, Prof. Aytul Erçil, and the local arrangements committee.

ICPR 2010 brought together 1250 participants from 53 countries. It received a record number of 2140 submissions, from which 1147 papers were accepted as 385 oral presentations and 762 posters. The overall acceptance rate was 53.5%, the most selective one since ICPR 2004.

But this is only a dry summary of a conference that was truly inspiring via its technical and social programs, as well as its venue. For more insight into the atmosphere of ICPR 2010, I invite you to read Arjan Kuijper’s article, “Amazing Istanbul”.

Feature
Istanbul Impressions

Amazing Istanbul!

By Arjan Kuijper (Germany)

The organizers of ICPR 2010 made a small mistake by choosing Istanbul as their location. Read on and you'll see why!

View up the Bosporus from Topkapi Palace. (Photo by Linda O'Gorman)

Istanbul…. Before the start of ICPR my knowledge of this city was based on its history: it is located strategically at the Bosporus, the small strip of water separating Asia and Europe. Therefore, it became one of the most important cities in ancient Greek history under the name Byzantium, in Roman history as Constantinople, and in Osmanic times as Istanbul. This unique situation has left its traces everywhere in the city, but before I get completely off-topic I'd better refer you to Wikipedia (*en.wikipedia.org/wiki/Istanbul*) if you want to know more.

Enough of my basic knowledge! What I didn't know is that Istanbul is among the 5 largest cities in the world with its 12.8 million inhabitants. For someone who was raised in the Netherlands (16.6 million inhabitants) and had long-term stays in Denmark (5.5 million) and Austria (8.4 million), this is a number that is hard to grasp – well, I guess that holds for most people. This population size obviously has its impact on the infrastructure. So, when I read about the possibility to arrange an airport-hotel transfer, I thought that it would be faster, easier and definitely cheaper to get taxi. I was wrong – about the price. With such a large city it indeed takes quite some time to get somewhere. To my pleasant surprise the cab driver warned me that it would be an "expensive" trip. This was something I was not used to and found to be typical of the friendly Turkish manners that I experienced at the conference center and the hotel.

Among the well-known big-city-problems are traffic jams. Also, Istanbul clearly faces the problem that the density of cars is too high. One way to solve this as a cab driver is to use every tiny opportunity to change lanes if there is just a tiny little hole that would bring you half a meter further. All drivers seemed to be rather experienced in this, as I didn't see a single accident – to my big surprise. Among these drivers were also the bus drivers that brought us to the social events: the welcome reception and the conference dinner. At these trips they showed us their amazing skills, which gave some entertainment, making it worth using the bus instead of walking all the way. From a time perspective, it would not have made a large difference, though! Both events took place at marvelous locations and gave plenty of time for informal talks (read: networking). Compliments to the organization!

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So, was anything scientific going on as well, you may wonder. Definitely! The four main conference days were filled with great plenary talks and parallel sessions. Here I start to struggle with the ICPR-structure. Often, there is more than one interesting session, and almost every time, I find the too many posters interesting, implying that I have to skip parts of oral sessions in order to be able to see all of the posters. So, I encountered the interesting phenomenon that oral presentations are usually considered more prestigious and more difficult to get when submitting a paper, while at the same time with a poster one may distribute the research to (many) more people, and often to those who have interest in the work that has been done. And, of course the worst thing is that your own poster is scheduled in a poster session with many interesting other posters!

Of the plenary sessions, the one that impressed me most was the one by Shree Nayar (see related article in this issue). Of course, all of the talks were interesting and good, but Nayar's "excursion" at the end was cool. He talked about his project "BigShotCamera" (-.org!) with schoolchildren around the age of 10, who get a fancy camera that they first have to build together. The camera has three different lenses (normal, panoramic, and stereo) and an appealing look. The kids can relatively easily take pictures and put them on-line. This project may be a very good way to get children interested in the world of imaging in the broadest sense, and thereby pave the road for our successors. It would be nice to see some of them at ICPR 2022 or so!

Time to get back to my first sentence – what was actually the mistake the organizers made? Well, they included in the bag with gadgets a booklet about Istanbul. And of course, in such a city with such a history there are many highlights one must see. So, unfortunately, I had to skip a part of the program to do some sightseeing; I apologize to those whose talks / posters I missed! And yes, the Hagia Sophia (incorporating the secular and religious history of Istanbul) is worth a visit, even better: if you were at ICPR and didn't visit it (her?) you missed something. What remains to you is Wikipedia: en.wikipedia.org/wiki/Hagia_Sophia.

Hagia Sophia (Photos by Emily O'Gorman)

I'm already looking forward to Tsukuba, Japan were ICPR 2012 will take place (yes – they have highlights too!) and even more to Sendai, the location for S+SSPR 2012, the workshop of TC1 and TC2 traditionally accompanying ICPR. It will be my pleasure to personally welcome you in Sendai!

Feature
K.S. Fu Prize Lecture

Towards the Unification of Structural and Statistical Pattern Recognition

By Horst Bunke (Switzerland)
Reviewed by Cem Keskin (Turkey)

The session started with Prof. Anil Jain, IAPR Fellow, introducing Prof. Horst Bunke, IAPR Fellow. Prof. Bunke started his talk by mentioning the revolutionary work of K.S. Fu. He then mentioned the two common approaches to pattern recognition, namely statistical and structural approaches. The former approach mainly makes use of feature vectors, whereas the latter uses strings, trees, and—most importantly—graphs as representatives. The talk continued with a comparison of these approaches.

The advantages of statistical approaches, as Prof. Bunke pointed out, are that they have strong theoretical foundations, and that there are many powerful associated algorithms. Yet, these methods usually use feature vectors of fixed dimensionality (based on the application), and make use of only unary features and not relations.

On the other hand, structural approaches have a variable representation size, which is based on the size of the graph, and generally have a higher representational power, Prof. Bunke added. However, unlike the statistical approaches, these methods suffer from a lack of a strong mathematical foundation, and from a lack of algorithmic tools. Prof. Bunke concluded from this argument, that by unifying both approaches, we can come up with stronger methods.

