INTERNATIONAL ASSOCIATION FOR PATTERN RECOGNITION

IAPR Newsletter

www.iapr.org

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In this issue...

Newsletter Editor: Larry O'Gorman *logorman@avaya.com*

Calls for Papers

DICTA 2005
Digital Image Computing: Techniques and Applications
Cairns Convention Centre, Cairns, Queensland, Australia
Deadline: July 31, 2005
December 6-8, 2005

IVCNZ05
Image and Vision Computing New Zealand 2005
University of Otago, Dunedin, New Zealand
Deadline: September 12, 2005
November 30-December 2, 2005

DAS 06
Document Analysis Systems
Nelson, New Zealand
Deadline: September 15, 2005
February 13-15, 2006

IWFHR 06
10th International Workshop on Frontiers in Handwriting Recognition
La Baule, France
Deadline: September 15, 2005
October 23-26, 2006

ICPR 06
18th International Conference on Pattern Recognition
Hong Kong
Deadline: December 15, 2005
August 20-24, 2006

S+SSPR 2006
11th International Workshop on Structural and Syntactic Pattern Recognition (SSPR 2006)
6th International Workshop on Statistical Techniques in Pattern Recognition (SPR 2006)
Hong Kong
Deadline: ?, 2006
August 17-19, 2006

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

Feature Article

Pattern Recognition in Traffic Engineering

By Larry O'Gorman

Photo credits:

All photos in this article are from the Toronto Highway 407 ETR (Express Toll Route).

While driving north of Toronto last winter, I took a turn onto Highway 407, a toll road. As I drove, I was surprised to see no tollbooths, and I did not to have to stop or slow down to pay a fee. Instead, there were frame structures over the road with cameras mounted on them. As a pattern recognition person, I was pleased and impressed at the technology that evidently captured license plates by which to allocate toll charges. A few months later, while driving in London, I took a wrong turn into the "congestion zone" in London, for which drivers require a permit – which I did not have. I reversed my path as quickly as I could, but not before a camera had captured my license plate. I found this out later as I received a ticket in the mail. I was less pleased with the technology this time, but still impressed by its efficiency and determined to find out the story behind it.

Dr. Panos Michalopoulos is a professor of civil engineering at the University of Minnesota whose field of expertise is traffic engineering. He is also founder of Image Sensing Systems, a pioneering company in the development of machine vision systems for traffic management and control. I spoke with him to learn more about these cameras, their early development, and their use of machine vision and pattern recognition techniques.

As Panos described to me, automobile detection devices are not new. The first sensor dates back to 1928, a simple switch that made contact due to the car's weight as it drove overtop. The devices used commonly today are magnetic or inductive loops, placed just beneath the road's surface, that detect the metal of a car. You can observe these by the rectangular cuts in pavement, often in lanes entering an intersection. Loop detectors have been used since the 1950s. As effective as this technology has proven to be over the years, there are several shortcomings. Once a loop is inserted in the road, it cannot be moved. To obtain extra 2-D spatial and 3-D space-time information, more sensors must be installed: an expensive solution.

In the early 1980s, Panos was already very familiar with the problem of traffic engineering. His Ph.D. thesis and early research dealt with models of the problems and issues involved in this area. Although theoretically very efficient, there was an element lacking: there was no way to prove and use the solutions because they required more information than the inductive loops could practically provide. Panos knew that he needed a better means for capturing real traffic scenes, but his civil engineering education provided no background to the sensing solution. Through a colleague at Honeywell, he learned of the field of machine vision. It was evident that the solution lay within this area, but the field was in its adolescence. At that time, machine vision was barely able to track a single object in motion. Furthermore, it was constrained to small or low-resolution images due to lack of computing power. Undeterred, Panos and his colleagues founded the company Image Sensing Systems and undertook the challenge of building practical vision systems for traffic detection.

Those readers who have designed image analysis systems will recognize familiar challenges. The first chal-

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lenge was to separate cars from the road background. Easier said than done as they struggled to make the systems robust with respect to day and night lighting, rain and snow backgrounds, and shadows and reflections. Another challenge was the absence of fast, inexpensive, and small computers. To meet time and cost requirements, they developed an innovative solution, which they called detection lines. Cars were not recognized and tracked in 2-D; instead they were detected as they crossed these lines. This solution reduced computation substantially because the 2-D analysis was reduced to several 1-D analyses, as several detection lines could be placed in a single image to capture traffic flow. Furthermore, unlike physically static loops, these lines could be placed and moved interactively by traffic engineers at a computer console (versus a paving crew on location!). By 1989, they had a prototype traffic detection box, which consisted of one or more cameras, a processor board, and weather-resistant housing. The device was called an Autoscope.

Panos describes the first major installation in Oakland County, Michigan, as having inauspicious beginnings. There was a giant American flat at an intersection where the Autoscopes were installed. The flapping of the flag frequently obscured the camera views causing utter confusion for the analysis algorithms. This noise had not been anticipated. There were many more learning experiences as theory and laboratory design were adapted for real conditions. By the early 1990s the system was robust and began selling well.

With much more powerful computers today, 2-D zones, rather than lines, are placed in the images. Via multiple virtual detectors in an image and multiple cameras, 100 or more sub-images can be captured and processed by a single processor. Personnel can place and change locations from a remote location. The detection signals can also be enabled and disabled by time or by captured events. More sophisticated algorithms can measure speed, volume, road occupancy, and vehicle classification. This information can be important not just for traffic control, but for several other traffic-related tasks such as monitoring for accidents and congestion, collecting traffic data, and reducing air pollution and fuel consumption.

