

IAPR Newsletter

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October 2012

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The views expressed in this newsletter represent the personal views of the authors and not necessarily those of their host institutions or of the IAPR.

Calls for Papers

ISMM 2013

*11th International Symposium on
Mathematical Morphology*
Uppsala, Sweden
Deadline: December 9, 2012
May 27-29, 2013

MVA 2013

*13th IAPR International Conference on
Machine Vision Applications*
Kyoto, Japan
Deadline: December 14, 2012
May 21-23, 2013

PSL 2013

*2nd International Workshop on
Partially Supervised Learning*
Nanjing, China
Deadline: December 15, 2012
May 13-14, 2013

MCS 2013

*11th International Conference on
Multiple Classifier Systems*
Nanjing, China
Deadline: December 15, 2012
May 15-17, 2013

ICB 2013

6th IEEE/IAPR International Conference on Biometrics
Madrid, Spain
Deadline: December 15, 2012
June 4-7, 2013

ICDAR 2013

*12th International Conference on
Document Analysis and Recognition*
Washington, DC, USA
Deadline: February 1, 2013
August 25-28, 2013

GREC 2013

*10th IAPR International Workshop on
Graphics Recognition*
Bethlehem, PA, USA
Deadline: end of March, beginning of April 2013
August, 20-21, 2013

CAIP 2013

*15th International Conference on
Computer Analysis of Images and Patterns*
York, UK
Deadline: April 1, 2013
August 27-29, 2013

ACPR 2013

2nd IAPR Asian Conference on Pattern Recognition
Okinawa, Japan
Deadline: June 10, 2013
November 5-8, 2013

CIARP 2013

18th Iberoamerican Congress on Pattern Recognition
Havana, Cuba
Deadline: June 15, 2013
November 20-23, 2013

Call for Submissions

IAPR Newsletter

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

Contact the editor:

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Deadline: December 14, 2012

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FEATURE: Getting to know...George Nagy,IAPR Fellow

A Self-serving Review of My Own Work

By [George Nagy](#), IAPR Fellow (USA)

Professor George Nagy, IAPR Fellow

ICPR 1998, Brisbane, Australia

*For contributions to document image analysis
and for service to IAPR*

I am a student, teacher, reviewer, referee, and critic, and lucky enough to have had half-a-dozen persistent ideas. I don't consider these ideas original, because any idea can be traced to a precedent. I just took custody of these notions and nursed them along till they could stand on their own feet.

In spite of many diversions, I keep returning to two intertwined strands. The first is adaptation. I hesitate to call it unsupervised learning, because all learning requires some external information. It need not, however, be a labeled training set! The second strand is judicious use of human interaction. Learning here cuts both ways: the machine can learn from us, and we can learn from the machine. For five decades I have sought to incorporate these notions into engineering solutions in various problem domains.

I have been less active in organizing conferences than many of my colleagues. This I attribute to a traumatic organizational experience nearly fifty years ago, at the very first workshop on Pattern Recognition, which was chaired by Al Hoagland, my boss's boss at the IBM TJ Watson Research Center. He let me help in inviting participants and setting up the program, and then sent me down to Puerto Rico three days early to make sure that everything was ready.

George Nagy graduated from McGill University in Engineering Physics (fencing and chess). He earned his MS at McGill by solving Euler's Second Equation for the hysteresis motor. He was awarded the PhD at Cornell University in 1962 for helping Frank Rosenblatt build Tobermory, a sixteen-foot, four-layer neural network for speech recognition. After a short postdoc, he worked on character recognition and remote sensing at IBM, Yorktown (and claims credit for IBM's growth during this period). During a reverse sabbatical at the Université de Montréal he recorded pulse trains from cats' medial geniculate nuclei. In 1972, he was appointed chairman of the Department of Computer Science at the University of Nebraska where he dabbled in computational geometry, GIS, and HCI, and was eventually inducted in the [NHC](#). From 1985 until his retirement in 2011, he was Professor of Computer Engineering at RPI in Troy, NY. Nagy's credits in document analysis include Chinese character recognition with [Dick Casey](#), "self-corrective" character recognition with Glen Shelton (with a reprise twenty-eight years later with [Henry Baird](#)), character recognition via cipher substitution with Casey, [Sharad Seth](#), and [Tin Ho](#), growing X-Y trees with Seth, table interpretation with [Dave Embley](#), [Mukkai Krishnamoorthy](#), [Dan Lopresti](#), and Seth, modeling random-phase noise with [Prateek Sarkar](#) and Lopresti, style-constrained classification with Sarkar, [Harsha Veeramachaneni](#), [Hiromichi Fujisawa](#), and [Cheng-Lin Liu](#), and paper-based election systems research with Lopresti and [Elisa Barney Smith](#). He tries to keep up with the state of the art by learning new ideas from former students. He is a Fellow of the IEEE and the IAPR, and received prematurely (in 2001) the ICDAR Lifetime Contributions Award. In his spare time Nagy enjoys skiing, sailing, and writing prolix surveys. Since his retirement from RPI in June, 2011, he enjoys having more time for family, friends, writing programs, reading (too often, patents), and septuagenarian outdoor activities.

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When I arrived, the magnificent El Conquistador hotel, overlooking the cliff at the tip of the Island in Fajardo, was being expanded. The Swiss hotel manager allayed my concern about the pneumatic drills reverberating through the meeting rooms and assured me repeatedly that all construction work will stop when the workshop began. He also sent baskets of fruit and cognac to our room every night.

The construction did not stop: the danger of forsaking the on-time completion performance bond was too high. During the first morning session, I was asked to find an alternate venue, charter buses, procure sandwiches, and resettle the entire workshop at lunchtime. I did, and the second session took place, only one hour behind schedule, at the El Dorado 50 miles away.

During the next months I helped transcribe the conference talks from reel-to-reel tape. Laveen Kanal edited and published them under the title *Pattern Recognition* (Thompson 1968). My own report, "A Happening in Puerto Rico," appeared in *Computer Group News* (that eventually morphed into *Computer*) and in *Spectrum*. Azriel Rosenfeld gave me some excellent suggestions, and I received many complements for my summary. Nevertheless this episode left me skittish about local arrangements chair honors, and I was glad to return to my research in Yorktown.

My first assignment was Chinese character recognition to feed a translation program for the Air Force. Working with Dick Casey, whom I met while we were being "processed" by IBM Personnel, made hierarchical classification of 1000 classes of ideographs joyful and exciting. We had a chance to review progress on subsequent developments after 25 years at *ICPR 1988*, but most of the Chinese OCR experts stayed away because the conference

was moved on short notice from Beijing to the outskirts of Rome.

The next project suggested by our insightful boss Glenn Shelton, self-corrective character recognition, had an even more lasting impact. The idea was simple but counterintuitive. We assigned alphanumeric labels to a set of printed characters from the same source using a garden-variety classifier. This naïve classifier got many of the labels wrong. Nevertheless, we pretended that all the labels were correct, used them to design a new classifier, and then had the new classifier reclassify all the patterns. The resulting error rate was lower than the original error rate, and it kept decreasing during additional iterations of the classify-redesign cycle.

Nearly thirty years later, the idea caught Henry Baird's attention. He offered to replicate it with his own classifier, and on his huge, one-hundred-font data set. The experiments again demonstrated that the classifier lifted itself by its own bootstraps. Still later, Yihong Xu demonstrated that adaptation could reduce the size of the training set required to recognize degraded and touching print.