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 Horst Bunke, IAPR Fellow,
Research Group on Computer Vision
and Artificial Intelligence IAM, University of
Bern, Switzerland

Prof. Bunke then explained what has been done in the so called classical period. He first mentioned the graph edit distance, which is the minimum amount of distortion needed to transform one graph into another. An edit path is defined as the sequence of such distortions as applied to the graph. A cost function associated with each type of distortion is used to estimate a cost for such a path, and the minimal such cost is called the graph edit distance. Finally, Prof. Bunke mentioned that faster algorithms have been discovered for this cost estimation problem.

Prof. Bunke continued his talk with the median

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graph finding problem, which can potentially represent a set of graphs with a single graph. Basically, by coming up with a distance measure between graphs, it is possible to find a graph either in the graph set or in the universal set that has minimal distance from all the graphs in the set. He gave some examples of handwritten letters where the estimated universal median was a very intuitive representation of the letters. He also showed that the median for graphs has similar properties to its statistical counterpart, i.e. the median graph is also very robust against noise and outliers. He finally mentioned that by making use of such median graphs (possibly by assigning weights to each affecting graph), it is possible to apply some well-known algorithms from the statistical domain, namely k-means clustering and self organizing maps. He concluded his discussion of the classical period with some examples and results on using SOM and k-NN for graphs.

The difference of the modern period, according to Prof. Bunke, is that the unification of statistical and structural methods is pursued in a more systematic manner by using tools such as graph kernels and graph embedding. Prof. Bunke then showed how the well known kernel trick can be applied to graphs by mapping them to points in R^n, i.e. via graph embedding. He mentioned that their favorite method for graph embedding is choosing a subset of graphs at hand and calculating the graph edit distance of all the graphs with the selected subset, forming a distance vector, describing the position of the graph in the so called dissimilarity space.

To demonstrate the efficiency of these methods, Prof. Bunke showed a few classification results of experiments conducted on several distinct data set types. For most of these data sets, which include handwritten letters, digits, fingerprints, web data, protein data, and molecular structures, the graph embedding method shows significant improvement over k-NN and SVM based on basic similarities.

After mentioning some additional work and literature surveys on graphs, Prof. Bunke went over some current activities in this area. He especially emphasized that the power of graphical representations is not fully explored for some sequential problems, such as handwriting recognition, where traditionally HMMs are used.

Prof. Bunke concluded his talk with a short summary and answered some questions regarding the time complexity of graph matching and the problem dependency of similarity measures for graphs. He said that currently, graphs with 1000 nodes can be matched in seconds using approximate methods, and that the similarity measure is always problem dependent.

Prof. Horst Bunke presenting the K.S. Fu Prize Lecture at ICPR 2010.

Feature

J.K. Aggarwal Lecture

Scene and Object Recognition in Context

By Antonio Torralba (USA)
Reviewed by Oya Çeliktutan (Turkey)

In this talk, Prof. Torralba focused on visual context and its role on object recognition. He started his talk by giving an example of the most common object detection problem: face detection. The most successful approach today is to train a classifier with samples of faces and background. To detect faces in a given image, one extracts all possible overlapping patches at all spatial locations and scales, then for each patch one applies the classifier to decide whether the patch contains a face or not. This idea can be extended to multiclass object detection problems by training a separate binary classifier for different objects and for each viewpoint. This leads to the "Head in the coffee beans problem" in which we ask the detector to find the face among a collection of coffee beans in real time. As shown in Figure 1, there are many distracters and only one positive sample of our target. The detection problem is far from this example. Normally, scenes are more distracting; there are also many different classes of objects we want to detect; and the context relationship among them makes the detection process as hard as possible. However, the other objects in a scene can be used as an information source to help in the recognition and detection of objects.

Figure 1. Head in the coffee beans problem: can you find the head in this image?

In the real world, objects occur with other objects in a particular environment, e.g., a computer screen with keyboard, table, and chair in an office environment. The visual system exploits these contextual associations to localize and recognize objects efficiently. For example, Figure 2 verifies how amazing our visual system is. Despite the low resolution, one can guess what the objects in the image and the action of the person are.

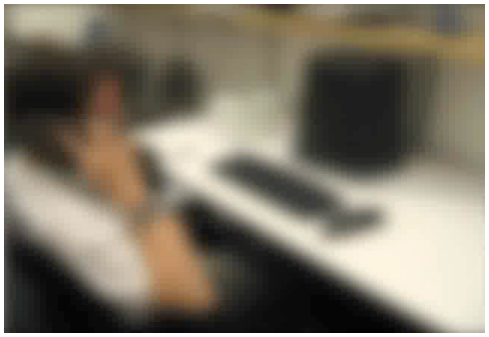

Figure 2. Let's verify how amazing the visual system is

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

The J.K. Aggarwal Prize is a biennial award given to a young scientist 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.

This year's recipient was Professor Antonio Torralba Computer Science and Artificial Intelligence Laboratory, Department of Electrical Engineering and Computer Science, MIT, USA

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For correct detection and recognition of objects, we need to train the classifiers with huge number of samples for each category. The most challenging issue is the lack of data. Prof. Torralba then continued his talk with the data collecting problem and introduced LabelMe, a database and a web-based tool for image annotation [1]. The web-based tool provides users with the ability to browse databases, query images and draw polygons. Thus, a large database of annotated images is built consisting of 530,000 polygons, 8,500 different object descriptions, and 265 object descriptions exhibiting more than 100 instances. Some example object categories that frequently occur in the database are shown in Figure 3. So now the question is, how do we use all this data for object recognition and scene understanding? One is the classical way: take a picture, train a bunch of detectors to recognize different objects that compose the image, and then infer the scene. There is also another way that one can analyze the image by a set of representations such as summary statistics, configuration of textures. There is therefore a lot of work to investigate how the human visual system understands the scene, based on objects or something more abstract. As a case in point, Prof. Torralba invoked a memory test, remarking that one aspect of visual recognition is that humans are able to recognize the meaning or gist of an image within 1/20 of a second and remember its global layout, though some objects and details can be forgotten.

Psychologists have been studying these kinds of representations for computer vision to extract the general idea, geometry and main objects of an image, especially in the framework of fast scene representations. Prof. Torralba introduced dominant global texture descriptors, bag of words, non-localized textons, and spatially organized textures [2] which fit into this category.