Oakland County now has more than 800 intersections outfitted with Autoscopes. Throughout the world, there are over 35,000 cameras deployed in more than 50 countries.

Now, when you drive onto a booth-less toll road (or enter London's congestion zone), be assured that your car will be detected. You can thank the pioneering work of researchers like Panos Michalopoulos who have applied machine vision and pattern recognition techniques to this area of traffic engineering.

For more information on topics in this article:

Professor Michalopoulos' web page:
www.ce.umn.edu/people/faculty/michalop/

Photos of the cameras on Highway 407 in Toronto:
Toronto 407 ETR web site:
www.407etr.com/about/photogallery.asp

Web site of Declan McCullagh, photographer:
www.mccullagh.org/theme/toronto-toll-road-highway-407.html

Technical papers describing Autoscope®:
www.autoscope.com/techpapers.htm

Image Sensing Systems' web page:
www.imagesensing.com/

IAPR Publicity and Publications (PPC) Committee: The New IAPR Website

By Sargur Srihari and Edward Sobczak

The *publicity* responsibility of the IAPR PC Committee is primarily the design and maintenance of the IAPR website. The *publications* responsibility is mainly handled by the editors-in-chief of three IAPR sponsored journals: *Pattern Recognition Letters*, *Machine Vision and Applications* and the *International Journal of Document Analysis and Recognition*. Each editor makes an annual report about their respective journal to the committee chair which is then presented to the IAPR Executive Committee. In this article we will report on the new IAPR website.

Over the past year many updates have been made to the IAPR website (*www.iapr.org*). The web server has grown to contain nearly 250 MB of data and the overall appearance and organization of the public website has changed dramatically. Updates are continually being processed as requested by the officers and members of the IAPR community.

IAPR Home Page

Website Host

Early this year the entire IAPR website was moved from its old home in Prague, where it was maintained for many years as a service to IAPR by Michal Haindl, to the United States. The main website is now served from the Center of Excellence for Document Analysis and Recognition (CEDAR) at the State University of New York at Buffalo. The website was transferred between servers over the period of November 2004 to January 2005, during which time content was updated and formatted to fit a new visual design. The public site was merged with the IAPR members' site already hosted by CEDAR, and updates were made to menu listings and page organization. Updates to information and functionality continue to be made frequently in order to evolve the website into a useful and informative tool for the IAPR community.

Members Only Section

The intent of the IAPR public website and member's area is to consolidate general interest information and to maintain links to other more specialized websites, such as member societies and IAPR technical committees. The website contains information describing many aspects of the organization, including conference dates, committee and member listings, sponsored awards and application information. Executive

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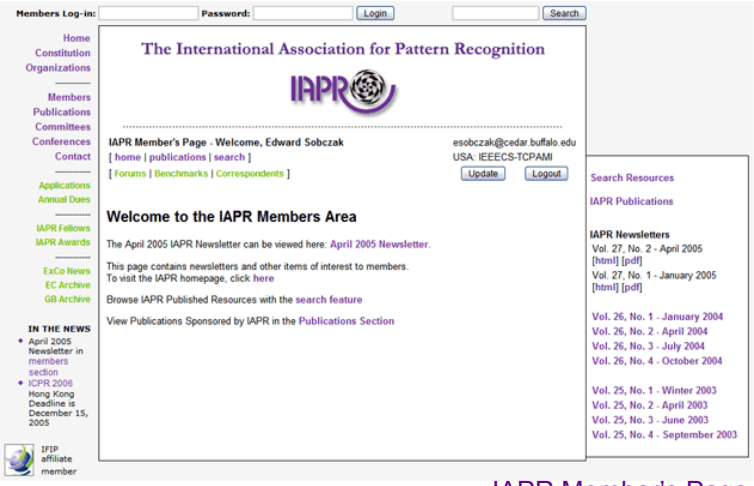

IAPR Member's Page

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Committee and Governing Board Archives are also available to members of the appropriate groups. The IAPR Member's section, once separately hosted by CEDAR, has been combined with the main IAPR website. The IAPR member's area was implemented in order to provide a location where society members could access information that would not be made readily available to the general public. The membership database currently contains 360 individuals in 34 member societies from around the world. Currently the IAPR Member's website provides several services to members including an IAPR news and announcements section that is used to list upcoming events or other pertinent information for IAPR members. The IAPR sponsored publications section allows members access to relevant periodicals, including the *IAPR Newsletter*, in html and PDF formats. The published resource database has grown to encompass fifteen conferences catalogued by IEEE Computer Society, including ICDAR, ICIAP, ICPR and IWFHR conferences since 1995, and contains over 250,000 entries indexing thousands of papers. To register, members can enter an email address and password at the main website. They can optionally include name, membership number and society.

Future Plans

In the future, interfaces will be designed to allow designated members to make their own updates to web page content. Web hosting companies have been contacted and a solution is being selected. The primary improvements for the IAPR website have been identified as:

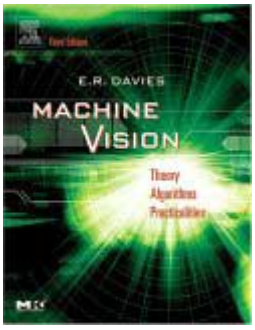
- a need to have the IAPR website hosted at a location accessible to changing leadership,
- an administrative interface which will allow designated IAPR members to update and maintain specific sections of the website, and
- a design which will convey IAPR's status as a global organization with widespread technical interests.

