

IAPR
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Newsletter
Volume 35, Number 2
April 2013

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Letter from the President Kim L. Boyer, IAPR Fellow

Being elected the President of IAPR is a singular honor; I am humbled by your confidence in me and will do my utmost to serve the interests and advance the mission of our great organization. IAPR is all about the people. You are our most precious resource.

It has been my privilege to work with a number of IAPR presidents over the years, both on the Executive Committee and in other capacities: Drs. Kasturi, Lovell, Sanniti di Baja, Kropatsch, Tombre, Bunke, and – of course – my immediate predecessor, Denis Laurendeau. Reaching farther back in time, I was fortunate to have our founder, KS Fu, as a professor for two courses during my days as a graduate student at Purdue. Scholars all. Each has brought skill, diplomacy, and vision to the position, and I have learned a great deal from them. It will be my objective to use what I've learned from the examples they set, to continue moving the Association forward scientifically and intellectually, while expanding our footprint geographically.

The Executive Committee met in Tsukuba and outlined a number of initiatives and issues to address in the coming biennium. Many of these are continuing efforts, as some things naturally have lengthy gestation periods. In particular, we continue to encourage the development of summer schools



IAPR Then and Now

Look for these boxes throughout this issue.

Thanks to the *IAPR Newsletter* archive, we are able to take a peek at IAPR 30 years ago.



CALLS for PAPERS

For the most up-to-date information on IAPR-supported conferences, workshops and summer schools, please visit the IAPR web site: www.iapr.org/conferences/

PreMI'13

5th International Conference on Pattern Recognition and Machine Intelligence
Kolkata, India
Dates: Dec. 10-14, 2013
Deadline: Apr. 30, 2013

CIARP 2013

18th Iberoamerican Congress on Pattern Recognition
Havana, Cuba
Dates: Nov. 20-23, 2013
Deadline: Jun. 15, 2013

HIP 2013

2nd International Workshop on Historical Document Imaging and Processing
Washington, DC, USA
Dates: Aug. 24, 2013
Deadline: May 15, 2013

2014

PRL Special Issue

Celebrating the Life and Work of Maria Petrou
Publication Date: Jan. 1, 2014
Deadline: Jun. 1, 2013

ICPR 2014

22nd International Conference on Pattern Recognition
Stockholm, Sweden
Dates: Aug. 24-28, 2014
Deadline: Dec. 20, 2013

ACPR 2013

2nd IAPR Asian Conference on Pattern Recognition
Okinawa, Japan
Dates: Nov. 5-8, 2013
Deadline: Jun. 10, 2013

ICFHR 2014

14th International Conference on Frontiers in Handwriting Recognition
Crete, Greece
Dates: Sep. 1-4, 2014
Deadline: Feb. 10, 2014

PSIVT13

6th Pacific-Rim Symposium on Image and Video Technology
Guanajuato, México
Dates: Oct. 28-Nov. 1, 2013
Deadline: Jun. 15, 2013

S+SSPR 2014

Joint Workshops on Statistical Techniques in Pattern Recognition (SPR 2014) and Structural and Syntactic Pattern Recognition (SSPR 2014)
Joensuu, Finland
Dates: Aug. 20-22, 2014
Deadline: Mar. 1, 2014

LS2013

ISPRS Workshop on Laser Scanning 2013
Antalya, Turkey
Dates: Nov. 11-13, 2013
Deadline: Jun. 15, 2013

and related workshops and scholars programs, especially those targeting under-served geographical areas, as a natural focal point for technical committee activities and community building. We have budgeted resources for this purpose – and we want to see them put to good use in advancing our mission as a global, learned society.

Another concern that the ExCo will be addressing is to identify a permanent solution to funding our premiere awards, the KS Fu and JK Aggarwal prizes. We need an approach that obviates recurring problems with low interest rates. We have ample resources; it's a matter of agreeing on the best way.

The Conferences and Meetings, Advisory, Publications and Publicity, and ICPR Liaison Committees are being asked to study the organization and structure of future ICPRs. Is the current multi-track structure best serving our needs? Are acceptance rates appropriate? How do we attract work of the highest quality? We face some vexing issues on indexing and the perceived quality and prestige of ICPR. We need to look into the issue, identify the problem(s), and formulate solutions. This is not a time to "wait and see". Reputations are delicate, and they take a long time to rebuild.

During any biennium a number of issues arise that require a vote of the GB. Our bylaws currently require a 45-day

voting period, but that requirement was established before the advent of email. The Constitution and Bylaws Committee will work with the Advisory Committee to recommend changes to our voting procedure. Separately, I will investigate the purchase of electronic “clickers” to speed the voting process during GB meetings. An inordinate amount of precious time is typically spent in the distribution and collection of (and occasionally in trying to read) written ballots. We use clickers in our classes at Rensselaer; I see no reason why they shouldn’t work for GB meetings, too.

The Education Committee has been asked to provide detailed guidelines for application and selection of the IAPR Research Scholarship. We would like to get that program, under discussion for nearly four years, launched during this biennium.

The Industrial Liaison Committee presented a very nice report to the GB in Tsukuba outlining ways to reinvigorate our interaction with industry in a manner beneficial to both. This cycle, we ask them to begin the implementation of these ideas.

The Membership Committee’s mission is, perhaps, obvious. But it’s worth mentioning here that a substantial well of untapped talent lies in Latin America. It is an active, scientifically emerging region of enormous potential. We shall not neglect them.

Arjan Kuijper now assumes the position of newsletter editor, following the excellent tenure of Alexandra Branzan-Albu. Please support him with material on your TC’s activities, conference/workshop/summer school reports, book reviews, and anything else you think would be of interest to the IAPR community at large.