Prof. Torralba continued his talk by defining scene categorization task –given a picture, identify the place that it depicts. The largest available dataset of scene understanding contains only 15 classes. For this reason, the Scene Understanding (SUN) Dataset project is conducted to establish a database including all possible scene categories from Abbey to Zoo, resulting in 899 categories and 130,519 images [3]. Xiao et al. [3] performed scene categorizations using various computational features, which have no explicit object awareness. For each image, these features encode statistics of color, self similarity, geometric layout, and texture, and are used to train a classifier, such as SVM, in a one-against-all scheme. They measured human scene classification performance on the SUN database and compared the results with the features. In categorization results, generally, features that perform better are more likely to induce the same mistakes that humans make.

The focus of the talk was to the integration of

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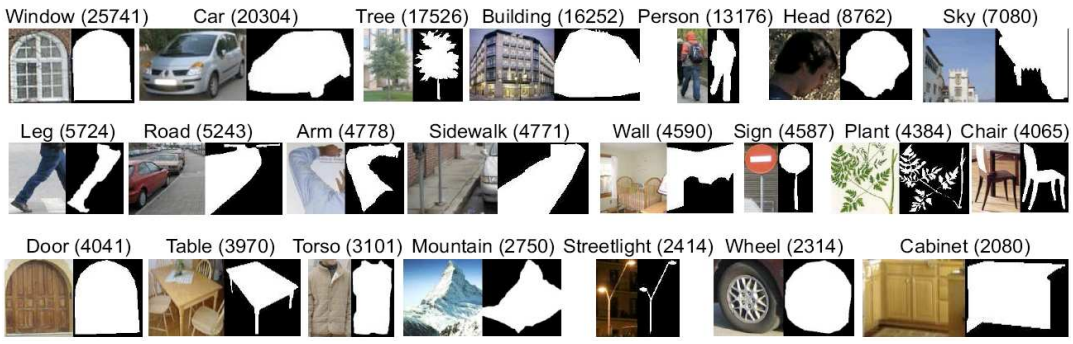

Figure 3. Sample annotated images of LabelMe database

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scene recognition with object recognition. Reasoning about the scene leads one to consider a subset of object categories and build more efficient object recognition systems. By combining a detector with a global context model, we also exploit the correlations between different object classes, i.e., location with respect to each other and the aspect of the objects in a scene. For example, the point of view of cars is correlated with the orientation of the street. But also, the location of the ground in the scene is correlated with the location of the objects in the scene. These scene cues can be used to determine the location of objects of interest as illustrated in Figure 4.

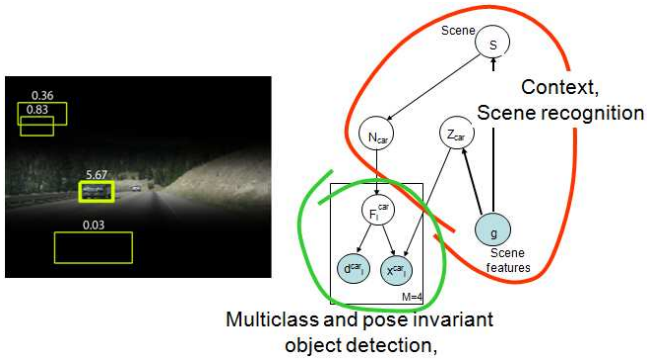

Figure 4. Integrated model of scenes, objects and parts

The integrated model is followed by the question: is context really needed? If we have a small number of classes, objects are clearly defined by their local appearance. But, when we have many object classes, it gets more complicated to detect objects efficiently. Moreover, context is important to figure out not only what the object is but also to define what an unexpected event is. An example is shown in Figure 5. On the left, the context changes the interpretation of the object—the car is only a toy that we cannot drive. On the right, a car in the swimming pool is an unexpected event.

Figure 5. Why context is important?

Prof. Torralba concluded his talk by presenting interesting results from the SUN database. He concluded that learning the object dependencies and using the tree-structured context models [4] can significantly improve the object recognition performance and also enable detection of images out of context.

[1] B. Russell, A. Torralba, K. Murphy, W. T. Freeman, LabelMe: a database and web-based tool for image annotation, International Journal of Computer Vision, pages 157-173, Volume 77, Numbers 1-3, May, 2008.

[2] R. Datta, D. Joshi, J. Li, and J. Z. Wang, Image Retrieval: Ideas, Influences, and Trends of the New Age, ACM Computing Surveys, vol. 40, no. 2, pp. 5:1-60, 2008.

[3] J. Xiao, J. Hays, K. Ehinger, A. Oliva, and A. Torralba, SUN Database: Large Scale Scene Recognition from Abbey to Zoo, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Francisco, CA, June 2010.

[4] M. J. Choi, J. Lim, A. Torralba, and A. S. Willsky, Exploiting Hierarchical Context on a Large Database of Object Categories, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), San Francisco, CA, June 2010.

Feature
ICPR 2010 Plenary Talk

Embracing Uncertainty: The New Machine Intelligence

By Christopher M. Bishop (UK)
Reviewed by Cem Keskin (Turkey)

Professor Chris Bishop is Chief Research Scientist at Microsoft Research Cambridge. He also has a Chair in computer science at the University of Edinburgh, and is a Fellow of Darwin College Cambridge.
Chris is the author of the leading textbook "Pattern Recognition and Machine Learning" (Springer, 2006).
His research interests include probabilistic approaches to machine learning as well as their application to fields such as biomedical sciences and healthcare.

Prof. Bishop started his talk by giving an overview of the major changes in approaches to machine intelligence in the last few decades. Specifically, he mentioned the shift towards cloud computing on very large and distributed databases from data-driven standalone applications. He said that *services* are now replacing the applications, and diverse data sources are being fused instead of isolated databases. Most importantly, hand crafted solutions to machine intelligence problems are being replaced by solutions learned from data sets. To illustrate the increasing importance of data, he showed a figure visualizing the growth of stored data over the years. According to the figure, there were 280 exabytes of stored data in 2008, and it is being doubled every 18 months.

Before going over what he calls the *new age* of machine intelligence, Prof. Bishop talked briefly about the history, starting with the first generation machine intelligence, which started in 60's and ended in 80's. The main approach to problems in this era relied on the expertise of humans and their ability to define rules describing the system. Even though the researchers were optimistic about the progress of machine intelligence at that time, the combinatorial explosion of required rules attributed to more complex systems proved too hard to deal with.