Each company has been asked to provide a detailed report describing their solution. These specifications are currently being reviewed.

Machine Vision Books

By: Larry O'Gorman

Twenty years ago in the field of images, there were only image processing books. Then came the first book devoted mainly to higher-level image methods, Ballard and Brown's, *Computer Vision*. Since then, there have been a number of books on image processing and analysis at its various levels. Two books have recently been published, both titled *Machine Vision*. I was interested in seeing how the texts in this field have evolved and at which audiences they are aimed.



E.R. Davies' Machine Vision Theory, Algorithms, Practicalities

At the risk of sounding trite, the first word that comes to mind when first seeing E. R. Davies book *Machine Vision Theory, Algorithms, Practicalities* is *big*. It is 934 pages, 29 chapters. The second word, after examining the book, is *understanding* – and this explains the length. Davies makes a conscientious effort not just to teach the various methods of computer vision but to convey an understanding of these. This is done with excellent explicative text and figures as well as detailing the finer points of applicability, pros and cons, alternatives, and practicalities. This is not a book that is heavy in rigorous definitions or mathematics; instead it is heavy in clear and intuitive explanation. The popularity and usefulness of this style is evident as this book, originally published in 1990, is now in its 3rd edition (2005). The book has well-deserved longevity.

One of the ways that understanding is conveyed here is by application case studies. These include: monitoring vehicle traffic, animal tracking, vehicle guidance, food quality inspection, and noise suppression in neural networks. A handy table in the front flap identifies each application and some of the methods used in each. For those who learn best by example and for those practitioners with objectives similar to those of the described applications, this feature is very useful.

The book is organized by parts and chapters. Part 1, "Low Level Vision", includes topics such as filtering, thresholding, edge detection, and morphology. Part 2, "Intermediate Level Vision", includes line, circle, ellipse, and hole detection. Part 3, "3-D Vision and Motion" includes perspective, motion, and camera calibration. Part 4, "Toward Real-time Pattern Recognition Systems" includes visual inspection systems (with plenty of examples), statistical pattern recognition, neural networks, and real-time hardware systems. Finally, Part 5, "Perspectives on Vision", ascrnds one level above the methods and examines the approach in specifying and designing vision systems. It is here, in a chapter called, "Machine Vision: Art or Science" that Davies adds to and sums up some of his overriding advice on designing vision systems.

The wide breadth of coverage includes some topics that (to my experience) are not widely employed now (such as SIMD systems). There is one missing topic: there is no formal treatment of scale-space (multiresolution, or Gabor filtering) techniques.

If a person is to buy one book on machine vision and its related topics (such as statistical pattern recognition and vision architectures), this is a good choice. As a student text, this is appropriate for the undergraduate level or as a first course at the graduate level. Practical problems are included with each chapter. As an advanced text, it should be complemented by papers from current literature. For practitioners, especially those from other fields, this book offers a single source to easily find a topic, learn it, and understand it by example. The absence of a software CD with this book means that student or practitioner will have to obtain programs elsewhere.

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Snyder and Qi's *Machine Vision*

A new book, *Machine Vision* by Snyder and Qi, is squarely aimed at students taking a first course in computer vision. The book is much shorter than Davies book (433 pages), and does not include the treatment of several applications discussed by Davies. The book does include more formal mathematical explanations of methods as befits a student text. More pointedly for a student text, this book contains several assignments, located throughout each chapter with associated topics. The assignments are well-designed to convey understanding through solution and practice. Also included with this book is a CD, containing image software, assignment material, images and documentation.

The authors state in the introduction that they have endeavored to write conversationally and entertainingly for the student. I imagine that students would enjoy some of the jokes and quotes. My favorite quote is from Julius Caesar for the Segmentation chapter, "Galia est omnes divisa in partes tres." (All of Gaul is divided in three parts.)

Professors are tasked with beginning a course with review material to make sure that all the students start on the same page. This book actually provides this as Chapter 2. In Chapter 3, some programming basics are discussed and the Image File System (IFS) software package is introduced. After this introductory material, the book describes linear operators and kernels, using a classic digital signal processing progression. Edge detection and scale space are handled in this chapter. The next chapters are: image relaxation, mathematical morphology, segmentation, shape labeling, and parametric transforms (mainly the Hough transform). After these chapters, the book steps up one level to intermediate level vision (the book is not organized in parts as is Davies') to describe graphs, matching, and statistical pattern recognition, clustering, and syntactic pattern recognition. Finally, a few applications are briefly discussed (in 4 pages) in one chapter and the final chapter is devoted to automatic target recognition.

I found that this book has sufficient material for a student text. I liked the writing style, the many figures and diagrams, and many images included on the CD. This is not a cookbook meant for a practitioner, although I imagine after taking a course using this as the text, that the book and CD would be very useful for that student who ended up working in machine vision.

I liked both of these books and believe either would make an excellent choice for their intended audience.

Can you help?
Pattern Recognition of Designs in Archeological Ceramic Sherds

By: Scot Keith
scotkeith@Southres.com

Ed Note -- This is the second article in the *IAPR Newsletter's* "Can you help?" series. The debut article appeared in the April 2005 issue and discussed "Pattern Recognition in Cryptic Wildlife Species". This article can be viewed in html and in pdf format.

In this issue, we address the issue of design pattern recognition in archeological ceramic sherds.

If there is anyone in the *Newsletter's* readership who has worked on a problem such as this before or who has interest and knowledge to do so, please contact Scot Keith directly.