Linda O’Gorman’s service in producing the Newsletter and as IAPR Secretariat and Paymaster (and for reminding me to write this letter!) are essential to the ability of the ExCo to get its work done – and not lose our “day jobs” in the process. I’ve worked with Linda for more than six years now, and I can never thank her enough.

The dedication of the IAPR webmaster, Ed Sobczak, and the kind consideration of Prof. Sarghur Srihari for providing us with computing resources, cannot be overstated. We all owe them a debt of gratitude.

This last item is personal for me, and for many of you. We were all deeply saddened to learn of the loss of our dear friend and colleague, Maria Petrou. In Tsukuba the Governing Board approved the creation of a prize named in her honor. The Advisory Committee has been asked to develop a set of guidelines for the award, with an eye to final approval and implementation at the 2014 GB meeting in Stockholm.

I wish you a successful and productive biennium; I look forward to seeing you in Stockholm.

Sincerely,



Kim L. Boyer

The *IAPR Newsletter* is published in association with the IAPR website, www.iapr.org

The *IAPR Newsletter* is published four times per year, during the third week of January, April, July, and October.

Deadline for the July issue: June 21, 2013

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Getting to Know...David G. Stork, IAPR Fellow

How do images convey meaning?

by [David G. Stork](#)

Distinguished Research Scientist, Research Director, [Rambus Labs](#)
(USA)

David G. Stork, IAPR Fellow

ICPR 2008, Tampa, Florida, USA

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

My introduction to the mysteries of pattern classification came as a young child, through my family, which for generations has been steeped in the arts; my great grandfather was court painter to the Crown Prince Rudolf of Austria, my little sister was the Chief Calligrapher in the White House under Bill Clinton, and there have been several direct and indirect family members in the arts in between. My grandfather's art collection included works by important artists such as Winslow Homer, John Singer Sargent, James McNeill Whistler, Albert Pinkham Ryder, Paul Dougherty, Nicolas Roerich, and others, and my father was a very avid amateur photographer. During nature walks, my father challenged me and my sisters to find patterns in nature—faces in clouds, animals in rock outcroppings, letterforms in dry mud, and so forth—a sort of advanced version of the child's game I spy. Such games illustrated the role of the perceiver, the pattern recognizer. Through these fun games, and frequent home slide shows, I developed a visual awareness and curiosity, and to this day, I greatly enjoy solving visual puzzles such as Where's Waldo?, What's the difference between these two photos?, How many triangles are in this geometric figure? What's the next shape in this series?, and so on. When I studied geometry in seventh grade, I could simply see the proofs, almost effortlessly.

Our family frequently visited art museums, but abstract art, such as by Jackson Pollock, Mark Rothko, Franz Kline, and many

David G. Stork received his BS from MIT and his MS and PhD from the University of Maryland, College Park, all in physics. He also studied art history at Wellesley College and is an accomplished semi-professional orchestral musician, having performed in major concert halls and opera houses and appeared on eight compact disks. He taught his first full college course, "The physics of aesthetics and perception," at Wellesley College at age 24, and has held faculty appointments in physics, mathematics, computer science, statistics, electrical engineering, neuroscience, psychology and art and art history variously at Wellesley and Swarthmore Colleges as well as Clark, Boston, and Stanford Universities. He's been the

others, meant little or nothing to me for many years. All that changed during a simple docent tour of American Art at Mid-century, an exhibition of Abstract Expressionist art at the newly opened East Wing of the National Gallery of Art in Washington. That 30-minute walking tour opened my eyes to a new visual world, and I was amazed how the same image on my retina could mean so much more once I knew what to look for. I later studied Art History at Wellesley College, which opened my eyes even

more, this time in a scholarly, rigorous way, and to an even broader spectrum of art.

I wrote my BS thesis on a computational model of color perception under the direction of Edwin Land, CEO of the Polaroid Corporation, leading entrepreneur and inventor, and this was my introduction to the study of models and algorithmics of perception. A year or two later, epiphany struck while simply driving to graduate school one morning. I had the deep awareness and

Chief Scientist of two high-tech corporations and is currently Distinguished Research Scientist and Research Director at [Rambus Labs](#) in Silicon Valley, where he heads the Computational Sensing and Imaging Group. He has published over 160 technical articles in a wide variety of fields, and eight books/proceedings, including *Pattern Classification* (Duda, Hart and Stork, Wiley 2001), *Seeing the light: Optics in nature photography, color, vision and holography* (Falk, Brill and Stork, Wiley 1986), *HAL's Legacy: 2001's computer as dream and reality* (ed., MIT 1998) and *Computer vision and image analysis of art II* (Stork, Coddington, Bentkowska-Kafel, eds., SPIE 2011). He is completing the third edition of *Pattern classification* (Wiley), a popular book, *How to ask good questions*, and *Pixels and paintings: Computer image analysis in the study of art* (Wiley). He has served on editorial boards of six international journals and lectured widely on pattern recognition, machine learning, computer vision and related fields. He has presented his work on computer image analysis of art at dozens of art museums, including the Louvre, National Gallery Washington, National Gallery London, and Venice Biennale. His documentary, *2001: HAL's Legacy*, compared the computer science predictions or "visions" in *2001: A Space Odyssey* with actual developments in computer technology was first broadcast nationwide on PBS in 2001. His current research centers on new classes of digital camera image sensors and ultra-miniature computational image sensors, in which nonstandard optical elements and pattern recognition algorithms are designed together to extract application-specific information, including images, from the visual world.