According to Prof. Bishop, the second generation of machine intelligence, which started in the 90's and hasn't been abandoned yet, made use of statistical tools, such as neural networks and support vector machines. The general idea has been to collect positive samples and to train a system using these tools. This system could also be somewhat adapted to the end user through a final phase of fine tuning. The main disadvantage of these methods, he said, is the difficulty of incorporating complex domain knowledge. He showed some basic examples as to why prior knowledge is important and then called these methods *black-box statistical models.*

The aim of the third generation is to integrate domain knowledge with statistical learning methods. Prof. Bishop said that there are three key ideas. The first idea is to use probability distributions to model uncertainties, i.e., Bayesian learning, which iteratively

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updates the uncertainties upon introduction of new knowledge to the system. The second idea is to use probabilistic graphical models, which are especially well-suited to representing domain knowledge. Most well known models and methods, such as Kalman filters, hidden Markov models, principle component analysis, factor analysis, etc., fall into this category. The final key idea is to use efficient inference methods. At this point he showed some basic examples of how a reformulation of terms can lead to huge speed gains, possibly changing the time complexity from exponential to polynomial.

Bayesian methods usually give an answer by integrating over the uncertainty, which is not always possible, as integrating the true distributions associated with problems can be intractable. A common solution, Prof. Bishop said, is to use Monte Carlo methods, but these are very costly. Therefore, usually approximate methods are employed, such as variational message passing, loopy belief propagation, expectation propagation, etc., which are not accurate, but have good accuracy. He then demonstrated these approximate methods for a toy problem.

Prof. Bishop gave Bayesian ranking as a real world problem example, which is the problem of estimating a global ranking from noisy partial rankings. He showed that, by employing an approximate method, they managed to adapt the system to 20 million active users in multiple teams. This system, called TrueSkill, converges to the correct result an order of magnitude faster than its exact counterpart.

Another case study Prof. Bishop showed involved search engines and the number of clicks an ad would receive. Basically, the system tries to estimate the number of clicks an ad would receive if it were shown on a page for specific keywords. This problem has an interesting property: you have to first show the ad in order to collect the data, which is called the exploration vs. exploitation trade-off. Prof. Bishop showed that their system achieved remarkable results.

Finally, Prof. Bishop mentioned Infer.NET, a framework they developed for running Bayesian inference in graphical models. The framework can be used to solve many different kinds of machine learning problems. He then summarized his talk and finished by answering some questions from the audience.

Feature
ICPR 2010 Plenary Talk

Computational Cameras: Redefining the Image

By Shree K. Nayar (USA)
Reviewed by Yasemin Yardimci Cetin (Turkey)

Prof. Nayar began his talk by by pointing out that although the traditional pinhole camera model performs a simple and restrictive sampling of the light in a scene, it has remained the dominant camera model over the past 150 years.

However, this is changing. With new optics, images can be both geometrically and radiometrically modified while they are captured. These modified, or optically encoded, images can be computationally decoded to produce new types of visual information. This is different from the traditional post-processing of images obtained with regular cameras.

Dr. Nayar presented the well-known example of cameras that provide wide fields of view, with emphasis on lens-mirror (catadioptric) systems. He demonstrated the power of such cameras by showing several applications. In addition to standard videoconferencing scenarios, there were surprising applications, such as generating 3D structure from a single image and the spectacular extraction of the ambient environment of a person from a single image of the eye of this person.

The talk continued with how optical masks can be used to increase the dynamic range with minimal compromise of resolution. Next came the concepts of direct and global illumination and how each component conveys independent information about the scene.

In addition to the research on computational cameras, Prof. Nayar also introduced the educational "Bigshot camera" project that was developed for kids to learn the principles of imaging while having fun.

Shree K. Nayar is the T. C. Chang Professor of Computer Science at Columbia University. He co-directs the Columbia Vision and Graphics Center. He also heads the Columbia Computer Vision Laboratory (CAVE), which is dedicated to the development of advanced computer vision systems. His research is focused on three areas: the creation of novel cameras, the design of physics based models for vision, and the development of algorithms for scene understanding. His work is motivated by applications in the fields of digital imaging, computer graphics, and robotics.

Prof. Nayar ended his talk with the prediction that in 50 years from now, the cameras will be tiny but will use flexible optics and a powerful computer to produce a wide variety of images.

More information about Dr. Nayar's research on computational cameras can be found at *www.cs.columbia.edu/CAVE/projects/cc.php*. Details on the educational "Bigshot camera" project can be found at *www.bigshotcamera.org/*.

Prof. Nayar and the Bigshot camera.

Feature

ICPR 2010 Plenary Talk

The Quantitative Analysis of User Behavior Online—Data, Models and Algorithms

By Prabhakar Raghavan (USA)
Reviewed by Hülya Yalçin (USA)

Dr. Raghavan began his talk by stating his interest in the users' online behaviour, and in finding where they look at on the screen. He is interested in watching the gaze of people, but doing that at the scale of millions of people. No wonder so much research goes into understanding the role human gaze plays in search and query processes, if the company is one of the pioneers in search engine business, Yahoo!.

The agenda of Dr. Raghavan's talk was behavioral and computational studies on two dimensional search results and measuring online user engagement.

First, Dr. Raghavan briefly explained how classical one dimensional search takes place. Each document matching a query is assigned a score. Designers of the search engine pick hundreds of features, such as the number of links into a page or the number of occurrences of query terms in the page. Then, the editors of the search engine create search training data with a long series of tuples, each tuple consisting of query, document, and relevance judgment. Relevance judgment indicates how relevant a document is to a query. For example, if the Yahoo! home page appears first when searching "yahoo", then relevance judgment is a perfect match. If the HP home page appears first when searching "ibm", then relevance judgment is a poor match.

With classical one dimensional search, the objects are listed in decreasing order with highest score object being listed first. The eye gaze of the user is trivial to estimate, since the user scans the results page by page, from top to the bottom of the page.

Prabhakar Raghavan is the head of Yahoo! Labs. Raghavan's research interests include text and web mining, and algorithm design.
He is a consulting professor of Computer Science at Stanford University and formerly editor-in-chief of the Journal of the ACM.
He has co-authored two textbooks, on randomized algorithms and on information retrieval.
Prior to joining Yahoo!, he was the chief technology officer at Verity and has held a number of technical and managerial positions at IBM Research.