We are conducting an archeological excavation at a significant prehistoric Native American village site located in Georgia in the southeastern United States (see *www.bartowdig.com*).

Ceramic sherds are one of the most prolific artifact types at the site. Many of these are decorated on the exterior surface with designs termed "complicated stamped". This intricate pottery was produced by people of the Swift Creek culture, roughly dating from 100 B.C – 800 A.D. Complicated stamped designs are generally composed of curvilinear geometric motifs, such as concentric and nested circles, figure eights, connected diamonds, spirals, and numerous other combinations. Prehistorically, these designs were carved into wooden paddles, which were then used to stamp the exterior of ceramic vessels. Based on studies of individual sherd designs, as well as imperfections in the designs, archeologists believe that each design was exclusive to a single paddle, similar to the individual nature of fingerprints. Furthermore, archeologists have found the same design at sites hundreds of kilometers apart, indicating widespread trade and interaction networks. Based on the current archeological database of these complicated stamped designs, it is also believed that there are hundreds, if not thousands, of individual designs.

Given that we have recovered thousands of such complicated stamped sherds during our excavation, our hope is to be able to match identical designs across the site, as well with sherds from other archeological sites. We will be able to accomplish this partly through standard macroscopic/visual examination, yet we believe that computerized pattern recognition has the potential to greatly increase pattern matching of our artifact sample, similar to the manner that fingerprints are analyzed and matched.

If possible, the result of such a study would be of tremendous import not only for this particular project, but also for future ceramic studies. The ability to correlate designs at different areas of this large site would provide a wealth of information concerning such things as site structure (e.g., house patterns and layout, activity areas), kinship/clan relationships among site occupants, and ceramic vessel reconstruction. Correlating designs from different sites will bolster our knowledge of interaction networks among these communities, as well as the evolution of design patterns over time.

Several potential challenges may arise. One, due to the random breakage pattern of sherds, all of a design may not be represented on an individual sherd. Additionally, sherds which at the time of the vessel creation had the same design may evidence different portions of that design due to breakage patterns. Sherds (which by definition represent portions of a once-complete vessel) occur in all sizes, from less than ½" up to more than 5" in diameter. Furthermore, designs

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on some sherds may be faint or overstamped (overlapping designs due to paddling “carelessness”, for lack of a better word).

In order to mitigate these problems, we plan to examine larger sherds with clearly visible design patterns that are not overstamped. Also, we hope that pattern recognition will be able to match designs from different sherds with only a small amount of the same design present on each. In addition, we may use 3-D digital imaging of sherds in order to facilitate vessel reconstruction (which, if successful, would also help to match designs).

We would greatly appreciate any information, advice, and suggestions on the feasibility of this avenue of research, as well as on the tools (software, equipment, etc.) necessary to accomplish our goals.

Technical Committee Report: TC12 Multimedia and Visual Information Systems

Marcel Worring, Chair, TC12

Pietro Pala, Vice-

The ever increasing availability of digital information in the form of images, videos, audio, and 3D models demands the design and development of systems enabling effective exploitation and management of such information. This relates to how multimedia information can be coded, transmitted, and made available to users via high-speed networks, but also, and primarily, to how multimedia information can be stored and accessed. User access to multimedia—particularly visual—data is mainly based on high-level, semantic concepts, while automatic algorithms can extract only low-level features. Bridging this so-called semantic gap is one of the most challenging problems in enabling effective access to information in multimedia form.

Addressing these issues requires the contribution of many research disciplines and poses new research challenges to researchers in this field. Image/video analysis and processing, information retrieval, pattern recognition and computer vision, multimedia data modeling, multidimensional indexing, psychological modeling of user behavior, man-machine interaction, and information visualization, are not even all of the research fields that contribute to this new area of research.

IAPR's Technical Committee 12 (TC12) on Multimedia and Visual Information Systems promotes interaction among researchers working in modeling, design, and development of systems for the analysis, processing, description, and retrieval of multimedia, particularly visual information, as well as the applications of these systems in challenging domains. Activities of TC12 center round the topics of **benchmarking** and **education**.

Benchmarking: Progress in such a complex and diverse field as multimedia and visual information systems can only be measured if various methods can be compared against one another using objective benchmarks. This has been recognized widely in the field and many benchmarks are available. Different benchmarks focus on different aspects of the problem. The Amsterdam Library of Images focuses on retrieving images of objects when recorded under varying conditions. For Content Based Image Retrieval, BENCHATHLON has addressed many issues in benchmarking, including the search for edited or recompressed images originating from the same source. The previous TC12 chairs developed a benchmark focusing on semantic access to a picture collection. For video, the TRECVID benchmark addresses semantic access to the data, also. Clearly for video, techniques for indexing and search can make use of not only the visual, but also of the audio/speech channel. The Princeton Shape benchmark has a large collection of 3D models. TC12 aims to promote these benchmarks within the IAPR community and, in addition, will work on new benchmarks specifically focusing on methods that measure the effectiveness of the interactive retrieval process as a whole.

Education: Due to the variety of disciplines forming the basis for techniques in Multimedia and Visual Information Systems, education in this field is still a challenge. Often the topics are taught from, for example, a computer vision, machine learning, or visualization perspective. An integrated view on the topic requires knowledge of each of the contributing disciplines. Clearly having thorough knowledge of all these disciplines is unfeasible. Therefore, the TC12 will collect links and references to educational resources for both students and teachers, making it easier to study the problem in the genuine, multidisciplinary perspective. This will not be limited to papers and books, but will also include interactive materials and demonstrators that allow students to have interactive learning experiences.