The matter rested there until two of my students, Prateek Sarkar and Harsha Veeramachaneni brought their insight and formidable mathematical skills to bear on it. Prateek defined style consistency as the statistical dependence between features (not labels!) in a field of isogenous patterns. As opposed to font recognition, the optimal style-constrained classifier never identifies the underlying style but exploits the fact that the appearance of a 6 in a given style gives some information about the appearance of a 9 in the same style. Prateek modeled classes and styles by weighted multi-modal feature distributions, applied

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the EM algorithm to style-unsupervised training, and found a computable approximation for the most likely field class.

Harsha proposed to classify fields of isogenous patterns with a style-conscious quadratic discriminant field classifier. He showed that the covariance matrix of a field of any length can be computed from a composition of pairwise cross-covariance matrices and optimized his classifier for singlet-error or field-error. He investigated order independence that distinguishes style from language context, intra-class style, inter-class style, and the effect of field length on error rate.

Xiaoli Zhang, my last PhD student, explored the nature of style consistency in high-dimensional feature spaces. Prateek and Harsha demonstrated the benefits of style classifiers with an informative series of experiments on simulated patterns, on printed digits, and on NIST handprinted digits. I learned a great deal from them, and keep learning more as they keep coming up with truly interesting ideas. On a recent visit to Beijing, I was glad to see that Cheng-Lin Liu – who participated in this work while at Hitachi Central Research – and his students at the Beijing Institute of Automation are integrating style-conscious classification with segmentation, geometric context and language context for handwritten Chinese text.

Contrapuntal to the idea of shape context is recognizing scanned printed text without any preconception whatever of the shape of the characters. Dick Casey and I proposed to cluster feature vectors, represent the text by the sequence of arbitrary cluster labels, and decode the resulting substitution cipher (the Romans could already crack such ciphers). One problem that we had to solve was stopping the cluster merge/divide process at the natural number of clusters. Another

that later became important in building language models was the estimation of rare bigram frequencies (we modified Laplace's Law of Succession). It all worked like a charm, so we published it in *IEEE Trans. Comp* in 1968.

A decade later, when there was enough memory to store a dictionary of a few hundred common words, Sharad Seth, Kent Einspahr, and I developed more elegant methods that could solve the puzzle with only a few lines of upper and lower case scanned text. At ICPR 2000, Tin Ho and I presented "OCR with no shape training" on Spitz glyphs that befuddle human readers. So our "Autonomous Reading Machine" had a long run.

There was one more invention in those early years, suggested by Peter Welch, that resurfaced later. That was the notion of symbol-based compression of text images. We could not patent it because of an on-going anti-trust suit, so IBM did not let us publish it until 1974. I received many inquiries about it twenty-five years later when DjVu adopted a variant of the method (as did, still later, JBIG2). We had, however, missed a critical point. The prototype that took the place of the current letter always looked right, but nevertheless the method was not lossless. Subsequent researchers encoded the difference between the current glyph and its prototype.

In 1968 I spent a reverse sabbatical at the Université de Montréal, half time in Informatique teaching pattern recognition and half-time in Neurophysiologie. I poked micro-electrodes into the lateral geniculate nucleus of cats to find an aural equivalent to Hubel's and Wiesel's Nobel prize-winning discovery of the organization of the visual cortex. I did not, but had my first wonderful graduate student, Kamal Abdali. He recently told

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me that the problem that I had set for him, optimal feature selection, was eventually proved NP-complete.

Whenever I ran out of ideas, I read voraciously and wrote surveys about whatever I read. My first one was mostly the lit review from my dissertation on analog memory systems for neural networks. The next one, "State of the Art in Pattern Recognition," was based on my preparation for Don Nelson's invitation to give some lectures on pattern recognition to his staff of the computing center of the University of Nebraska (UNL). It won a Citation Classic award.

Towards the end of my stay at IBM Research, I was asked to help define the Landsat missions, so I wrote a survey about remote sensing. After I moved to UNL, I wrote lengthy reviews on geographic data processing (later GIS) with Sharad Wagle, on image registration with Bill Brogan, on text editors with Dave Embley, on optical scanners, and on OCR.

At UNL I also guided some student research. In 1975, Gregory Harambopoulos analyzed a whole year's worth of log tapes for the university's mainframe computer. The most cycle-intensive customer was the Chemistry Department. We discovered that more than 10% of all jobs failed because of JCL (Job Control Language) errors. The timing was lucky, because the proliferation minicomputers ended the possibility of observing an entire university's computing activities from a single vantage point. Our paper won a prize at a computer performance analysis conference, and Gregory made a career in performance evaluation with the federal government.

MS student Anandan, Dave Embley, and I applied file comparison methods to study student

programming errors. (Thirty years later, Anandan and I were inducted together into the [UNL Hall of Computing](#). Imagine!)

Sharad Seth and I introduced X-Y trees at *ICPR 1984*. Researchers are still adapting them to applications far beyond what we had in mind (see [Getting to Know...Andreas Dengel, IAPR Fellow](#) in this issue). During a summer break at IBM San Jose, Dick Casey, and I devised a probabilistic method of decision tree design that made its way into commercial OCR products.

Through Herb Freeman I linked up with Massimo Ancona, Leila De Floriani, Bianca Falcidiano, and Caterina Pienovi in Genoa. We exchanged visits (often with our students) and worked on triangulating topographic data, on terrain visibility, and on 3-D boundary models. This mix of topics triggered the conjecture that the triangles in any Delaunay tessellation could be ordered by geometric visibility. Finding a proof for this new theorem of planar Euclidian Geometry took us almost a year. Within a few months, Herbert Edelsbrunner generalized it to N dimensions.

After I moved to Rensselaer Polytechnic Institute (RPI), I continued to write surveys until I could reestablish my research. A lengthy treatise on OCR with Sharad Seth had to be re-titled "*Modern Optical Character Recognition*," because the M volume of the *Encyclopedia of Telecommunications* was about to go to press. I wrote one about the history of neural networks, mainly because the 1990 International NN Conference was held in Paris. Dick Casey and I enjoyed another trip to France when we were invited to give a tandem survey of document analysis at the first ICDAR. Later I surveyed the frontiers of OCR and terrain visibility. Another

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review, “Twenty Years of Digital Image Analysis in *PAMI*,” has already garnered more citations than my 1968 “State of the Art...”, but I attribute that only to citation inflation. Dan, Dave, Sharad, Matthew Hurst, and I merged our references on table processing for *IJDAR*. Harsha and I contributed a survey to Simone Marinai and Hiromichi Fujisawa’s fine book on *Machine Learning in Document Analysis and Recognition*. I never expected that I would get so much mileage out of my three-week McGill summer course on surveying!

RPI DocLab was also Randolph Franklin’s Computational Geometry Lab. Maharaj Mukherjee (the second of my three consecutive PhD students from IIT Kharagpur and now a master inventor at IBM) and my former UNL student Shashank Mehta (now Professor at IIT Kanpur) used continuing fractions to find the best integer coefficient representation of geometric points and lines of intersection that are naturally calculated as floating point numbers. Maharaj was inspired by David Dobkin’s pentagon problem, but that turned out to be too hard.

We made some (small) waves in 1992 with a 2-D page-grammar-driven layout analysis for technical journals. Sharad, my RPI colleague Krishnamoorthy, and I just looked over the shoulders of PhD candidate Mahesh Viswanathan, who did all the work. Since then Mahesh has risen to Chief Cloud Architect and Master Inventor at IBM and no longer seems to fear us.