However, in image and product searches, images are ordered by a decreasing score in row-major order. There is a variety of evidence suggesting that the user's eye scans don't go in row-major order. How does the eye scan the page?

Understanding how the user's eye scans the page is an important research topic for companies in the search engine business, especially for advertisement. The most important question is how should the objects in the results page be laid out? Dr. Raghavan stressed the need for a more general 2-d layout where the objects are laid out more heterogeneously in the results page. Considering the results page as 2-d real estate,

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the problem then boils down to boosting the richer use of this 2-d real estate, and optimizing every pixel. Given the results of the query, how should the objects be placed on the results page, what is the best layout that optimizes the 2-d representation? And what does best mean? For instance, in a 1-dimensional classical search, the top scoring object is placed at the top of the page. A 2-d analog of this is sought.

Actually, the problem goes beyond image/product results matrices. The visual cues that drive the eye tracking in search engines are not very well understood. They can log the user's click trails, but they can't log why they click what they click. They decided that combining eye gaze trails with click logs might yield a better approach to this problem.

Researchers at Yahoo! formulated eye scans as a Markov chain, M, where each slot is a state and at each state, the user may click, stop, or proceed to the neighboring slots. The measure of the best layout is the expected total score of objects seen. Given Markov chain M and a set of objects where each object has a utility and a stopping probability, the utility of that object increases when a user clicks on an object. The problem then becomes an optimization problem of finding an embedding of objects that maximizes the expected total user utility. This model also models the revenue maximization for placing advertisements on a website, the ultimate goal of the search engine companies. This model is of course subject to some criticism, since the probabilities may depend on surrounding images.

Another obstacle in this model is that the underlying Markov chain is not known. Although, the user's click sequence (trails) on a query is known and the Markov chain can be estimated from these queries, the problem is that successive clicks may not be on adjacent slots. Maximum likelihood model estimation of this problem is NP-hard, despite the grid structure.

Experimental results with Markov chain inference validate the eye-tracking observations that the user's eye scans don't go in row-major order. Apparently, the user's eyes gaze the web page within what they call a golden triangle towards the upper left corner of the results page, rather than a row-major tracking. The researchers at Yahoo! also found out a silver triangle towards the bottom right corner of the results page. Guess what? User's eyes also scan the bottom right corner of the results page to go to the next page!

Designers at Yahoo devised a fast placement algorithm called HIT that computes the hitting times of the slots in M and orders objects by decreasing score in increasing order of hitting times. HIT dominates all the other simplistic algorithms such as EIGEN, COLUMN and ROW by stating the ordering from the Markov chain independent of images to be placed.

These findings prove that it is possible to combine observational and click mining. Dr. Raghavan concluded his talk by stating that more experiments are needed, especially with non-grid layout. He also stressed the difficulty of Markov chain estimation with a non-grid layout.

Feature

IAPR Fellows

The prestigious IAPR Fellow Award was introduced in 1994 and since then is biennially conferred on persons to acknowledge their distinguished contributions to the field of pattern recognition and to IAPR activities.

According to the Constitution and Bylaws of IAPR, the number of fellows elected every two years must not exceed 0.25% of the total IAPR membership. Both service to IAPR and scientific contributions to the field of pattern recognition are taken into account in the selection process.

The IAPR Fellow Committee is in solicits nominations of high quality and performs the selection process.

The 2010 IAPR Fellow Committee: Walter Kropatsch, IAPR Fellow (Chair), Bhabatosh Chanda, IAPR Fellow, Ranga Kasturi, IAPR Fellow, Seong-Whan Lee, IAPR Fellow, Mark Nixon, IAPR Fellow, Gabriella Sanniti Di Baja, IAPR Fellow

Timothy Francis Cootes	For contributions to the development of statistical models of shape and appearance
Gian Luca Foresti	For contributions to image processing and pattern recognition in video surveillance systems
Dmitry B. Goldgof	For contributions to computer vision, pattern recognition, and biomedical engineering
Lawrence O'Higgins Hall	For contributions to approximate knowledge integration into learning
Jianying Hu	For contributions to pattern recognition methodologies and applications and service to IAPR
John Illingworth	For contributions to image processing and computer vision
Fumitaka Kimura	For contributions to handwriting recognition and its applications
Malay Kumar Kundu	For outstanding contributions in the development of theory, techniques, and applications of image processing using soft computing and related mathematical methods
Xuelong Li	For contributions to pattern recognition and image analysis
Wenyin Liu	For contributions to graphics recognition, performance evaluation, document analysis, and approaches to anti-phishing and service to IAPR
Jiebo Luo	For contributions to contextual inference in semantic understanding of images and video
Davide Maltoni	For contributions to biometrics and fingerprint recognition
Majid Mirmehdi	For contributions to image understanding and computer vision and service to IAPR
Shigeru Sasaki	For contributions to image processing and its applications in industry
Raimondo Schettini	For contributions to pattern recognition research and color image analysis
Mohan Manubhai Trivedi	For contributions to vision systems for situational awareness, intelligent robotics, and human-centered vehicle safety systems
Richard Charles Wilson	For contributions to structural pattern recognition

Congratulations!

Feature
ICPR 2010 Awards

The recipients of the ICPR 2010 Awards are listed on this and the next two pages.

Congratulations
to all
ICPR 2010 award winners!