Dr. Stork is Fellow of IAPR and of SPIE, and Senior Member of the Optical Society of America (OSA), Association of Computing Machinery (ACM) and IEEE.

almost visceral reaction to the issue Plato considered: the fact that that the image on the retina from a tree (for instance) was not a tree. Where did "tree" exist? All this led ultimately to the question that has undergirded my intellectual and cultural life: How do images convey meaning?

I completed my PhD thesis on modeling human visual motion perception, and continued throughout a career in pattern recognition, machine learning, computer vision and optics, with numerous applications, such as speechreading ("lipreading"), along the way. I was fortunate to be asked to write the second edition of [Pattern Classification](#), which deepened my mastery of this large subject. (Actually, it was in writing its Solution Manual that I learned most of what I know!) One of my new chapters, *Algorithm-independent machine learning*, focusses on some very deep topics, such as Occam's razor (the simplest explanation or model that fits data should be preferred), but how do we know what is simple or which of two models is simpler? And why are simpler models better? These are questions that go to the very foundation of pattern classification and indeed philosophy.

In working on a number of practical pattern classification problems, I realized that the important step of collecting data had not received adequate scholarly attention, and this led me, in 1996, to found and lead the Open Mind Initiative. Open

Mind has been called the first framework for collecting non-expert data willingly contributed over the internet, and its component projects, such as [Open Mind Common Sense](#), Open Mind Optical Character Recognition and others, were a forerunner of systems such as Games with a purpose (GWIPs), [Amazon Mechanical Turk](#), and others. In the current era of “big data,” I believe we, as big data scholars, will have to solve a number of tricky problems in efficient data acquisition and truthing.

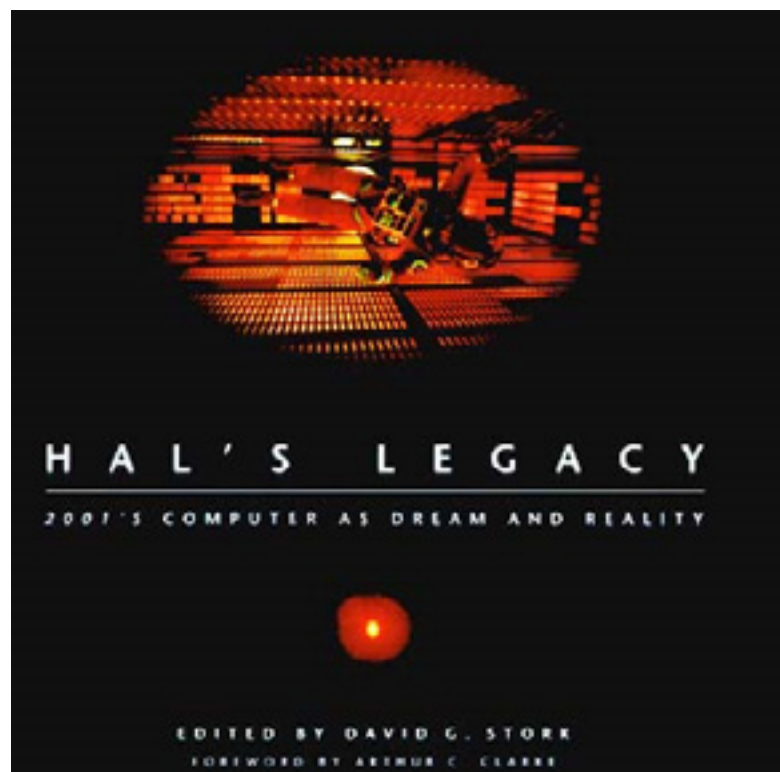
Because I had written a textbook on optics and had worked on art, in 2001 I was asked by a major symposium to present at my technical analysis of artist [David Hockney's](#) intriguing claim that Renaissance artists as early as 1420 secretly used optical projectors to achieve a newfound realism. Although the overwhelming, and ultimately unanimous, conclusion of dozens of independent scholars worldwide is to reject the bold theory, it spurred development of a number of powerful techniques in computer analysis of lighting, perspective, brushstrokes, “optical effects” which are being explored by the art world. At the moment, for instance, I’m using computer methods to aid art scholars at the [Museum of Modern Art](#) for their upcoming show of René Magritte and with scholars at the Metropolitan Museum of Art for a reanalysis of the **Mérode Altarpiece**, one of the most important works of the early Renaissance.

I saw the feature film 2001: A Space Odyssey (based on the book of the same title by Arthur C. Clarke) as a child and though I didn’t understand it then, I was intrigued, even awed, by its portrayal of the evolution of intelligence and its central character, the HAL 9000 computer. (My automobile license plate is HAL 9000.) In 1998 I edited a book, *HAL’s Legacy: 2001’s computer as dream and reality*, which compared 2001’s computer science visions or “predictions” with actual developments, all in its namesake year, and co-created a PBS television documentary based on my book. It was great fun to fly to AI research labs to film the state of the art in computer chess, computer vision, speech recognition, and so on, and to Sri Lanka to interview Arthur C. Clarke.

Currently I lead a team designing new classes of computational sensors and imagers, where the novel optical devices and the image processing/pattern recognition algorithms are integrated for new functionality. At the deepest intellectual level, I’m intrigued by algorithms for making sense of signals produced by unusual optical elements, since this is analogous to how our brains make sense of the raw sensed neural signals, which in most ways are not “image like.”

In short, I remain fascinated by the question that struck me decades ago: How do images convey meaning?

I always will.



IAPR...The Next Generation

In this new series of Feature Articles, the IAPR Newsletter asked young researchers to respond to three questions:

- Briefly: How did you get involved in pattern recognition and what technical work have you done?
- In more detail: What is/are your current research interest(s)?
- How can the IAPR help young researchers?