Tom Nartker invited me to spend parts of three summers at his Information Science Research Institute in Las Vegas with Steve Rice and my former student Junichi Kanai (now my colleague at RPI). Between expeditions to the twisting canyons surrounding the City of Sin, we devised evaluation

methods for many different facets of OCR and layout analysis. The tests conducted by ISRI on commercial systems may still represent the best publicly available information on OCR accuracy on a variety of document types. The striking differences exhibited by OCR engines on the same scanned pages inspired Steve to create a coffee table book of error “snippets.” He enlisted Tom and me as co-authors, and Kluwer published it in 1999.

Dan Lopresti and I met at a DAIR conference in Las Vegas where we presented back-to-back papers on the validation of image defect models. With some help from Andrew Tompkins, we combined our ideas in a *PAMI* article. Since then we have collaborated on dozens of papers on table recognition and on mark-sense election technologies. Some of the table work was conducted with Sharad and Moorthy in the framework of Dave Embley’s long-lived TANGO (table ontologies) project, while my former student Elisa Barney Smith (now Associate Prof at BSU) contributed heavily to the ballot image processing. We also combined forces with Prateek and Jiangying Zhou for a formal analysis of the ever-present noise due to the random position of the spatial sampling grid relative to a scanned document. More recently, Dan and I have coauthored a series of white papers on prospects in DIA.

Let me return briefly to my interest in HCI (human computer interaction). It languished for quite a while because most of my students were so algorithmically inclined. Eventually, however, I persuaded an initially skeptical Jie Zou to develop an interactive classification system for his dissertation. Jie designed a user-friendly GUI and demonstrated that routine correction of errors can improve recognition on new data with minimal

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initial training. The human also learns from the system. Jie constructed CAVIAR (Computer Assisted Visual Interactive Recognition) systems for wildflowers and for face recognition. Among the best parts of the project was photographing the flowers *in situ*. Jie subsequently ported the interface to the web, so that it could be used with mobile devices. Sharad, Dave, and Dan liked the CAVIAR idea, so we are now applying it to tables (VeriClick), cervigrams (Cervitor), and calligraphy (CalliGUI). Perhaps the time has finally come for systems that improve with use!

Occasionally I am asked what is the best thing that I have ever written. My private hope is that I have not yet written my best, but I usually offer “Candide’s Practical Principles of Experimental Pattern Recognition” (in *PAMI 1983*) because it is less than two pages and has no references. The editors did ask me for references, but I refused for fear of retribution for whistle blowing. I consider six of my articles tied for *worst* paper.

Only once have I ever written anything that I deemed poetic: “The Dimensions of Shape and Form.” I presented it at a delightful conference in Capri organized by my faithful Neapolitan friends Luigi Cordella, Carlo Arcelli, and Gabriella Sanniti di Baja. They kindly included it in their *Visual Form* (Plenum, 1991), but either it did not scan right, or poetry is not appreciated in our circles.

Research projects with my children rank high among my most pleasurable experiences. My students and I collaborated on restoring diacritics and on clustering dialects with my daughter, and on quantifying crack-propagation in concrete with my son. In spite of any gripes that they may have overheard, both opted for university teaching careers.

These days I am often invited to give retro talks. I talked about OCR test data since the fifties at *DAS 2010*, about computer science research in the seventies at UNL, about Frank Rosenblatt’s perceptrons at Pace University. IAPR’s TC-1 has entrusted me with the bitter-sweet task of delivering the [Pierre Devijver Award Lecture](#) at [S+SSPR 2012](#). Recently ABBYY offered to digitize, OCR, and index 19 bankers’ boxes of my OCR and DIA memorabilia. These cannot be posted on the web because of copyright issues, but I will make the searchable PDF files available to the IAPR community.

Now that I have time, I enjoy programming again – in M-code and Python. It is so much easier to run a large experiment these days. My only new project, on Chinese calligraphy, was initiated last year when Shanghai Professor Xiafen Zhang visited DocLab for six months.

There is no question that I have had a privileged life. My wife and I still enjoy breakfast and dinner together after 48 years. We look forward (and backward) to holidays with our children and their sig-others. I have kept some friends from those 19 years between Grade 1 and PhD. From time to time Dick Casey and I find a day for wide ranging discussion. When Hiromichi Fujisawa’s international standards-chair schedule permits, we walk and talk. There are always one or two papers on the burner with my staunch collaborators Sharad, Dave, Dan, and Moorthy, or with one of my ex-students. Most of my wonderful graduate students keep in touch. Several parents, partners, children, and children’s partners have also become part of our circle. Thank you all!



Getting to know...Andreas Dengel, IAPR Fellow

By [Andreas Dengel](#), IAPR Fellow (Germany)

Prof. Dr. Andreas Dengel , IAPR Fellow

ICPR 2004, Cambridge, UK

*For contributions to document understanding
and for service to IAPR.*

After finishing my studies of Computer Science and Economics at the University of Kaiserslautern in 1986, I started working at Siemens Labs in Munich, Germany, where I did research on Geometric Reasoning and Pattern Recognition. Following my first successful publications at IJCAI and ICPR, I received an offer as a lecturer and research assistant at the Computer Science faculty of the University of Stuttgart where I finished my PhD in February, 1989.

During my early years, in March, 1989, I met Horst Bunke in Boston and Cambridge, MA, where I gave a talk at MIT. Horst told me about the SSPR 90 workshop held in Murray Hill, NJ, organized by Henry Baird and Larry O’Gorman and the idea of bringing together everyone who worked in the field of Document Analysis and Recognition. For me it was an absolute must, and finally I was able to successfully submit a paper. Today, I can say that SSPR 90 was a kind of key event for me: I was not only inspired by the atmosphere and the constructive discussions but was also able to get networked to many distinguished community members. In this way, I got in touch with all those senior people who were involved in the early planning and the setting-up of the ICDAR conference series. To my surprise, I was invited to become a PC member of the first

Andreas Dengel is the Managing Scientific Director at the German Research Center for Artificial Intelligence (DFKI GmbH) in Kaiserslautern. In 1993, he became a Professor at the Computer Science Department of the University of Kaiserslautern where he holds the chair “Knowledge-Based Systems”, and since 2009, he is appointed Professor (Kyakuin) at the Department of Computer Science and Information Systems at the Osaka Prefecture University. He received his Diploma in CS from the University of Kaiserslautern and his PhD from the University of Stuttgart. He also worked at IBM, Siemens, and Xerox Parc. Andreas is member of several international advisory boards, has chaired major international conferences, and has founded several successful start-up companies. Moreover, he is co-editor of international computer science journals and has written or edited 11 books. He is author of more than 180 peer-reviewed scientific publications and has supervised more than 240 PhD and master theses. Andreas is an IAPR Fellow and has received prominent international awards. His main scientific emphasis is in the areas of Document Understanding, Information Retrieval, Multimedia Mining, Social Media, Semantic Technologies, and Agile Knowledge Workflows.

ICDAR, which took place in Saint-Malo, France, and of all other ICDARs that followed.

When coming back to Germany from a temporary, post-doctoral position at PARC, I started working at

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the German Research Center for Artificial Intelligence (DFKI) and set-up my own small group that focused on various topics of document analysis and recognition. In 1993, I was invited by Kazuhiko Yamamoto and Yasuaki Nakano to give a keynote talk at ICDAR 1993, my first of three keynotes at ICDAR conferences. In the same year I was appointed professor at the University of Kaiserslautern and took over the job as a Scientific Director at DFKI. This provided the opportunity to work on Document Analysis and Recognition within an excellent and well-staffed institution.