Best Industry-Related Paper
Jorge Moraleda and Jonathan J. Hull
for the 20th ICPR Paper
Toward Massive Scalability in Image Matching

Piero Zamperoni Best Student Paper Award
Xiaojie Guo
for the 20th ICPR Paper
Triangle-Constraint for Finding More Good Features
by Xiaojie Guo, Xiaochun Cao

Best Biometrics Student Paper Award
Worapan Kusakunniran
for the 20th ICPR Paper
Multi-view Gait Recognition Based on Motion Regression using Multilayer Perceptron
by Worapan Kusakunniran, Qiang Wu, Jian Zhang, Hongdong Li

(Continued on page 19)

(Continued from page 18)

Best Scientific Paper Award: Computer Vision
Sabine Sternig, Peter M. Roth, and Horst Bischof
for the 20th ICPR paper
Inverse Multiple Instance Learning for Classifier Grids

Best Scientific Paper Award: Pattern Recognition and Machine Learning
Young-Beom Lee, Unsang Park, and Anil K. Jain
for the 20th ICPR paper
PILL-ID: Matching and Retrieval of Drug Pill Imprint Images

Best Scientific Paper Award: Signal, Speech, Image, and Video Processing
Pantelis Bouboulis, Konstantinos Slavakis, and Sergios Theodoridis
for the 20th ICPR paper
Edge Preserving Image Denoising in Reproducing Kernel Hilbert Spaces

Best Scientific Paper Award: Biometrics and Human Computer Interaction
Norman Poh, Josef Kittler, Sebastien Marcel, Driss Matrouf, and Jean-Francois Bonastre
for the 20th ICPR paper
Model and Score Adaptation for Biometric Systems:
Coping With Device Interoperability and Changing Acquisition Conditions

Best Scientific Paper Award: Multimedia and Document Analysis, Processing, and Retrieval
Andreas Fischer, Andreas Keller, Volkmar Frinken, and Horst Bunke
for the 20th ICPR paper
HMM-BasedWord Spotting in Handwritten Documents Using Subword Models

Best Scientific Paper Award: Bioinformatics and Biomedical Applications
M. Murat Dundar, Sunil Badve, Vikas C. Raykar, Rohit K. Jain, Olcay Sertel, and Metin N. Gurcan
for the 20th ICPR paper
A Multiple Instance Learning Approach toward Optimal Classi cation of Pathology Slides

(Continued on page 20)

(Continued from page 19)

IBM Best Student Paper Award: Computer Vision
Loris Bazzani
for the 20th ICPR paper
Multiple-shot Person Re-identification by HPE signature
by Loris Bazzani, Marco Cristani, Alessandro Perina, Michela Farenzena, and Vittorio Murino

IBM Best Student Paper Award: Pattern Recognition and Machine Learning
Robert J. Durrant
for the 20th ICPR paper
A bound on the performance of LDA in randomly projected data spaces
by Robert J. Durrant and Ata Kabán

IBM Best Student Paper Award: Signal, Speech, Image, and Video Processing
Sunyoung Cho
for the 20th ICPR paper
Adaptive Color Curve Models for Image Matting
by Sunyoung Cho and Hyeran Byun

IBM Best Student Paper Award: Biometrics and Human Computer Interaction
Ryo Yonetani
for the 20th ICPR paper
Gaze Probing: Event-Based Estimation of Objects Being Focused On
by Ryo Yonetani, Hiroaki Kawashima, Takatsugu Hirayama, and Takashi Matsuyama

IBM Best Student Paper Award:
Multimedia and Document Analysis, Processing, and Retrieval
Xujun Peng
for the 20th ICPR paper
Text Separation from Mixed Documents Using a Tree-structured Classifier
by Xujun Peng, Srirangaraj Setlur, Venu Govindaraju, and Ramachandrula Sitaram

IBM Best Student Paper Award: Bioinformatics and Biomedical Applications
Kien Nguyen
for the 20th ICPR paper
Automated Gland Segmentation and Classification for Gleason Grading of Prostate Tissue Images
by Kien Nguyen, Anil K. Jain, and Ronald L. Allen

IAPR Certificate of Appreciation
Herbert Freeman
For his contribution to the writing of the History of the IAPR

INSIDE the IAPR

Letter from the President

By Denis Laurendeau (Canada)

IAPR Executive Committee for the 2010-12 term: Past President Brian Lovell, Secretary Ingela Nyström, Treasurer Aytul Erçil, Second Vice President Tieniu Tan, First Vice President Kim Boyer, and President Denis Laurendeau.

It is a great honor for me to have been elected as President of the IAPR for the 2010-12 term. I have been involved in the IAPR since I participated in the organization of ICPR 2002 in Quebec City and have participated to ExCo activities as Secretary of the association since the ICPR in Cambridge in 2004. During these years, I have been in a position to witness the dynamism of the IAPR and to work with very dedicated persons on past Executive Committees, on standing and technical committees, and on the organizing committees of IAPR conferences and workshops. As a matter of fact, I would like to thank my colleagues on past Executive Committees for their dedication and hard work in making things work for the association and for the wisdom and experience they shared during these years.

During the next term, several initiatives will be conducted by the Executive Committee and other IAPR committees.

The Education Committee has done a tremendous job in making a significant bulk of material on pattern recognition and related fields available on the committee's webpage. An important job will be to make sure that this material is advertized even more in the scientific and research communities and to prepare the transition between the current implementation of the web access to the education material and a more permanent hosting service.

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An important issue that will also need to be addressed in this term is the admission in the IAPR of member societies coming from the same country. Multiple membership issues had been dealt with informally in the past, but recent requests for multiple memberships made it clear that such issues have to be dealt with more formally and be included in the IAPR Constitution and Bylaws. This will be a matter of reflection for the Membership Committee and the Constitution and Bylaws Committee. Recruiting new member societies will also be a priority of the ExCo and the Membership Committee for this term.

The Industrial Liaison Committee has worked on a new approach for collaboration between the IAPR and industry. An ambitious plan for collaboration has been proposed by the committee and the implementation of the first recommendations of the committee will start this term.

The Publication and Publicity Committee will maintain its contact with the journals associated with the IAPR name. An important issue that will have to be discussed by the Publication and Publicity Committee is its role as a promoter of the IAPR. Currently, the promotion of the IAPR is made through several channels such as the IAPR website, this Newsletter, IAPR sponsored and endorsed conferences and workshops, and the Publication and Publicity Committee. It would be important to have a better coordination between the different means that are put forward to promote the association. This is clearly a matter for reflection for the Publication and Publicity Committee.

The Conferences and Meetings Committee and the ICPR Liaison Committee will have to work closely with conference organizers, since the policy for submitting proposals to host the ICPR has changed and is now a two-step process. It will be important to keep track of the process for the preparation of ICPR 2014 in Stockholm in order to improve it and make it more efficient for future organizers.