~Arjan Kuijper, Editor -in-Chief

by [Soweon Yoon](#)

Department of Computer Science and Engineering, Michigan State University (USA)

1. Briefly: How did you get involved in pattern recognition and what technical work have you done?

In the senior year of my undergraduate studies, students were encouraged to initiate research experience under the supervision of a professor and in his laboratory. Based on the courses I had taken in a broad range of topics in electrical and electronic engineering, I developed a liking for signal processing and, in particular, image processing. Among the various labs conducting signal processing research, the Biometrics Engineering Research Center (BERC) under the leadership of Professor Jaihie Kim was one of the largest research groups at my university and carried out interesting research in biometrics and computer vision. After learning what biometrics is and the research

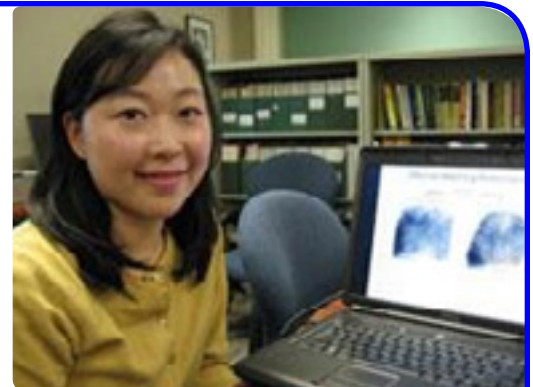
activities at the BERC, I was sufficiently intrigued to try my very first research experience in biometrics.

Biometrics research is about how to recognize an individual based on their physical or behavioral attributes, such as the patterns of friction ridges on fingertips, distinct facial characteristics of each person, or the rich texture in irises. Fortunately, I had opportunities to explore various biometric modalities from different

perspectives in my research experiences.

The first task in my undergraduate research was human detection and tracking in far infra-red images. Far infra-red cameras are routinely deployed at the airports, especially in Asian countries, to detect people who have high body temperature possibly due to infection after international travel. They are also used to monitor human activity at night time. With far infra-red images

Soweon Yoon is a Ph.D. student in the Department of Computer Science and Engineering, Michigan State University. Her research emphasis during her Ph.D. study is on friction ridge biometrics, in particular, latent fingerprint matching, altered fingerprints, and fingerprint modeling. She received the IAPR Best Biometrics Student Paper Awards at the [International Joint Conference on Biometrics \(IJCB\) in 2011](#) and at the [International Conference on Biometrics \(ICB\) in 2012](#), respectively, and the Best Poster Award at the ICB in 2007. She received her B.S. and M.S. degrees from the School of Electrical and Electronic Engineering, Yonsei University, Seoul, South Korea, in 2006 and 2008, respectively.



representing temperature in grayscale images, human faces were detected by morphological image processing and shape fitting for facial contour.

As I decided to continue my master's study at the BERC, I worked on developing a prototype system of iris recognition at a distance. Although iris recognition was already known for its high accuracy in human identification, it requires a high degree of user cooperation during image acquisition, which is one of the main hindrances to widespread deployment of iris recognition systems. We designed a pan-tilt-zoom camera system to capture iris images in less constrained environments at a distance from 3 feet to 10 feet. The challenging task was to estimate the 3-dimensional position of the subject's face to control the camera movement and determine optical factors in order to get iris images with sufficient resolution and sharpness.

Then, I moved on to fingerprint recognition research as my Ph.D. thesis topic at Michigan State University with Professor Anil K. Jain, mainly focusing on latent fingerprint matching, detection and matching of altered fingerprints, and fingerprint modeling.

2. In more detail: What is/are your current research interest(s)?

Many people are probably aware that fingerprints are widely used to catch suspects and track criminals by watching TV series such as "CSI:

Crime Scene Investigation" or hearing news that fingerprints played an important role in solving a high profile crime. From these successes of fingerprint recognition, one may form an impression that human identification based on fingerprints is not only extremely accurate, but is almost a solved problem.

In many fingerprint recognition applications, such as background check, international border crossing, or secured facility access, where subjects are very cooperative and willing to be verified, fingerprints do achieve very high recognition accuracy. However, in the case of crime scene investigations dealing with fingerprints unintentionally left at crime scenes, fingerprint identification becomes extremely challenging due to the poor quality of these fingerprints. The fingerprints lifted from the surface of an object are called latent fingerprints, and latent fingerprint identification commonly involves human experts in latent print examination (e.g., for feature markup in latents).

A significant amount of research in latent fingerprint identification is required not only for developing accurate and fast automated latent matchers, but for alleviating the subjectivity of human experts in latent examination. Among the many challenging tasks in latent identification, I am specifically focusing on latent fingerprint enhancement that aims to strengthen the clarity of ridge structures in latent images so that automatic matchers can successfully extract features

from the enhanced images.

The success of fingerprint recognition in law enforcement and border control applications in determining an individual's identity has prompted another interesting problem, fingerprint alteration. Several cases were reported in the press that some criminals and illegal aliens were found to have altered their fingerprints by means of abrading, cutting, burning, or even performing plastic surgery on the fingertips in order to avoid identification by their fingerprints. To address the issue of fingerprint alteration, the following research problems have been studied: (i) detection of altered fingerprints based on abnormality in fingerprint ridge patterns and (ii) matching altered fingerprints to their pre-altered mates.

During the study of these two topics, my research interest naturally shifted to modeling of fingerprint patterns since these models are very helpful to find fingerprint ridge patterns in noisy images (e.g., latent fingerprint images) and to determine the degree of abnormality in a given fingerprint (e.g., altered fingerprints). I am currently interested in developing mathematical models that represent distinct characteristics of fingerprint patterns that can differentiate fingerprints from any other textured patterns.