Taking the basic idea of SSPR90, Henry Baird, Larry Spitz, and myself decided to run a new but special IAPR biannual workshop on Document Analysis Systems (DAS), which was to take into consideration the increasing demand from the market on such technologies. As a consequence, the first DAS took place in my hometown, Kaiserslautern, Germany, in 1994. At the same time, my group at DFKI concentrated more and more on the combination of Knowledge-Based and Pattern Recognition Methods for understanding the contents of various kinds of office documents. The aim of our research was to extract all workflow-relevant bits of information and route them to post-processing applications. This research addressed a new field and required new approaches. Building on George Nagy's early publications on X-Y Trees (see [Getting to Know...George Nagy, IAPR Fellow](#) in this issue), my group and I could develop very promising techniques for document understanding and information extraction. At the same time and together with Jürgen Schürmann, one of the pioneers in Character Recognition, we succeeded in hosting ICDAR 97 in Ulm, Germany, and I acted as a Program Chair. During this conference IAPR introduced the ICDAR Young Investigator Award, which I was honored to receive together with J.J. Hull. In Ulm, we started to discuss ideas to run our

own journal, the [IJ DAR](#), published by Springer, that would further help to foster collaboration and the exchange of ideas within our community. I was an editor right from the beginning, which was a great honor for me. The first issues started in 1998.

During these years, my group at DFKI rapidly grew, with a broad range of international publications as well as several very successful industrial projects. This led to my first spin-off company built on our Document Analysis and Recognition technology workbench. This was in 1999. Today, Insiders Technologies is well established with more than a hundred employees and installations all over the world.

In the meantime, ICDAR became a major event for the whole community. Successful conferences in Tsukuba City, Montreal, and Bangalore followed Saint-Malo, until we all met again in September 2001 in Seattle. It was a special ICDAR, but not only because of 9-11 that happened during the conference and overshadowed everything, but this event revealed that such a large conference needed a forum for continuous monitoring and for providing appropriate advice for planning, organizing, and running coming ICDAR conferences. This was the birth of the ICDAR Advisory Board to which TC10 and TC11 chairs and one or two senior people would belong. I was elected to join, and today, I am still a (the longest-serving) member.

In 2004, I ran another DAS as a Co-Chair together with Simone Marinai in Florence, and for the first time, we had more than one hundred participants. At ICPR in Cambridge, UK, I was elected an IAPR Fellow for my contributions to document understanding and for service to IAPR. One year later, I founded another start-up, again on

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Document Analysis, and received the Pioneer Spirit Award, a prize for the high quality of the underlying technological and founding concept. In 2006, we had another DAS in Nelson, New Zealand, chaired by Larry Spitz and Horst Bunke. When Larry Spitz decided to retire that year, I took over his role as a spokesman of the DAS Steering Committee. In the fall of the same year, I acted as a Track Chair at ICPR in Hong Kong. In 2007, Yasuaki Nakano, one of our distinguished Japanese colleagues and honorary chair of DAS 2008, became seriously ill. Unfortunately he didn't recover and died of cancer. In memory of him, IAPR announced the Nakano Award for the best paper at DAS workshops. I was deeply moved when Nakano-sensei's widow handed the first Nakano Award to my student Georg Buscher and me at DAS 2008 in Nara.

Over the years, I have not only established research alliances but also strong personal relations to Japan. Among the many ties, I have to mention Koichi Kise, who was a visiting researcher at DFKI for 15 months at the turn of the millennium. It was also him with whom I founded the Institute on Document Analysis and Knowledge Science (IDAKS) at the Osaka Prefecture University (OPU) in 2008. Based on my frequent visits to OPU and

the close collaborations with jointly supervised theses and continuous exchange, in 2009, I was highly honored to become the first non-Japanese to be appointed a Kyakuin (Honorary Professor) at OPU, which made me very proud.

Today, I am a member of the management board of DFKI, the world's largest AI institute with more than 800 employees, an exciting place with exciting people, and one of the best places I can think of to do research. In all these years, my work was always been dedicated to knowledge-based and cognitive aspects on pattern recognition with a strong focus on applications, especially on documents. Beside the traditional fields, I am currently experimenting a lot with perception and eye tracking in order to determine attention. For those who are interested, please see Text 2.0 (<http://text20.net/>).

There are, God willing, still some fifteen years left in my professional life. This year, I am involved in organizing [ICPR 2012](#) in Tsukuba, Japan as a Tutorial Chair and in [ICFHR](#) in Bari as a Program Co-Chair. I am quite sure that there will be a whole bunch of new, exciting contributions that I can make to our Pattern Recognition society in the future.



News from the IAPR EXECUTIVE COMMITTEE

by Ingela Nyström (Sweden)

Uppsala September 30, 2012

The IAPR community is in the final preparations for presentations and meetings to be held at the 21st International Conference on Pattern Recognition (ICPR) in Tsukuba, Japan, on November 11-15, 2012. The ICPR conference series is IAPR's main event. Please, visit the ICPR 2012 web site www.icpr2012.org for information.

In the previous IAPR Newsletter, we announced that the recipient of the King-Sun Fu Prize, the most prestigious IAPR award, in 2012 is Professor Rama Chellappa, University of Maryland, USA. Now it is our pleasure to announce that the recipient of the J. K. Aggarwal Prize in 2012 is Professor René Vidal, Johns Hopkins University, USA. Both prizes are to be awarded at the ICPR 2012.

In this edition of the IAPR Newsletter, we are getting to know two IAPR Fellows: Professor George Nagy and Professor Andreas Dengel. Interestingly enough, their presentations connect since Dengel has built some of his research on the successful X-Y-trees that Nagy introduced.

As usual, we can also read a number of conference and book reports thanks to our editors. I would like to take this opportunity of thanking especially Alexandra Branzan Albu, our IAPR Newsletter Editor-in-Chief, who now will resign from this position. We thank Alexandra for bringing quality and diversity to the *Newsletter* during the past four years.

This is the last "From the ExCo" column written by the outgoing Executive Committee. It has been a pleasure and an honour for us to serve the IAPR community these last two years. We wish all the best to the new committee, which will be elected at the Governing Board meeting on November 13.

Safe journeys to Tsukuba in November! For colleagues who will not attend ICPR 2012, I hope to see you at the next ICPR, which will be in Stockholm in August 2014!



BOOKSBOOKSBOOKS

Pattern Recognition, Machine Intelligence, and Biometrics

by Patrick S. P. Wang, Editor

Springer, 2011

Reviewed by [Leon Todoran](#) (The Netherlands)

This book is a collection of 31 scientific papers organized in four main sections: “Pattern recognition and Machine Intelligence”, “Computer Vision and Image Processing”, “Face Recognition and Forensics” and “Biometrics Authentication”. These chapters cover a broad domain making the book appealing to a large group of specialists. The difficulty ranges from beginner to advanced through the chapters of the book. There are simple introductory overview chapters but also chapters with solid theoretical support and extensive experimental results.

In the first part, to get a basic introduction to evolutionary algorithms, we recommend the first chapter. Chapter 4 is a good paper for anyone interested in image fusion. Chapter 5 is an interesting application of pattern recognition to the wireless sensor selection problem.

In the second part, the reader (recommended for students) could find a fascinating article on human extremity detection in Chapter 10, an introduction to ensemble learning in Chapter 11, and an image rendering system based on depth information in Chapter 12.