We are taking the challenge to contribute to the progress of this exciting field, but of course can only do so together with you, our fellow researchers in the field. We invite you to visit the TC12 web site *www.science.uva.nl/~worring/TC12* for more information, and to contribute ideas and resources.

Conference Report: DGCI 2005

General Chair:
Eric Andres

12th International Conference on Discrete Geometry for Computer Imagery

13-15 April, 2005, Poitiers, France
Report Prepared by: Guillaume Damiand

DGCI was organized by the laboratory SIC - "Signal, Image, Communications" of the University of Poitiers, Centre National de la Recherche Scientifique and Technical Committee 18 of the International Association of Pattern Recognition (IAPR). The series of DGCI conferences started in 1991 and is now the main conference of IAPR TC18.

For this edition, Eric Andres was the general chair, Pascal Lienhardt the program chair and Guillaume Damiand the publications chair. DGCI 2005 was sponsored by the Faculty of Science, the University of Poitiers, the Region of Poitou-Charentes and the IAPR. The conference venue was the IFMI building on the Futuroscope campus ground in Chasseneuil du Poitou, near the Futuroscope park.

DGCI 2005 attracted many excellent papers with 53 submitted papers from 21 countries. After careful reviewing by two and sometimes three reviewers, 36 papers were accepted, from which 22 were selected for oral presentation and 14 as posters. The conference brought together 84 participants, coming from 17 countries. As usual at DGCI conferences, there was a low cost registration for students.

This year's conference was organized in conjunction with the 5th Workshop on Graph-based Representations in Pattern Recognition *(see related article on page 13).* The GbR workshop aims at using graph-based structures in image analysis. There is a strong connection between the community interested in the GbR workshop and the discrete geometry community. For this reason—and for the first time— GbR and DGCI were organized in the same place with a common session of four papers, two of which were submitted to GBR and two to DGCI.

The talk and poster sessions covered topics such as reconstruction and recognition, discrete topology, uncertain geometry, visualization, discrete models and transforms, morphology and tomography including various applications.

Three invited speakers showed new, important views in the field of discrete imagery: Prof. Achille Braquelaire gave a talk devoted to "Representing and Segmenting 2D Images by means of Planar Maps with Discrete Embeddings: from Model to Applications"; Prof. Peter Veelaert gave a talk on "Uncertain Geometry in Computer Vision"; and Prof. Jean-Pierre Guedon spoke about "The Mojette Transform: the First Ten Years". The conference was well organized, the program ran smoothly without any problem. The available infrastructure, including the audio/projections, computer equipment, Internet connection, worked according to high standard. The social program contained a reception and also a conference banquet, both of them had great success among the participants.

Proceedings of the conference are published by Springer in "Lecture Notes in Computer Science" #3429. Two special issues will come out soon: one in "Image and Vision Computing Journal" and the other in "Computer and Graphics".

The next DGCI Conference will held in Szeged, Hungary, November 8-10 2006, organized by the Dept. of Image Pocessinng and Computer Graphics, Univ. of Szeged, with Prof. Attila Kuba as General Chair.

For more information on IAPR TC18 Discrete GGeometry see *www.cb.uu.se/~tc18/*

Workshop Report: GbR 2005

Co-Chairs:
Luc Brun and Mario Vento

5th Workshop on Graph-based Representations in Pattern Recognition

11-13 April, 2005, Poitiers, France

Report Prepared by: Mario Vento, IAPR Tc-15 Chair

From April 11 to 13, the fifth edition of IAPR TC15's workshop on Graph-based Representations was held in Poitiers, France. From previous editions, we were already accustomed to a high quality of presented works, accompanied by a warm, friendly atmosphere favoring discussion and exchange of experiences and information. Thanks to the invaluable efforts by Luc Brun, this edition was wonderfully aligned to the high standards set by the past GbR workshops, even if the number of submitted papers significantly increased with respect to previous editions.

In order to accept all the deserving papers without loosing the "feeling" of the workshop by introducing parallel sessions or increasing the number of days, we experimented with having some authors present a very short oral introduction of their papers followed by a poster session where more details were provided. This experiment worked quite well, and this way of presenting the papers helped to keep the attention and the focus of the participants during the whole session.

Another innovation this year was the joint organization with the workshop on Discrete Geometry for Computer Imagery *(see related article on page 12).* One of the three days of GbR was devoted to a joint session with DGCI, with papers covering the borderline between the interests of the two communities. The success of this joint organization, which has drawn the interest of some DGCI members to GbR activities (and vice versa!), has induced us to decide to repeat this format for the next GbR edition, obviously choosing a different peer workshop. For this reason, we have not yet established the location of the next edition, waiting to receive proposals involving other workshops that will be held in 2007. Some interesting candidates have already been proposed.

Within the discussion panel on the future of GbR, the issue of creating a repository of datasets and algorithm implementations was discussed. This repository would help make the results of our research reproducible and comparable with other approaches. It has been suggested that in the future the reviewers of the papers submitted to our workshop should invite the authors, where it makes sense, to either use the datasets already in the repository for their experiments, or to share their own datasets through the repository. A few volunteers have given their availability to implement a first working version of the repository, limited to the very basic functionalities but sufficiently complete to allow us to start gathering data. The repository, as was pointed out during the discussion, could become an effective resource to make our activities more widely known outside of the TC15 and IAPR communities.