3. How can the IAPR help young researchers?

As a Ph.D. student, I think it is very important to stay motivated and inspired. While every researcher may have

different reasons to pursue a higher level of education, I believe that a common trigger is natural curiosity and creativity. In this regard, the research community and society can boost curiosity and creativity by introducing cutting-edge research in the pattern recognition field and also by providing more opportunities to promote the work of young researchers to the society, which helps them to find value in what they are doing. Conferences and workshops are probably one of the best ways for a Ph.D. student to connect and communicate with other researchers in the field. Fostering a research atmosphere to value the scientific meetings and boosting participation in conference activities will greatly help encourage young researchers to excel in their studies.

I also believe that most Ph.D. students face difficult and frustrating situations during their program. The reasons are not only because they often face the challenges in solving a difficult research problem, but also because they often confront issues related to time management, mental and physical health, and social relationships. Sharing the experiences with and seeking advice from senior researchers in the field would be very helpful to guide young researchers towards successful careers.

In Memoriam

Taras Vintsiuk

March 10, 1939 - May 29, 2012



Portable devices (2001-2006): digital audio recorded controlled by voice “Vokofon” and spoken dictionary-interpreter.

On May 29, 2012, after a long illness, eminent scientist and founder of the trend in pattern recognition theory Doctor, Professor Taras Klymovych Vintsiuk died.

Taras Vintsiuk was born on March 10, 1939, in the village of Kulchyn, Volyn’oblast, in a family repressed by Soviet regime. In the postwar years, he lived in an orphanage and later went to live with relatives. In 1956, he graduated from school with a gold medal. From 1956-1961, he studied at the Kiev Polytechnic Institute and graduated with honors.

His scientific work began in 1962 as an engineer, and by 1988, he was head of the Speech Science Department (1988) at the Hlushkov Institute of Cybernetics. From 1997, he led the International Research and Training Center for Information Technologies and Systems.

A widely applied generative model for pattern recognition was first formulated and proposed by Taras Vintsiuk in 1967. This approach, commonly known as Dynamic Time Warping (DTW), is used not only in the theory of speech and visual pattern recognition, but also in text processing and non-linear process modelling in radio-physics and bioinformatics. A similar model, known as Hidden Markov Model (HMM), was originated in 1973 and is the most cited in the world. Both models are most productive in systems of speech recognition and possess global leading positions.

Since late 1960s, the teams led by Taras Vintsiuk developed speech recognition systems having passed a long way from spoken dialogue systems based on the BESM to portable devices with voice control.



The scientific research of Taras Vintsiuk is reflected in more than 300 papers and two books. In the group of authors, he was awarded the State Prize of Ukraine in 1988 and in 1997 in the field of science and technology. Taras Vintsiuk is creator of the Pattern Computer Concept that formed the basis of the National Scientific and Technical Program (2000-2010).

Taras Vintsiuk was a member of many scientific societies, program committees and editorial boards of many conferences and publications. In 1992, he founded the Ukrainian Association for Information Processing and Pattern Recognition (UAsIPPR), which is the IAPR Member Society from Ukraine. He served as the association's President and representative on the IAPR Governing Board from that time until his death in 2012. Since 1992, he organized

10 international conferences on signal processing and pattern recognition "UkrObraz" and published the conference proceedings. Since 2004, Taras organized annual summer schools dedicated to speech science and technology.

Taras Vintsiuk opened a new era of speech pattern recognition. We live with the memory of this great Scientist, Volunteer, and Teacher and carry on the work he started.

Conference & Workshop Reports

International Conference on Informatics, Electronics & Vision (ICIEV12)



Honorary Chair:

[Jeff Cohn](#), University of Pittsburgh & Carnegie Mellon University, USA

General Co-Chair:

[Matthew Turk](#), University of California, Santa Barbara, USA

Secretary:

[Md. Atiqur Rahman Ahad](#), University of Dhaka, Bangladesh

<http://iciev.org>

by Md. Atiqur Rahman Ahad and Matthew Turk

& Engineering Research ([CNSER](#)).

Introduction:

The International Conference on Informatics, Electronics & Vision (ICIEV) 2012 was Technically co-sponsored by the IEEE Communication Society BD chapter, sponsored by the Optical Society of America ([OSA](#)) and endorsed by the International Association for Pattern Recognition (IAPR). The ICIEV12 was organized by the Center for Natural Sciences

Manuscript & Sessions:

The ICIEV12 had 393 submissions as full paper from 36 countries, from which 227 papers have been included in the proceedings for presentation after rigorous peer-review process. More than 250 reviewers were engaged for this review process. Though the minimum number of reviewers per manuscript was two, most of the papers were reviewed

by more than two reviewers so that expert comments from reviewers can help the authors to improve the final manuscript upon acceptance. For review management, Microsoft Research CMT was used.

There were 36 oral sessions (three parallel sessions) and 10 interactive poster sessions

All papers are archived in the [IEEE Xplore Digital Library](#).

(IPS). Each IPS had also one Session Chair who evaluated them and decide the best IPS. Apart from these technical sessions, 8 invited speakers from Japan (4), Korea (1), Malaysia (1), India (1) and USA (1) delivered expert talks during the conference.

Three best paper awards, three best presenter awards, and three best interactive poster session awards were offered during the closing ceremony of the conference – with certificates and crests.

Social Programs:

The inauguration ceremony was conducted by the Md. Atiqur Rahman Ahad. A A M S Arefin Siddique, the Vice-Chancellor of the University of Dhaka, Bangladesh, delivered the opening speech of the conference. The Banquet was chaired by Harun-or-Rashid, the Pro-Vice Chancellor, University of Dhaka, Bangladesh, along with Norizaku Ikoma, Program Chair of ICIEV, and A.F.M.