The third part “Face recognition and Forensics” starts with an intriguing experiment on gender and race identification, using 3D data. You have to read also the comparison of computer versus human classification. If you are interested in face recognition you should certainly not miss Chapter

14. It is a well written article covering existing methods. There is a good short overview of existing methods, a theoretical proof of their method and impressive experimental results. Chapter 18 has another very good paper on face recognition. This is a comprehensive overview with good theoretical background and experimental comparisons. For those interested in fingerprints, Chapter 17 gives an extensive overview of state-of-the-art methods for fingerprint identification. Chapter 22 presents a method for detection of image forgery and hidden content in JPEG images and wave files.

The fourth part has nine chapters on aspects of biometric identification. An overview of biometric authentication systems is given in Chapters 23 and 28. Chapter 24 presents a method for online handwritten Chinese characters recognition. Automatic signature verification is discussed in Chapters 26, 30 and 31. A good overview on iris recognition is given in Chapter 28.

As a collection of independent articles written by various authors, there is some repetition of topics in the book. The disadvantage of this is that many introductions and short reviews refer to the same field. On the other hand, this is also an advantage: one can see different views on the same algorithms and different interpretations of similar results.

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A future edition of the book could consider removing some of the chapters (i.e., 7, 8, 23, and 29), correcting the English errors, and printing result graphs in color to improve readability.

We give a more detailed review per chapter below:

Part I “Pattern recognition and Machine Intelligence”

1. A Review of Applications of Evolutionary Algorithms in Pattern Recognition

This chapter is a review of evolutionary algorithms applied to pattern recognition. It gives a good introduction to evolutionary algorithms. Firstly, evolutionary algorithms are exemplified on k-means clustering and ellipse fitting problems. Then the use of EA is exemplified in all three aspects of pattern recognition: segmentation, feature selection, and classification.

This chapter gives the reader a good insight into evolutionary algorithms, advocating for their advantages in pattern recognition problems. For more detailed information, the reader is presented with an extensive list of references.

2. Pattern Discovery and Recognition in Sequences

This chapter begins by presenting a brief review of the challenging task of pattern discovery with applications from natural language processing to DNA analysis. Then the authors introduce their pattern discovery framework.

3. A Hybrid Method of Tone Assessment for Mandarin CALL System

This chapter describes a new method for spoken language tone assessments. Since language tone

is more important in Mandarin than it is in European languages, their system implements tone recognition for Mandarin.

4. Fusion with Infrared Images for an Improved Performance and Perception

This chapter reviews existing methods for image fusion at three different levels: pixel, feature, and decision. The review is specifically oriented for fusion of infrared-images with visible light images. Some applications of image fusion are presented at the end.

5. Feature selection and ranking for pattern classification in wireless sensor networks

In this chapter feature selection is applied to a specific problem. In order to reduce the power consumption and the lifetime of a network of wireless sensors, the number of sensors should be reduced. Here they use a k-nearest neighbor classifier to select the features (sensors). Their proposed system was implemented and tested for accuracy and lifetime in a set of five experiments.

6. Principles and applications of RIDED-2D – a robust edge detection method in range images

This chapter presents a computationally efficient edge detection method from range images. The range line image is filtered first for noise, and then edges are detected with a rule based algorithm. Integrating the denoising and edge detection in one algorithm, they obtain an efficient system able to process one scan line in 0.1 milliseconds with over 98% accuracy.

PART II. Computer Vision and Image Processing

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7. Lens Shading Correction for Dirt Detection

This article presents a method for automatic lens dirt detection on inexpensive camera modules.

8. Using Prototype-Based Classification for Automatic Knowledge Acquisition

This is a “trial and error” method to group some data. There is no learning or generalization power. They apply this to mitochondrial movement classification.

9. Tracking Deformable Objects With Evolving Templates for Real-Time Machine Vision

The paper addresses the most important issues of object tracking: real-time performance, matching, template updating, occlusion, and multiple objects tracking by using a contour-based tracking approach. Their A* search method is about 4 times faster than blind search template matching while providing the same accuracy.

10. Human Extremity Detection for Action Recognition

This chapter proposes an approximation for human action recognition. Instead of tracking all internal body joints, they show that positions of body extremities alone are enough for an excellent approximation of body motion. Since the inner joints are more difficult to automatically detect from video, without special markers, this method is an important step forward towards automatic human action recognition. They use either contour or image patches to find extremities. On the two public datasets: Weizmann and Tower, they get 93.6% and 86.7% accuracy, respectively. Tower data set is more difficult since the humans have a strong shadow and image resolution is quite low.

Compared to the precise extremities method, their probable extremities method gets better results: 95.7% on Weizmann and 98.3% on Tower data.

11. Ensemble Learning for Object Recognition and Tracking

This chapter is a review of complex classification methods consisting of a set of simple classifiers. This decomposition is called ensemble learning. Different classifiers can be generated by different initializations, different training sets, or different classifiers trained over same feature set and training data. Two main classes of ensemble learning are discussed here, the random subspace method and the boosting method. They are exemplified on face recognition and object tracking, respectively.

12. Depth Image Based Rendering

This chapter presents a method for automatic image rendering based on depth information from video images. The human brain generates depth information from images captured by two eyes. This chapter introduces a method that generates the second image feed from a 2D video and depth information. Rendering issues are tackled here: disocclusion, imperfect depth maps, ghosting, and cardboard effect. They propose a new standard for 3D video representation: “video -plus- depth” (instead of current system “video-plus-video”) with advantages of a smaller data rate and the possibility to represent more views with adaptable rendering parameters.

Part III: Face Recognition and Forensics

13. Gender and Race Identification by Man and Machine

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This chapter presents an interesting experiment on gender and race identification. They use an existing 3D face dataset with accompanied ground-truth and standard classification methods. Their goal is to prove experimentally that profile contour and the color information makes a difference in gender and race identification. They also compare computer results with classifications made by a group of human subjects. They use shape matching for profile contour and SVM for frontal face classification. They conclude that the profile contour of a face can be used as a cue for gender and race identification, although the classification results are poor. Color provides very little information and therefore it is not recommended to be used for gender and race identification. Surprisingly, humans could not identify the gender and race without error, and furthermore the computer outperforms humans on this classification.

14. Common Vector Based Face Recognition Algorithm

This chapter starts with a well-written, short review of existing methods for face recognition. Then theoretical proof of their new method for face recognition based on common vector is presented. They show impressive experimental results compared to standard methods of PCA, KPCA and LDA. For instance, on the FERET database, their recognition rate is 71.9% versus 42.3% obtained by PCA.

15. A Look at Eye Detection for Unconstrained Environments

Here are presented two methods for precise eye detection in unconstrained images. One is based on PCA and learning; the other one is based on filter correlation using Fourier transform. They

compare their methods to a leading commercial application on images captured in low light conditions, blurred images, and low resolution images. In all these cases, their method outperforms the commercial application.

16. Kernel Methods for Facial Image Preprocessing

In this chapter are shown impressive results of kernel PCA applied to preprocessing of face images. In particular, outstanding results are shown on image denoising, occlusion recovery, illumination normalization, and facial expression normalization. Kernel methods are normally used in classification, this chapter shows their strength in the less tackled domain of image preprocessing.