Other suggestions that emerged for promoting the visibility of TC15 was a tighter coordination with other technical committees (in order to avoid the useless duplication of common efforts) and the organization of a special session within larger conferences, even outside of the IAPR community. In particular, it was felt we should aim at reaching the research communities of Asian countries, which up to now have had only a marginal participation to our activities.

Also, it was suggested that we should exploit the proposal of Elsevier to publish textbooks on the subjects covered by IAPR; in particular we should try to use this opportunity to realize textbooks covering both the basic and the advanced aspects involved in the use of graph based representations.

For more information on IAPR TC15 Graph-based Representations see *www.iapr-tc15.unisa.it*

Conference Report: CRV 2005

Co-Chairs:
Robert Sim and Ioannis Rekleitis

2nd Canadian Conference on Computer and Robot Vision

9-11 May 2005, Victoria, British Columbia, Canada

Report Prepared by: Robert Sim

CRV 2005 was held May 9-11 in Victoria, British Columbia. Organized by the Canadian Image Processing and Pattern Recognition Society (CIPPRS), this IAPR sponsored event brought together researchers in vision, pattern recognition, medical imaging and robotics from across Canada and around the world. CRV, which was formally known as Vision Interface (VI), is co-located annually with Graphics Interface and Artificial Intelligence and has been gathering momentum as a first-rate vision conference over the past few years. Conference co-chairs Robert Sim from the University of British Columbia and Ioannis Rekleitis from the Canadian Space Agency observed that paper submissions were up significantly. "We've seen an increase in submissions of 31% over last year, and we think this is a positive sign, both for the conference and the community at large." said Dr. Sim. Dr. Rekleitis further noted, "We're also seeing increased international involvement, indicating increased recognition outside Canada".

The conference featured three days of single-track oral presentations with a parallel poster session. A special session on Intelligent Systems featured the best student paper, "Analysis of Selected Player Actions in Selected Hockey Game Situations" by Fahong Li and Robert Woodham of the University of British Columbia and the best paper award was given to Christian Bauckhage and John Tsotsos (York University) and Frank Bunn (StressCam Operations and Systems) for their work entitled "Detecting Abnormal Gait", a vision system for categorizing human behaviour. The slate of internationally recognized invited speakers included Baba Vemuri from the University of Florida, Dieter Fox from the University of Washington, and David Forsyth from the University of Illinois and UC Berkeley. Dr Fox presented his award winning work on probabilistic robotics, opening a new dimension of robotics-themed research highlighted by CRV.

The final day of the conference wrapped up with a workshop on face processing in video, organized by Dr. Dmitry Gorodnichy of the National Research Council of Canada and Aleix Martinez of Ohio State University. This work brought together several international researchers in video processing and human activity recognition.

"We're very excited by the renewed energy and direction of this conference." said CIPPRS president Gregory Dudek of McGill University. At the conference banquet Dr. Dudek presented an award for research excellence and service to the community to two prominent Canadian researchers: Professor James Little of the University of British Columbia and Professor Michael Jenkin of York University. "We're very grateful for their service and the recognition they've brought to the society through their outstanding research records." said Dr. Dudek.

CRV 2006 will be held June 7-9 next year in historic Quebec City.

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Conference Proceedings are available from the IEEE Computer Society, *www.computer.org*

Conference Report: MVA 2005

Co-Chairs:
Katsuhiko Sakaue and Mikio Takagi

9th IAPR Conference on Machine Vision Applications

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

Report Prepared by: Mikio Takagi and Katsuhiko Sakaue, Conference Co-Chairs and Yoshinori Kuno and In So Kweon, Program Co-Chairs

The Ninth IAPR Conference on Machine Vision Applications (MVA2005) was co-sponsored by the MVA Conference Committee, IAPR TC-8, and the National Institute of Advanced Industrial Science and Technology (AIST). There were more than 200 participants from 24 countries.

The topics of the conference were algorithms and architectures of machine vision applications. Due to the recent growth of these research topics, especially in ITS, human computer interaction, wearable computing, security and robots, 217 submissions were received. From these, 43 oral presentations and 102 posters were selected.

In addition to the accepted papers, There were three invited talks: “CHIL - Computers in the Human Interaction Loop” by Prof. Alex WAIBEL of Carnegie Mellon University, USA; “Cognitive Development in a Humanoid Robot” by Prof. Giulio SANDINI of University of Genova, Italy; and “Towards Flexible and Intelligent Vision Systems: From Thresholding to CHLAC” by Prof. Nobuyuki OTSU of AIST / University of Tokyo, Japan.

The first MVA workshop was held in Tokyo in 1988, and at every MVA conferences after MVA’98, the Most Influential Paper over the Decade Award is given to the authors of papers appearing in the conference of 10 years ago which have been recognized as having had the most significant influence on machine vision technology over the subsequent decade. At MVA2005, three papers presented at MVA’94 were selected for this award: “An Autonomous Three-Dimensional Vision Sensor with Ears” by Shigeru Ando, “Disparity Selection in Binocular Pursuit” by Atsuto Maki, Tomas Uhlin and Jan-Olof Eklundh and “Video Retrieval Method Using a Sequence of Representative Images in a Scene” by Akio Nagasaka, Takafumi Miyatake and Hirotada Ueda.

At the next MVA conference, we are looking forward to having excellent papers and discussions with many researchers from all over the world.