Yusuf Haider, former Pro-Vice Chancellor, University of Dhaka. Apart from several coffee breaks, lunches and banquets were arranged for the attendees to promote social interactions among the participants and many students. Students were free to attend and learn. A great number of students and researches participated in the conference. A special dinner was organized to honor the foreign guests and key committee members by the Vice-Chancellor of University of Dhaka at the premises of his bungalow.

For some authors, special efforts were taken by the committee to find lower priced accommodations (lowest approximately US\$6 per night!) within the university and nearby facilities. About 40 volunteers helped tremendously to support the conference (mostly from the Department of the Applied Physics, Electronics & Communication Engineering, University of Dhaka, and from

the Department of Electrical & Electronic Engineering, Bangladesh University of Engineering & Technology). The ICIEV would like to thank all of them for their tremendous efforts to make this conference a successful one.

ICIEV & Future:

The ICIEV provides vibrant opportunities for researchers, industry practitioners and students to share their research experiences, research results, ideas, review of various aspects and practical development experiences on Informatics, Electronics, Computer Vision and related fields. Through various presentations from peer-reviewed, accepted papers, special talks, and networking, the ICIEV provides avenues to share knowledge, make networks, and develop a community for new researchers based on the experiences of experts. The ICIEV opens doors for challenging research areas for future.



International Conference on Informatics, Electronics & Vision (ICIEV)

17~18 May, 2013 in Dhaka, Bangladesh

The ICIEV 2013 will be held in Dhaka, Bangladesh, from 17~18 May, 2013.

Please visit <http://iciev.org>.

The call for papers in PDF is available in <http://iciev.org/cfpICIEV13.pdf>



CIARP 2012 17th Iberoamerican Congress on Pattern Recognition

Buenos Aires, Argentina
September 3-6, 2012

General Chairs:

Luis Alvarez León and Luis Gómez Déniz
Universidad de Las Palmas de Gran Canaria, Spain

Marta E. Mejail and Julio Jacobo
Universidad de Buenos Aires

<http://www.ciarp.org/xvii/>



by Luis Gómez, Juan Wachs, Julio Jacobo, Marta Mejail and Luis Álvarez

The 17th Iberoamerican Congress on Pattern Recognition (CIARP 2012), was celebrated at the charming Palacio San Martín, Buenos Aires (Argentina). CIARP has been a forum for the exchange of scientific invitations, groundbreaking research and academic experience in the hopes of fostering knowledge sharing and increasing collaboration between computer scientists, engineers, mathematicians and statisticians, all working in pattern recognition and related areas.

This conference was supported by several scientific associations, including: International Association for Pattern Recognition (IAPR), the Cuban Association for Pattern Recognition (ACPR), the Mexican Association for Computer Vision, Neural Computing and Robotics (MACVNR), the Portuguese Association for Pattern Recognition (APRP), the Spanish Association for Pattern Recognition and Image Analysis (AERFAI), the Special Interest Group on Pattern Recognition of the Brazilian Computer Society (SIGPR-SBC), the Chilean Association for Pattern Recognition

(AChiRP) and the Argentine Society for Pattern Recognition (SARP-SADIO).

The [CIARP 2012 Organizing Committee](#) wants to acknowledge the former associations and the conference sponsors for their continuous support through the conference organization.

The CIARP 2012 had national and international attendance and dissemination with papers from 16 nations including Canada, Russia and India.

CIARP 2012 had 172 reviewed papers, from which 34 were accepted for oral presentation and 69 for poster presentation. This represents an increase in papers submitted, accepted and overall selectivity relative to recent CIARP congresses. The review process for the CIARP 2012 was diligent and involved 520 reviews to support the decision process. This includes 100 reviewers who spent significant time and effort in the papers' assessment process. The CIARP 2012 Organizing Committee is grateful to the reviewers and the individuals who assisted



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the organizers in making this conference a top tier leading forum for international scientific exchange. The review process, which was double blind, led to consensus based decisions in most of the submissions. Each paper was revised by at least two reviewers. Papers, for which conflicts of interests (COI) were found, were handled separately with no involvement of organizers or authors who had the COI. The Program Chairs carefully considered all the information available to make the final decisions regarding the acceptance of each work.



(from left) Dra. Maria Elena Buemi, Dr. Luis Gómez, Dr. Pablo Negri (Best paper awarded author, University of Buenos Aires, Argentina), Dra. Marta Mejail

Following the CIARP tradition, the IAPR Best Paper of the Congress was awarded to the paper that showed the most innovative and transforming merit. In this edition of CIARP, the paper “Pedestrian detection using a feature space based on colored level lines”, by Dr. Pablo Negri and Dr. Pablo Lotito received the aforementioned award. The goal of this award is to acknowledge and encourage excellence, originality and innovativeness of new models, methods and techniques with an outstanding theoretical contribution and practical application to the field of pattern

recognition. The choice of the best paper was based on the recommendations received from Program Committee members and the CIARP-IAPR Award Committee’s assessment. This committee, carefully chosen to avoid COIs, evaluated each nominated paper in a second review process, which considered specially the quality of the oral and/or poster presentation. This CIARP-IAPR Award Committee consisted of all the members from the CIARP 2012 Organizing Committee.

Additionally, it is important to remark that all relevant pattern recognition topics were covered through outstanding paper and poster contributions and also through the state-of-the-art keynotes and one academic tutorial. The topic having the most contributions was “Applications of Pattern Recognition” with 76 submissions.