17. Fingerprint Identification – Ideas, Influences, and Trends of New Age

Here is an extensive review of state-of-the-art methods for fingerprint identification. Almost 200 papers on fingerprints are reviewed here. They track the first use of fingerprints back to 1684. Then major fingerprint publications from the last 20 years are synthesized in a good fingerprint identification presentation. Several methods from the literature of preprocessing, minutiae extraction, and texture-based feature extraction are described here briefly. At the end of this review the authors identify a few open problems in fingerprint identification: better accuracy, identification in low quality images, detection from overlapped fingerprint images, and identification speed in large databases.

18. Subspaces Versus Submanifolds – A Comparative Study of Face Recognition

This is a theoretical and experimental comparison

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of subspaces versus submanifolds methods used in face recognition. First, a brief review of subspace based face recognition algorithms is given: PCA and LDA. Then, submanifold based algorithms for face recognition are discussed. Four main groups of manifold learning algorithms are identified: global methods, global alignment of local models, local methods, and extensions. Out of each group, several representative methods are presented briefly. At the end, experiments are performed on the CMU-PIE and FERET face databases. Very valuable analysis of results and conclusions make this chapter one of our favorites.

19. Linear and Nonlinear Feature Extraction for Face Recognition

This chapter discusses the limitations of linear methods for face recognition: dimensionality problem, small sample size problem, and nonlinear problem. After a short presentation of classical methods (PCA, LDA, Fisherface, and direct LDA), they introduce the theoretical base of a new method for regularized LDA called here 2SRDA. They test 2SRDA against Fisherface, DLDA, and Huang's method on the ORL and FERET databases. 2SRDA has better recognition rates than other methods and it also has a smaller computational complexity.

Since variations of pose and illumination are too difficult for linear classifiers, they present further a kernel method based on Mercer kernel theory. Experimental results show its robustness on pose and illumination variations on the FERET and CMU-PIE datasets.

20. Facial Occlusion Reconstruction Using Direct Combined Model

Here is presented a new method for reconstructing

the partially occluded face image. After a brief review of existing methods, the authors introduce their Direct Combined Model (DCM), which basically combines the shape and texture into one Eigen space in order to maximize their covariance. Then a DCM transform is derived from the learned combined model. Their experiments on a face dataset manually labeled and manually occluded shows similar results to other existing methods, while DCM is more robust and can handle larger occlusion areas.

21. Generative Models and Probability Evaluation for Forensic Evidence

This chapter describes a generative model with applications in forensics. Defined here are three metrics based on the probability of random correspondence. These three metrics are applied to several modalities: birthdays, human heights, and fingerprints using ridge flow and minutiae. The fingerprint minutiae are modeled as mixtures of Gaussian and von Mises distributions. For evaluation they use the NIST special database 4. Their estimated probability is very close to the empirical results, concluding that generative model offers a reasonable and accurate fingerprint representation.

22. Feature Mining and Pattern Recognition in Multimedia Forensics – Detection of JPEG Image Based Steganography, Double-Compression, Interpolation and WAV Audio Based Steganography

After a short introduction and review of existing methods, this chapter presents a method for detection of steganography based on Markov analysis of the DCT coefficients. Their study shows that embedding of the secret information

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changes the neighboring joint distribution. They also show that Markov analysis alone is not enough to detect steganography properly.

For image forgery, they analyze the statistical properties of DCT coefficients to detect double compression and interpolation.

For steganalysis of audio files, they present a new derivative-based method exploiting the Mel-cepstrum coefficients and Markov transition features.

Experimental results on a set of 5000 images shows good results on detection of hidden data, double compression, and jpeg resampling. The audio steganalysis was tested on a set of over 25,000 audio sequences. Results indicate significant improvements over the previous methods.

PART IV BIOMETRIC AUTHENTICATION

23. Biometric Authentication

As an overview of biometrics methods, this is a good beginning of Part IV. Here are presented basic principles and operations of fingerprints, face, iris, voiceprint, and vein recognition systems. Here are also discussed issues of biometric standardization and certification.

24. Radical-Based Hybrid Statistical-Structural Approach for Online Handwritten Chinese Character Recognition

Here is presented a framework for handwritten Chinese character recognition. Many Chinese characters share common substructures called radicals. This method combines the statistical and structural approaches for radical-based character recognition. There are two main classes of

radicals: special and non-special. Binary classifiers, one for each class of special radical, are used for detection of special radicals. For non-special radicals (left-right, up-down, and single-element) detection they use two methods: sequential and hierarchical. The experimental results show that the independent modules of special and non-special radical recognition perform comparably to holistic character recognition. But the integrated radical-based, whole-character recognition is slightly lower than that of holistic recognition.

25. Current Trends in Multimodal Biometric System – Rank Level Fusion

This chapter is an overview of existing multimodal biometric systems and the current trends in multimodal biometric fusion. Multimodal biometric systems have the advantage of improved recognition accuracy over unimodal systems. One important issue in these systems is how to combine the extra information of individual systems, called fusion. There are two major classes of fusion methods: pre and post matching.

26. Off-line Signature Verification by Matching with 3D Reference Knowledge Image - From Research to Actual Application

This is one of the best chapters in this book. The authors review existing methods and introduce a method for off-line verification of signatures. In signature verification there are three types of images used: binary, thinned, and high pressure region images. From these images, several features are extracted to be used in classification: slopes, slants, horizontal and vertical projections, etc. 3D Reference Knowledge Image (3DRKI), which adds another dimension to the feature space, is introduced. This is simply built by

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superimposing the binary genuine samples centered on their gravity center. The third dimension is the number of occurrences of pixels from different samples. Global and local feature extraction is presented in details together with distance metrics. Experiments performed using 3DRKI with three image types show outstanding results compared to other methods. We also find their comments on the transition from research to a real commercial application interesting.

27. Unified Entropy Theory and Maximum Discrimination on Pattern Recognition

This chapter presents the unified entropy theory on pattern recognition. Based on this theory, the authors prove theoretically and practically, with experiments on Chinese character recognition, that mutual information is directly proportional to accuracy in pattern recognition.

28. Fundamentals of Biometrics – Hand Written Signature and Iris

This chapter is a well-written, extensive review of handwritten signature and iris recognition methods. All aspects of offline and online handwritten signature analysis systems are discussed: the methodology used, preprocessing, feature detection, classification, acquisition, existing databases, and commercial systems. The iris-based biometrics is discussed in detail, from iris anatomy to feature extraction as well as preprocessing and classification methods. This chapter is an excellent start for researchers interested in handwritten signature analysis or iris recognition.

29. Recent Trends in Iris Recognition

This is a short review of iris recognition methods,

tackling the basic modules of current systems. It mentions briefly the performance measures and discusses some limitations of current techniques.

While we cannot argue about the correctness of its content we did not find this chapter useful considering that the previous chapter contains a more extensive overview of iris recognition systems.

30. Using Multisets of Features and Interactive Feature Selection to Get Best Qualitative Performance for Automatic Signature Verification

This chapter presents a method for automatic (offline) signature verification where multiple sets of features are used, in contrast to other current methods that use one set of features. Features used in this research are: percentage of slant measured globally and locally on six regions of the signature, the coordinates of gravity center, the width and height, the baseline and the percentage of signature pixels from the total area. Multiple sets of features are selected by the “circulant matrix” technique briefly described here. Experiment results show an important performance improvement over the method using one set of features. An interactive tool for feature selection proven useful in this research is also discussed.

31. Fourier Transform in Numeral Recognition and Signature Verification

This chapter starts with an introduction to the Fourier transform and discrete Fourier transform and their properties. Then it is shown how DFT can be used for handwritten numeral recognition and for online signature verification. This chapter is missing a comparison with other methods and experimental results.