Several years ago, the IAPR initiated its Travel Stipends Program for ICPR. This program aims at helping ICPR participants attend the conference by providing financial support for travel. During the 2008-10 term, the ExCo suggested that a scholarship program be created to support students interested in visiting research laboratories of collaborators in a different country for an extended period of time in order to enhance collaboration even further. The Governing Board has identified several other ways to promote collaboration between research laboratories. This will be a matter for reflection by the ExCo, the Education Committee, and the Conferences and Meetings Committee. As a matter of fact, requests for support for hosting summer schools have been received by the Conferences and Meetings committee but could not be considered since there are currently no provisions to either support or endorse such activities. Summer schools would indeed be a good way of promoting collaboration and are a topic worth investigating.

The priority set above should not prevent other activities or actions from being initiated in the 2010-12 term. The IAPR website lists the current IAPR Standing Committees and Technical Committees (http://www.iapr.org/committees/) which reflect the diversity of tasks and interests within the association. IAPR members are indebted to the Chairs and members of these committees who work very hard to make the IAPR a better association and an association which is growing and improving every year. For instance, the Advisory Committee, under the impetus of Prof.

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Herb Freeman, has prepared a document on the History of the IAPR (http://www.iapr.org/aboutus/history.php) that is of great interest to our community. The Advisory Committee has also recommended a Statement of Ethics that is now enforced for all events sponsored or endorsed by the IAPR.

I thank the Newsletter Editor, Prof. Alexandra Branzan-Albu, for her excellent work in publishing a very dynamic and interesting newsletter. Linda O'Gorman's participation in producing the *IAPR Newsletter* and in managing daily activities of the association is also acknowledged. The contributions of the IAPR Webmaster, Ed Sobzack, and of Prof. Sargur Srihari, who is providing computing resources to the IAPR, are also worth mentioning.

An objective of the ExCo is to encourage new scientists and researchers to participate in IAPR activities at all levels—conferences, standing committees, and technical committees. Consequently, ideas for making the IAPR even more active are welcomed by the ExCo and will be considered with great interest.

I wish all members of IAPR member societies an excellent 2010-12 term and hope that this period will be one of professional and personal growth.

BOOKSBOOKSBOOKS

Book reviews previously published in the IAPR Newsletter

Progress in Pattern Recognition, Series: Advances in Pattern Recognition, by Sameer Singh and Maneesh Singh, Editors *(reviewed in this issue)*

Algebraic Geometry and Statistical Learning Theory by Sumio Watanabe, Jul '10

Statistical Learning and Pattern Analysis for Image and Video Processing by Nanning Zheng and Zianru Xue, *Jul '10*

Augmented Vision Perception in Infrared: Algorithms and Applied Systems by Riad Ibrahim Hammoud, editor, Apr '10

Handbook of Texture Analysis by Majid Mirmehdi, Xianghua Xie, and Jasjit Suri, editors, Oct '09

Markov Random Field Modeling in Image Analysis By Stan Z. Li, Oct '09

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 by 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

(Continued on page 25)

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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

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

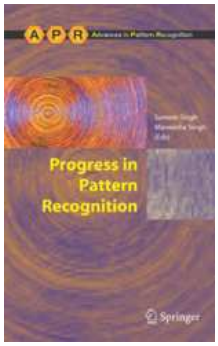
Machine Vision Books Jul. '05

CVonline: an overview, Apr. '05

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

Pattern Recognition Books, Jul. '04

BOOKSBOOKSBOOKS



Progress in Pattern Recognition

by Sameer Singh and Maneesha Singh (Eds.)
Springer, 2007
Series: Advances in Pattern Recognition

Reviewed by
Eleazar Jimenez Serrano (Japan)

The book is divided into two parts. The first part is about advances in machine learning, pattern recognition, data clustering and graph matching.

Nine interesting theoretical contributions are presented in the first section. Two articles cover the problem of graph matching; one focuses on attribute relational graphs and presents a combination of two existing search-algorithms (exhaustive and genetic) tested on artificially created data. The second one discusses the comparison and recognition of objects, and it presents a different vector extraction based distance function called energy function, but to me, the results are not that clear.

Machine learning is the common topic in the other articles. The first article of this section presents profound theoretical results on the problem of estimating probabilities using feedback for the binomial and multinomial case. Other ones focus on the possible practicability of such methodology in different scenarios. Training of supervised pattern recognition is used for detecting malicious intrusions in network traffic through raw packets from tcpdump traces. Training of supervised neural networks is applied for the prediction of membrane protein structure using existing protein datasets and binary encoding schemas of amino acid sequences. An ensemble learning based model is introduced for the problem of new expert addition and old expert retirement in pattern recognition under concept drift, with diversity measures based criteria for decision making. Comparison of learning algorithms for feature extraction of infrasound signals using neural networks deals with discrete wavelet transforms, time scale spectra, and cepstral coefficients and their derivatives.

Another two articles in the first section cover related subjects. Symmetry-based clustering is applied using a new distance measure for indicating the appropriateness of datasets in a validity index. Prediction engineering and a risk limitation model for quantifying investment risk in the stock market are tested using historic data and suggestions for implementation are given.

The second part of the book has sixteen articles about advances in biometrics with pattern recognition and data mining. All of them present interesting applications, extensions and modifications to existing methodologies.

Linguistics and character recognition research are found in six documents:

1. Lexicon-based algorithm labeling anomalous documents for detecting potentially criminal behavior (terrorist activities) from data in web documents,

2. Artificial neural network for Ethiopic character recognition trained with string patterns to handle character variations,

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3. One-stroke character recognition using a directional features recognition method,

4. Support vector machine for number plate recognition,

5. Two semi-supervised learning methods and one statistical hidden Markov model are evaluated for the named entity recognition system used for Bengali language identification,

Offline segmenting hand-written Farsi/Arabic overlapped or connected words for automatic text recognition, using a large database of pre-processed handwritten Arabic words.
Six documents cover the recognition in biometrics via video and audio. An extensive paper presents a generic learning machine in convolutional neural networks for face image processing, used in face detection, facial feature detection, face alignment, gender classification, and face recognition. Other papers deal with pattern recognition and clustering of facial thermal features for classifying affecting states; optimization of principal component analysis by reducing the dimension of images for face recognition; clustering of skin pixels for training a face detection and recognition classifier in order to discriminate unknown faces and using a probability vector based filter; simplification of iris identification algorithm for the implementation in low cost devices, without compromising its recognition capabilities; and a learning machine in the form of a coupled hidden duration semi Markov model for conversational audio data analysis and its classification.