The CIARP 2012 Conference Program was further enhanced by five invited talks by eminent speakers. The first talk was given by [Professor Christian Igel](#) (University of Copenhagen, Denmark), entitled “[Multi-Class Support Vector Machines Revisited](#)” that stressed theoretical and practical foundations of pattern recognition. He also presented an academic tutorial called “[An Introduction to Markov Random Fields with Emphasis on Restricted Boltzmann Machines](#)”. [Professor Liu Zicheng](#) (Microsoft, EEUU) discussed state of the art methods for human activity recognition through a talk

entitled “[Human Activity Recognition with 2D and 3D Cameras](#)”. This talk covered 2D video cameras to the recently developed commodity 3D depth cameras. [Professor Juan Wachs](#) (Regenstrief Center for Healthcare Engineering, School of Industrial Engineering, Purdue University, EEUU), gave a very appealing talk entitled, “[Robot, pass me the scissors! How robots can assist us in the Operating Room](#)”, which presented challenges for robots to work with doctors healthcare settings. the next keynote, was given by [Professor Gabriel Taubin](#) (Brown University, EEUU), “[Smooth Signed Distance Surface Reconstruction and Applications](#)”, focused on describing a new and simple variational formulation for 3D geometry problems. [Dr. Jose Rodríguez-Serrano](#) (Xerox Research Centre Europe, Grenoble, France), gave the talk entitled “[Pattern Recognition in Transportation](#)”, showing the trends in transportation in order to understand what research is likely to be of high relevance in future transportation systems. And, the last but not the least remarkable keynote, “[Optimal Anti-Bayesian Statistical Pattern Recognition](#)” was given by [Professor John Oommen](#) (School of Computer Science, Carleton University, Ottawa, Canada), dealing with the possibility of extracting more useful statistical information using a completely new anti-Bayesian approach.

Authors of the best papers presented at CIARP 2012

will soon be invited to submit an extended version of their papers to be considered for publication in the CIARP 2012 related Special Issues: Pattern Recognition Special Issue on Computer Vision applying Pattern Recognition Techniques, Pattern Recognition Letters Special Issue on Robust Recognition Methods for Multimodal Interaction, Special Issue on Journal of Real Time Image Processing and also for the possible publication in the Image Processing on Line

(IPOL) Journal.

One of the most special moments in CIARP 2012 was the warm homage paid to one of the most outstanding researches in Computer Vision and Pattern Recognition, Professor Jean Serra, who shared with all the participants a very nice and unforgettable talk.

And, of course, in CIARP 2012 there was also place for social events. A sightseeing-city tour to the fascinating city of Buenos

Aires took place at the end of the first day. Following once again the CIARP tradition, on the third day of the Congress the CIARP 2012 Social Dinner took place. This event included Argentina's most famous food, the "asado" (beef) and a spectacular Tango Show.

CIARP 2012 is already history, and now is the time to make plans to attend the 2013 edition of CIARP to be celebrated in Havana city (Cuba). See you there soon!.



General Chairs

[Dr. Nadia Mana](#)—Fondazione Bruno Kessler (FBK), Trento, Italy

[Dr. Friedhelm Schwenker](#)—Univ. of Ulm, Institute of Neural Information Processing, Ulm, Germany

[Dr. Edmondo Trentin](#)—Università di Siena, Dip. di Ingegneria dell'Informazione, Siena, Italy

Local Chairs

[Dr. Oswald Lanz](#)—Fondazione Bruno Kessler (FBK), Trento, Italy

[Stefano Messelodi](#)—Fondazione Bruno Kessler (FBK), Trento, Italy

<http://annpr2012.fbk.eu/>

by Miriam Schmidt and Friedhelm Schwenker

The 5th International Workshop on Artificial Neural Networks in Pattern Recognition (ANNPR 2012) was held at Fondazione Bruno Kessler ([FBK](#)), Trento, Italy.

ANNPR 2012 follows the success of ANNPR 2003 (Florence), ANNPR 2006 (Ulm), ANNPR 2008 (Paris), and

ANNPR 2010 (Cairo). This 5th ANNPR workshop acted as a major forum for international researchers and practitioners working in all areas of neural network and machine learning-based pattern recognition to present and discuss the latest research, results, and ideas.

This year the workshop was supported by the International Neural Network Society ([INNS](#)), the International Association for



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Pattern Recognition (IAPR), the Technical Committees 3 (TC3) of IAPR ("Neural Networks & Computational Intelligence"), and the GIRPR (Gruppo Italiano Ricercatori in Pattern Recognition).

ANNPR 2012 attracted researchers from all around the world. Authors from ten different countries (from Europe, America and Asia) presented their work. More than 30 papers were submitted to ANNPR 2012, each paper was reviewed by two members of the program committee, and 20 papers were selected for presentation at the workshop. The oral sessions covered the topics: data description, learning paradigms/ algorithms (2 sessions), partially supervised learning, applications in biomedics, other applications, feature extraction/ selection.

In addition to the regular talks, three exciting invited talks were given during the workshop program. In his talk "NeuCube EvoSpike Architecture for Spatio-temporal Modelling and Pattern Recognition of Brain Signals" Prof. Dr. Nikola Kasabov (Knowledge Engineering and Discovery Research Institute, Auckland University of Technology, Australia and Institute for Neuroinformatics) presented his results and ideas on how to integrate neural network modules, consisting of various neuronal types and genetic parameters, in a single model in order to help understand the information processing in the brain. Prof. Dr. Günther Palm (Institute of Neural Information Processing, Ulm University, Germany) presented an excellent invited talk entitled "Classifier Fusion with Belief

Functions". He reviewed different practical methods and algorithms to combine classifiers, highlighted their advantages and restrictions, and discussed Dempster's rule of combination in detail. The third invited speaker was Prof. Dr. Marco Gori (Information Engineering Department, University of Siena, Italy). In his exciting talk on "Developmental Vision Agents", he presented ideas on semantic regularization in the context of visual agents.