For more information on the MVA conferences:

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

Workshop Report: HIP 2005

Co-Chairs:
Henry Baird and Daniel Lopresti

2nd International Workshop on Human Interface Proofs

19-20 May, 2005, Bethlehem, Pennsylvania, USA
Report prepared by: Henry Baird and Daniel Lopresti

HIP 2005 brought together twenty-six researchers, engineers, and business people interested in technologies to protect networked services from abuse by programs (bots, spiders, phishers, etc.) masquerading as legitimate human users.

Attendees participated in an intensive day and a half of plenary talks, panels, and group discussions, sharing the state of the art and identifying urgent open problems. Nine regular papers (published in the refereed, on-site, 141-page, hardcopy proceedings) established the framework of discussion which embraced three broad topics:

- Performance Analysis of HIPs and CAPTCHAs
- HIP Architectures
- HIPs within Security Systems

Three working groups delved into the topics of "Evaluation Methodologies for HIPs," "Assuring High Performance in HIPs," and "Present and Future HIP Technologies."

Dr. Patrice Simard of Microsoft Research presented an invited talk on "HIP Design: Synthesis, Analysis, and Usability." At the workshop banquet, Dr. Andrei Broder of IBM Research gave the Keynote Address on "The Story Behind Patent No. 6,195,698 (the First CAPTCHA)."

Complete lists of the participants and the regular papers, details of the program, and slides of some of the talks are available at the workshop website: *www.cse.lehigh.edu/prr/hip2005*. Summaries of the working group discussions will be posted there soon.

The workshop was organized by Professors Henry Baird and Daniel Lopresti of the Computer Science and Engineering Department at Lehigh University. Local arrangements at Lehigh were assisted by Jeanne Steinberg, Michael Moll, Matt Casey, Don Delorenzo, Sui-Yu Wang, Tim Penge, and Derek Drake.

The workshop was endorsed by the IAPR and benefited from generous support by Microsoft Corporation.

HIP 2005 Proceedings are available from Springer-Verlag

H. S. Baird and D. P. Lopresti (Eds.), *Proceedings, 2nd Int'l Workshop on Human Interactive Proofs (HIP2005),* Bethlehem, PA, Springer-Verlag, Lecture Notes on Computer Science, LNCS Vol. No. 3517, Berlin, 2005. [ISBN-10 3-540-26001-3].

Conference Report: CORES 2005

Chairman:
Juliusz Lech Kulikowski

4th International Conference on Computer Recognition Systems

22-25 May, 2005, Rydzyna Castle, Poland

Report prepared by: Michal Wozniak

The goal of the CORES series of conferences is the development of theories, algorithms, and applications of pattern recognition methods. The series has served as a forum for the various groups working in area of pattern recognition to come together and help each other keep up with this active area of research.

CORES 2005 was organized by Prof.Marek Kurzyński and his team from Chair of Systems and Computer Networks at Wroclaw University of Technology. The conference was endorsed by International Association for Pattern Recognition (IAPR), its' Polish member society (Association for Image Processing, TPO), State School of Higher Vocational Education of Jan Amos Komenski in Leszno, and Leszno Society of Friends of Arts and Sciences. The beautiful environment or Rydyna Castle in Poland, the number of experts, the casual atmosphere, and the social events led to educational and energetic talks and discussions at CORES 2005.

This conference contained the usual excellent mix of theory, algorithms, and applications of pattern recognition methods. There were several plenary papers that neatly summarized the work that has been done so far and discussed the gaps that need to be filled.

Invited talks were presented on topics of increasing importance in our modern world:

- Prof. D. Chetverikov in "Description and Recognition of Dynamic Textures" presented a review of the dynamic textures analysis problem,
- Prof. R. DUIN in "Open Issues in Pattern Recognition" sumarized the works that have been done so far in pattern recognition and pointed at the areas that need be expanded.
- Prof. J.L.KULIKOWSKI presented new possibilities of "Application of Ontological Models in Pattern Recognition"
- Prof. J. OOMMEN in "New Trends in Pattern Recognition Using Chaotic Neural Networks" described his own idea of chaotic neural networks.
- Prof. P. PUDIL and Dr P. SOMOL in "Current Feature Selection Techniques in Statistical Pattern Recognition" summarized works in the area of feature selection.
- Prof. R. TADEUSIEWICZ and Prof. M. OGIELA presented "On Automatic Understanding," in which they showed the next step of image analysis – image understanding on the base on scene context.

The talks and discussions of CORES 2005 gave the attendees an excellent overview of the work done in the field of pattern recognition methods as well as new problems to focus on. Some of young presenters were awarded for their presentations:

- The first best presentation award goes to Elzbieta Pekalska for her work "Pairwise Selection of Features and Prototypes"
- The second best presentation award goes to Ewa Lukasik for her work "Wavelet Packets Features Extraction and Selection for Discriminating Plucked Sound of Violins"
- The third best presentation award goes to Henryk Maciejewski for his work "Clustering DNA Microarray Data".

Additionaly eight distinctions were announced.

The next CORES will be held in Poland in May 2007.
Please visit *cores.pwr.wroc.pl*
for further developments and to see the pictures of this year's event.

Workshop Report: PRIS 2005

Chair:
Hugo Gamboa

5th International Workshop on Pattern Recognition in Information Systems

24-25 May 2005, Miami, Florida, USA
Report prepared by: Hugo Gamboa

The quantities of information available in digital format are exploding in our time. Universities, enterprises and governments have accumulated this information in many diverse multimedia formats, and are asking for systems or models capable of extracting structure or meaning from the data. Pattern recognition (PR) and machine learning (ML) techniques provide formal frameworks in which this class of problems can be adequately addressed. On the other hand, exploratory analysis (data mining) and content-based retrieval of multimedia data serve both as important practical application domains for PR and ML techniques, and as a source of challenging research problem.