Finally, scenery and image analysis is covered in four papers.

1) Pattern recognition for 2D barcode PDF417 reading and processing using a CCD camera and not the conventional laser scanning devices.

2) Binarization for image processing of cheques in Persian language using Otsu and Background Subtraction algorithms, and trained with a database of 150 cheque images.

3) Audio and video fusion for indoor and outdoor scene recognition with the purpose of its classification, and a learning machine trained with a database of sampled videos taken from a digital video camera.

4) A decision tree method for identification of horror movies based on shot-length and motion intensity features obtained from video analysis, for the intelligent indexing of multimedia database.

Although in my opinion many articles could have presented more proper conclusions or deeper proofs and evidences, and some of them focused on the practicability of machine learning and pattern recognition from a theoretically point of view, the scientific relevance of the content of the book is good. The authors presented their work at the International Workshop on Advances in Pattern Recognition 2007. Accordingly, the target audience is also academic. .

The book would have benefitted from correcting some editing errors and grammatical mistakes, though.

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:

Grammatical Inference: Learning Automata and Grammars
Colin de la Higuera
Cambridge University Press, 2010
www.cambridge.org/catalogue/catalogue.asp?isbn=9780521513463

Symbol Spotting in Digital Libraries: Focused Retrieval over Graphic-rich Document Collections
Marçal Rusiñol and Josep Lladós
Springer, 2010
www.springer.com/computer/image+processing/book/978-1-84996-207-0?changeHeader

More Free Books listed at the
Springer web site
http://www.springer.com/new+%26+forthcoming+titles+%28default%29?SGWID=3-40356-404-173623245-4205&originalID=173623245&searchScope=books&sortOrder=pubdatedesc

More Free Books listed at the
World Scientific web site
http://www.worldscibooks.com/compsci/mvpr.shtml

Letters...

I asked the experts at Grammarphobia.com, “At what point did the definition of the word "fingerprint" expand to include any distinctive set of characteristics that can identify something?

I share their response below.

~Linda O’Gorman, IAPR Newsletter Layout Editor and Contributor
(see “Fingered and Fingerless Fingerprints”, *IAPR Newsletter*, July 2010

Grammarphobia.com

You’ll be surprised to hear this, but the term “fingerprint” was used in a wider, figurative way BEFORE Scotland Yard began using fingerprints to identify criminals.

The first published reference for the term in the *Oxford English Dictionary* (from an 1859 issue of the North American Review) uses it in the literal sense of an impression made by a finger.

The citation refers to the Swiss Chapel of St. Verena, “where the finger-prints of the young maiden still remain in the rock, showing how desperately she resisted the Devil, who sought to carry her off.”

However, the next reference in the *OED* uses the term in a broader figurative sense.

In an 1884 article in the journal Christian World, Dr. Joseph Parker writes: “There is something about the word ‘dogma’ which seems to bear the finger-prints of the pedant or the priest.”

(We’ve gone to the originals to expand on the two *OED* citations above.)

The first citation in the dictionary for the use of the term in reference to a system of identification is an 1891 comment by Sir Francis Galton about his “collection of analysed finger-prints.”

A year later, Galton published the book *Finger Prints*, which laid out a technique for classifying fingerprints.

In 1897, Sir Edward Henry modified Galton's system, and it was adopted by Scotland Yard in 1901.

Although the use of fingerprints for identification has been around since ancient times, fingerprinting as we think of it today didn’t develop until the late 19th and early 20th centuries.

The first *OED* citation that refers to “the finger-print system of identification” is from a 1903 issue of the British newspaper the Daily Chronicle.

Thanks for a wonderful question, and all the best.

Pat O'Conner & Stewart Kellerman
Grammarphobia.com

Conference Planner: 2010

*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.			
2010			
AND 2010	4th Workshop on Analytics for Noisy Unstructured Text Data	Toronto, Canada	26 Oct 10
CIARP 2010	15th Iberoamerican Congress on Pattern Recognition	São Paulo, Brazil	8-11 Nov 10
ACCV2010 *	10th Asian Conference on Computer Vision	Queensland, New Zealand	8-12 Nov 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
DICTA 2010	International Conference on Digital Image Computing: Techniques and Applications	Sydney, Australia	1-3 Dec 10
ICVGIP 2010 *	Seventh Indian Conference on Computer Vision, Graphics, and Image Processing	Chennai, India	12-15 Dec 10

Conference Planner: 2011

Highlighting indicates that paper submission deadline has not yet passed. An asterisk * denotes a non-IAPR event.			
2011			
MMM 2011 *	17th International Conference on Multimedia Modeling	Taipei, Taiwan	5-7 Jan 11
DRR 2011 *	Document Recognition and Retrieval XVIII Part of the IAS&T/SPIE International Symposium on Electronic Imaging	San Francisco, California, USA	23-27 Jan 11
DGCI 2011	16th IAPR International Conference on Discrete Geometry for Computer Imagery	Nancy, France	6-8 Apr 11
CCIW 2011	2011 Computational Color Imaging Workshop	Milan, Italy	20-21 Apr 11
GbR 2011	TC-15 Workshop on Graph-based Representations in Pattern Recognition	Münster, Germany	18-20 May 11
SCIA 2011	17th Scandinavian Conference on Image Analysis	Ystad Saltsjöbad, Sweden	23-27 May 11
MVA 2011	12th IAPR Conference on Machine Vision Applications	Nara City, Japan	13-15 Jun 11
MCS 2011	10th International Workshop on Multiple Classifier Systems	Naples, Italy	15-17 Jun 11
CAIP 2011	14th International Conference of Computer Analysis of Images and Patterns	Seville, Spain	29-31 Aug 11
ICIAP 2011	16th International Conference on Image Analysis and Processing	Ravenna, Italy	14-16 Sep 11
GREC 2011	9th IAPR International Workshop on Graphics Recognition	Soeul, Korea	15-16 Sep 11
ICDAR 2011	11th International Conference on Document Analysis and Recognition	Beijing, China	18-21 Sep 11
IJCB 2011	IEEE/IAPR International Joint Conference on Biometrics	Washington, DC, USA	26-28 Sep 11
CIARP 2011	16th Iberoamerican Congress on Pattern Recognition	Pucón, Chile	15-18 Nov 11