Conference Report: [MCPR 2012](#)

4th Mexican Conference on Pattern Recognition

June 27-30, 2012
Huatulco, Mexico

Honorary Chair
[Kim Boyer](#), IAPR Fellow (USA)

Chairs:
[José Francisco Martínez Trinidad](#), (Mexico)
[Jesús Ariel Carrasco Ochoa](#) (Mexico)
[José Arturo Olvera López](#) (Mexico)

Report prepared by José Francisco Martínez Trinidad

The 4th Mexican Conference on Pattern Recognition (MCPR2012) was held at the hotel Las Brisas in Huatulco, Mexico. The conference was organized by the Computer Science



by the Scientific Committee, composed of internationally recognized scientists, all experts in their respective fields, who prepared an excellent selection.

The 32 accepted

Department of the National Institute for Astrophysics Optics and Electronics (INAOE). MCPR2012 was sponsored by the Mexican Association for Computer Vision, Neural Computing and Robotics (MACVNR) and the International Association for Pattern Recognition (IAPR).

papers were published by Springer Verlag in the volume [Pattern Recognition, LNCS 7329](#), edited by Jesús Ariel Carrasco-Ochoa, José Francisco Martínez-Trinidad, José Arturo Olvera-López, and Kim L. Boyer.

MCPR2012 received contributions from 18 countries. In total 64 papers were submitted, out of which 32 were accepted for publication in these proceedings and for presentation at the conference. The review process was carried out

Three professors were invited to give keynote addresses and tutorials on topics in Pattern Recognition: Prof. Gabriella Sanniti di Baja (IAPR invited speaker), Director of Research, Institute of Cybernetics "E. Caianiello" (CNR), Italy; Professor Sven Dickinson, head of the Department of

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Computer Science, University of Toronto, Canada; and Professor Humberto Sossa, from the Center for Computing Research, National Polytechnic Institute, Mexico.

During the event, meals took place at the hotel Las Brisas in Huatulco. The conference finished with a dinner at a secret beach at sunset.

The conference was organized in one track for oral presentations. We are sure that MCPR 2012 provided a fruitful forum that helped to enrich the collaboration between the Mexican Pattern Recognition researchers and the broader international Pattern Recognition community.

The steering committee for the MCPR decided the 5th Mexican Conference on Pattern Recognition will be held in Queretaro, Mexico, in the last week of June 2013.



Proceedings of the workshop have been published by Springer in the series Lecture Notes in Computer Science (Volume 7329)

Conference Report: ICISP 2012

5th International Conference on Image and Signal Processing

June 28 – 30, 2012
Université Ibn Zohr, Agadir, Morocco

General Chairs:

Driss Mammass (Morocco)
Abderrahim Elmoataz (France)

Program Chairs:

Olivier Lézoray (France)
Fathallah Nouboud (Canada)
Driss Aboutajdine (Morocco)

Report prepared by Fathallah Nouboud

The Fifth International Conference on Image and Signal Processing (ICISP 2012) brought together about 60 researchers from more than 17 countries in the beautiful city of Agadir, Morocco. Historically, ICISP is a conference resulting from the actions of researchers from Morocco, France, and Canada. The first and second editions of ICISP were held in Agadir, Morocco in 2001 and 2003. The third edition was held in Cherbourg-Octeville, in Normandy, France, in 2008. The fourth edition was held in Trois-Rivières, Québec, Canada, in 2010. ICISP 2012 was sponsored by EURASIP (European Association for Image and Signal Processing) and the IAPR (International Association for Pattern Recognition).

The Program Committee members carried out the review process. Each paper was reviewed by at least two reviewers, and also checked by the conference co-chairs. From 156 full papers submitted, 69 were finally accepted (54 oral presentations, and 15 posters) giving an acceptance rate of 44.2%. We took pride in arranging a one-track conference and could not accept more

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Invited speaker: Matti Pietikäinen



Invited speaker: Denis Laurendeau

(Continued from page 22)

contributions.

The conference program included three keynote talks by world renowned experts. The first keynote was given by Matti Pietikäinen, director of Infotech Oulu Research Center, Finland. The second keynote was given by Denis Laurendeau, President of the International Association for Pattern Recognition (IAPR), director of the REPARTI Research Center and head of the Computer Vision and Systems Laboratory at Laval University, Quebec, Canada. The third keynote

Proceedings of the conference have been published by Springer LNCS (Volume 7340)

was given by Saad Biaz, Shelby Center of Engineering Technology, Auburn University, USA.

The Conference banquet took place in the Chems Ayour Complex (with folk animation, Fantasia, Acrobats, and Oriental dancers).

The next ICISP will be organized in Cherbourg-Octeville, Normandy, France in 2014



Please check the ICPR 2012 web site www.icpr2012.org frequently.

ICPR

The 21st International
Conference on Pattern Recognition

2012

November

11-15, 2012

Tsukuba International Congress Center
Tsukuba Science City, JAPAN

General chairs

Jan-Olof Eklundh (Sweden), Yuichi Ohta (Japan), Steven Tanimoto (USA)

Program chairs

Alberto Del Bimbo (Italy), Kim L. Boyer (USA), Katsushi Ikouchi (Japan)

Track chairs

Computer & Robot Vision

Richard Bowden (UK)
Sing Bing Kang (USA)
Long Quan (China)

Virtual Reality & Medical Applications

Tobias Höllerer (USA)
Gudrun Klinker (Germany)
Naokazu Yokoya (Japan)

Pattern Recognition & Applications

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Important Dates

Deadline for paper submission
Notification of paper acceptance
Camera ready papers and author registration
Deadline for workshop proposal
Deadline for tutorial proposal
Deadline for contests proposal

March 31, 2012
June 15, 2012
July 15, 2012
January 6, 2012
April 30, 2012
July 15, 2011

Signal, Speech, and Video Processing

Tsuihan Chen (USA)
Touradj Ebrahimi (Switzerland)
Kyoung Mu Lee (Korea)

Document Analysis

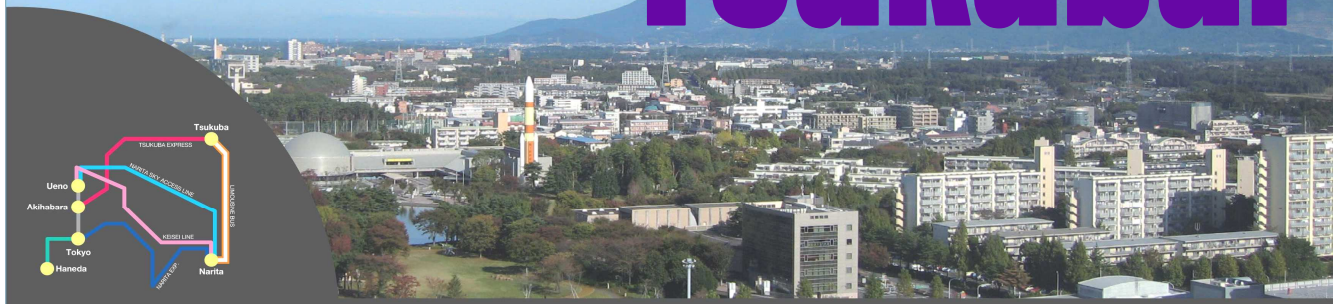
Bidyut B. Chaudhuri (India)
Koichi Kise (Japan)
Daniel P. Lopresti (USA)

Yoichi Sato (Japan), Rahul Sukthankar (USA)
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Hiroshi Sako (Japan), Keiji Yamada (Japan)
Atsushi Iliya (Japan), Kazuhiro Fukui (Japan)
Ken-ichi Maeda (Japan)
Kenji Suzuki (Japan)
Itaru Kitahara (Japan), Takeshi Kurata (Japan)

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

The aim of this conference is to
bring together
international experts
to share their experiences
and to promote
research and development in
Pattern Recognition.