The main aim of the International Workshop on Pattern Recognition in Information Systems (PRIS2005) is to bring together researchers, practitioners and potential users with interests in the multidisciplinary field of applications or foundations for Pattern Recognition in Information Systems.

The PRIS workshop series was initiated in 2001 initiated by Ana Fred (Instituto Superior Técnico, Portugal) and Anil K. Jain (Michigan State University USA). After crossing some European countries, this edition was the first on the other side of the Atlantic. The workshop was born in the context of and in conjunction with the International Conference on Enterprise Information Systems (ICEIS).

PRIS 2005 was composed by several sessions of oral presentation and a poster session, summing a total of 22 presentation (14 oral and 8 posters). The oral sessions focused on learning, image recognition, electronic surveillance, and document classification. As in previous editions, PRIS 2005 was sponsored by the prestigious International Association of Pattern Recognition (IAPR).

Two distinguished researchers gave brilliant keynote talks. The opening talk was given by José Carlos Príncipe (USA) on Information Theoretic Learning. On the second day of the workshop, Jake K. Aggarwal addressed the topic of Human Activity Recognition - A Grand Challenge.

A volume with the papers of the PRIS2005 workshop was edited by Hugo Gamboa and Ana Fred in the ICINCO-PRESS.

Next year's workshop will be presented in conjunction with ICEIS2006 in Paphos, Cyprus, 22-23 of May 2006 Please follow the information at the ICEIS website: *www.iceis.org*.

Workshop Report: IbPRIA 2005

General Co-Chairs:
Jorge Marques and Nicolás Pérez de la Blanca

2nd Iberian Conference on Pattern Recognition and Image Analysis

7-9 June 2005, Estoril, Portugal

Report prepared by Jorge Marques and Nicolás Pérez de la Blanca

IbPRIA 2005 gathered together 180 researchers from 38 countries working in the areas of Pattern Recognition and Image Analysis. The conference was held at Estoril, Portugal, a nice village by the sea close to Lisbon.
IbPRIA 2005 is the second of a series of conferences jointly organized every two years by the Portuguese and Spanish Associations for Pattern Recognition (APRP and AERFAI) with the support of the International Association for Pattern Recognition (IAPR).

The conference was organized in a single track format with 30 oral presentations and 141 poster presentations, covering a large number of areas including video surveillance, face recognition, biometrics, object tracking, computer vision, medical imaging, natural language analysis and pattern recognition.

The presented papers were selected by an international program committee out of 292 full paper submissions . This resulted in a scientific program of very high quality, which allowed stimulating discussions among all the participants in a very active and friendly atmosphere. The conference proceedings were published by Springer Verlag in LNCS series (vol. 3522, 3523).

The program included three invited talks from leading experts in the fields. On the first day, Prof. David Lowe presented an excellent overview on "Image Matching and Recognition from Invariant Local Features" with a live demo showing the ability to recognize different types of objects and even members of the audience in different positions using low level features. The second invited talk was presented by Prof. Wiro Niessen who presented the state of the art in computer aided surgery entitled "Image guided interventions: The glass patient" showing impressive results from his own activity. Finally Prof. Isidore Rigoutsos presented a stimulating talk on recent advances in bioinformatics and the discovery of patterns in the human genetic code under the title of "Understanding biological systems with the help of pattern discovery methods".

The best paper award was selected by a jury led by Prof. Horst Bunke. The award was given to the paper "A Framework to Integrate Particle Filters for Robust Tracking in Non-stationary Environments" by F. Moreno-Noguer and A. Sanfeliu. The prize was delivered by the President of IAPR Prof. Walter Kropatsch during the conference diner.

The next edition of IbPRIA will be organized in Girona, Spain, in June 2007. We wish the organizers a successful event.

Of interest...

New Discussion Group

Simon Lucas Chair of TC 5 Benchmarking Software encourages IAPR members to participate in a new discussion group to promote better understanding of relevant topics

The web site is:
groups-beta.google.com/group/IAPR-TC5

IAPR TC5 exists to promote common standards in benchmarking and software across multiple pattern recognition domains where possible.

TC5 home page:
algoval.essex.ac.uk:8080/tc5/intro/default.jsp?op=1

Positions

PHD POSITIONS in Computer Vision in Europe.

DEADLINE: July 10, 2005

For information see:
visiontrain.inrialpes.fr/

POST-DOC POSITIONS at the
Institute for Systems and Robotics (ISR)-Lisbon

DEADLINE: July 11, 2005.

For information see:
www.isr.ist.utl.pt/~jasv/temaB

Publications

Dictionary of Computer Vision and Image Processing
Robert Fisher, Ken Dawson-Howe, Andrew Fitzgibbon, Craig Robertson, Emanuele Trucco
John Wiley and Sons, June 2005

For more details, a sample chapter and purchase details, see:

eu.wiley.com/WileyCDA/WileyTitle/productCd-0470015268.html

CALL FOR PAPERS

Biometrics: Progress and Directions
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)
Special Issue
May Issue of 2007

DEADLINE: December 1, 2005

For information see:
www.computer.org/portal/cms_docs_transactions/transactions/tpami/CFP/TPAMI_Biometrics_CFP_v2.pdf