See you in Tsukuba!



Position Posting

IMT Institute for Advanced Studies Lucca Post-Doctoral Fellow in Pattern Recognition and Machine Learning Applied to Image Analysis

Deadline for applications: October 31, 2012

IMT Institute for Advanced Studies Lucca invites applications for a Post-Doctoral Fellow position in Pattern Recognition and Machine Learning Applied to Image Analysis. The candidate will join a rapidly growing and interdisciplinary group that collaborates with a variety of laboratories across the world to develop new methods for image analysis (segmentation and detection) and the discovery of patterns in multidimensional datasets arising in imaging problems in natural and life sciences. The ideal candidate should have a strong background in image processing and analysis, in pattern recognition and machine learning and have a strong interest in bridging the gap to the medical/biological/natural sciences. The ideal candidate should have excellent programming skills and a strong mathematical background. Experience in applying such techniques in (bio) medical imaging applications (for example cardiac or brain imaging, cell imaging) will be considered a plus. A PhD in a related discipline is required. Candidates must have an excellent record of high-impact international publications and should demonstrate enthusiasm for performing applied research in an interdisciplinary Research Unit.

The Fellow will join the Research Unit PRIAn - Pattern Recognition and Image Analysis (<http://prian.imtlucca.it/>).

IMT Lucca (<http://www.imtlucca.it>) is a public international Graduate School and Institute of Technology that acts as a research university with the aim of forming human capital in disciplines characterized by their high potential for concrete applications. IMT strives to reach the fusion of theoretical comprehension and practical relevance.

Appointment compensation packages will depend on the candidates and their records of accomplishment, but are competitive on an international level. Applicants must be able to teach graduate courses in English; knowledge of Italian is not required.

Interested candidates must apply by filling in the online application form at http://www.imtlucca.it/faculty/positions/junior_faculty_recruitment_program.php. They will also be asked to submit a CV, research paper (published or working) and the name and contact details of three referees.

For further information about the position, applicants can refer to the website, or can contact pdf.calls@imtlucca.it.

The deadline for applications is October 31st, 2012.

Follow us on Facebook, LinkedIn and visit the Institute on YouTube.

Of interest...Books available for review

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

Titles in Springer's *Advances in Computer Vision and Pattern Recognition* series, available now or soon:

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(ISBN 978-1-4471-2457-3)

<http://www.springer.com/computer/image+processing/book/978-1-4471-2457-3>

Handbook of Iris Recognition by Mark J. Burge

(ISBN 978-1-4471-4401-4)

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(ISBN 978-1-4471-4639-1)

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Other recently published titles of interest from Springer London include:

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<http://www.springer.com/computer/theoretical+computer+science/book/978-1-4471-4074-0>

Two-Dimensional Change Detection Methods by Murat İlsever

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Softcover (also known as softback) version (ISBN 978-1-4471-4215-7)

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Introduction to Video and Image Processing by Thomas B. Moeslund

(ISBN 978-1-4471-2502-0)

<http://www.springer.com/computer/image+processing/book/978-1-4471-2502-0>

3D Computer Vision, 2nd ed. by Christian Wöhler

Hardcover version (ISBN 978-1-4471-4149-5)

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Meeting and Education Planner

NOTE: This is not an exhaustive list of workshops, conferences, and summer schools. It is a list of meetings supported by IAPR plus additional meetings that have been brought to the attention of the editor (these non-IAPR meetings are denoted with an *). The [IAPR web site](#) has more up-to-date information about [IAPR workshops, conferences and summer schools](#). Additional meetings that may be of interest to the IAPR Community can be found at 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.

2012

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|---------------------------------|---|--|--------------|
| PRIB 2012 | 7th IAPR International Conference on Pattern Recognition in Bioinformatics | Tokyo, Japan | 8-10 Nov 12 |
| WDIA 2012 | International Workshop on Depth Image Analysis | Tsukuba Science City, Japan | 11 Nov 12 |
| MPRSS12 | 1st International Workshop on Multimodal Pattern Recognition of Social Signals in Human Computer Interaction | Tsukuba Science City, Japan | 11 Nov 12 |
| PRHA12 | International Workshop on Pattern Recognition for Healthcare Analytics | Tsukuba, Science City, Japan | 11 Nov 12 |
| PRRS12 | Pattern Recognition in Remote Sensing | Tsukuba, Science City, Japan | 11 Nov 12 |
| VAIB12 * | Visual observation and analysis of animal and insect behavior | Tsukuba, Science City, Japan | 11 Nov 12 |
| IWCF12 * | 5th International Workshop on Computational Forensics | Tsukuba, Science City, Japan | 11 Nov 12 |
| PRCA12 * | First International Workshop on Pattern Recognition and Crowd Analysis | Tsukuba, Science City, Japan | 11 Nov 12 |
| TrakMark 2012 * | The 3rd International Workshop on Benchmark Test Schemes for AR/MR Geometric Registration and Tracking Method | Tsukuba, Science City, Japan | 11 Nov 12 |
| ICPR 2012 | 21st International Conference on Pattern Recognition | Tsukuba, Science City, Japan | 11-15 Nov 12 |
| S+SSPR2012 | Joint IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR) and Statistical Techniques in Pattern Recognition (SPR) | Miyajima-Itsukushima, Hiroshima, Japan | 11-15 Nov 12 |
| DICTA 2012 | Digital Image Computing Techniques and Applications | Fremantle, Western Australia | 3-5 Dec 12 |

Meeting and Education Planner (continued)

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

2013

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|----------------------------|--|---------------------|--------------|
| CCIW 2013 | Fourth Computational Color Imaging Workshop | Chiba, Japan | 4-5 Mar 13 |
| DGGI 2013 | 17th IAPR International Conference on Discrete Geometry for Computer Imagery | Sevilla, Spain | 20-22 Mar 13 |
| PSL 2013 | 2nd International Workshop on Partially Supervised Learning | Nanjing, China | 13-14 May 13 |
| MCS 2013 | 11th International Conference on Multiple Classifier Systems | Nanjing, China | 15-17 May 13 |
| MVA 2013 | 13th IAPR International Conference on Machine Vision Applications | Kyoto, Japan | 21-23 May 13 |
| ISMM 2013 | 11th International Symposium on Mathematical Morphology | Uppsala, Sweden | 27-29 May 13 |
| ICB 2013 | 6th IEEE/IAPR International Conference on Biometrics | Madrid, Spain | 4-7 Jun 13 |
| GREC 2013 | 10th IAPR International Workshop on Graphics Recognition | Bethlehem, PA, USA | 21-21 Aug 13 |
| ICDAR 2013 | 12th International Conference on Document Analysis and Recognition | Washington, DC, USA | 25-28 Aug 13 |
| CAIP 2013 | 15th International Conference on Computer Analysis of Images and Patterns | York, UK | 27-29 Aug 13 |
| ACPR 2013 | 2nd IAPR Asian Conference on Pattern Recognition | Okinawa, Japan | 5-8 Nov 13 |
| CIARP 2013 | 18th Iberoamerican Congress on Pattern Recognition | Havana, Cuba | 20-23 Nov 13 |