In addition to the well-organized technical workshop program, the social program was excellent as well: A guided tour through the historical city of Trento closed the first workshop day. After a tasting of local wines and food at the famous "Pisconi cellar", all ANNPR 2012 workshop participants enjoyed a delightful conference dinner at the old castle "Ristorante Castel Toblino" next to the lake Toblino.



IAPR: Then and Now

30 years ago...

Ruzena Bajcsy, University of Pennsylvania, USA, was the Editor of the *IAPR Newsletter*.

Today...

Arjan Kuijper, Fraunhofer IGD, Germany, is the Editor of the *IAPR Newsletter*.

13th International Conference on Frontiers in Handwriting Recognition



Conference Honorary Chair:
[Ching Suen](#) (Canada)

General Chair:
[Sebastiano Impedovo](#) (Italy)

Co-Chair:
[Giuseppe Pirlo](#) (Italy)

<http://www.icfhr2012.uniba.it/index.php>

by Sebastiano Impedovo

The 13th International Conference on Frontiers in Handwriting Recognition, ICFHR 2012, took place at the Porto Giardino “Alpitour – Resort”, Monopoli (Bari), in the sunny region of Apulia, in the South of Italy.

ICFHR 2012 was organized by the University of Bari “Aldo Moro” and the “Rete Puglia” Centre and was sponsored by the Technical Committee ([TC11](#)) of the International Association for Pattern Recognition (IAPR). The scope of ICFHR 2012 covered all areas of online and offline handwriting preprocessing, segmentation, recognition, writer identification and verification for forensic and security issues. Motor models for writing and drawing, human reading models and psychological aspects, document and image retrieval

techniques, multimedia systems, WWW applications, PDA applications etc. were also considered.

The conference received the adherence of the President of the Italian Republic Giorgio Napolitano and the patronage of the Prime Minister Prof. Mario Monti, the Minister of Public Administration and Innovation Dr. Filippo Patroni Griffi, the Minister for Economic Development Dr. Corrado Passera, as well as of local institutions like the Regional Governor Dr. Nichi Vendola, the President of the Province of Bari Dr. Francesco Schittulli, and other local administrations. Many research and academic associations also sponsored the conference as well as several national and multinational companies, such as Google and Hitachi.

For ICFHR 2012, a two-track

program was defined, which included 48 oral presentations and 83 poster presentations. The ICFHR 2012 proceedings were published by the IEEE Computer Society. More than 150 participants from 35 different countries of the five continents attended the conference, making it a great success.

**Proceedings of
ICFHR2012 are
available through
IEEE *Xplore*.**

Additionally, two excellent IAPR invited talks delighted the ICFHR 2012 participants. The invited talk “Strokes Against Stroke – Stroke For Strides” was given by Prof. Rejean Plamondon (École Polytechnique de Montréal, Canada). The invited talk “Evaluating the Probability of Identification in the Forensic

Sciences” was given by Prof. Sargur N. Srihari (University at Buffalo, The State University of New York, USA).



Ceremony of the Gold Medal:
(from left) Prof. Sebastiano Impedovo,
Prof. Ching Yee Suen and Prof. Corrado
Petrocelli

For the first time in the IAPR history, a gold medal was assigned at ICFHR 2012 to one of the best researchers in the world in Pattern Recognition. The gold medal was given to Prof. Ching Yee Suen of the Concordia University for the promotion of Pattern Recognition research at Bari University “Aldo Moro”. Prof. Ching Yee Suen received the gold medal directly from the Chancellor of the University of Bari.

ICFHR 2012 was not only a high quality scientific meeting, it was also enriched by surprises and musical events.

The evening before the beginning of ICFHR 2012, the Provincial Orchestra of Bari welcomed ICFHR 2012 attendees with the amazing Symphony No. 38 (“Prague”) in D Major, by Wolfgang Amadeus Mozart, directed by the conductor Flavio Castignanò.

The Opening Ceremony of the conference started with

a concert by the Gioacchino Ligonzo Orchestra under the direction of the conductor Angelo Schirinzi. This exhilarating concert involved and excited the whole audience with a wide range of well-known Italian music and soundtracks from famous movies. The rendering of the Italian anthem was performed while the participants were in standing ovation.

Another pleasant surprise was the extra tour to Alberobello by night, after an exceptionally tasty dinner of typical food from the Apulia region. All participants were enchanted by the visit to Alberobello with its picturesque “trulli”, small dry-stone houses built without mortar and with a typical conical-shaped roof. The participants enjoyed walking through the narrow streets of Alberobello, taking photos and buying souvenirs.

Castellana Caves was the destination of the second tour. The magnificent grandeur of the caves fascinated the visitors, who were attracted by the beautiful natural sculptures, stalactites and stalagmites, created by nature over millions of years.

After the visit to the caves, the Gala Dinner was offered in the wonderful natural scenario of Polignano a Mare. The participants were welcomed to the delightful banquet with speeches made by the General Chair of the conference, Prof. Sebastiano Impedovo, and the Honorary Chair, Prof. Ching Yee Suen, while they enjoyed not

only the outstanding food, but also the wonderful panorama from the terraces over the sea. During the Gala Dinner, the participants were notified that, after the 14th ICFHR, which will be held in Crete, Greece, the proposal of China had been selected for the 15th ICFHR. Therefore, the 15th ICFHR will be held in Shenzhen, China.

During the last day of the conference, the panel session chaired by Prof. Lambert Schomaker was a stimulating forum to focus on new trends in the field of Handwriting Processing and Recognition. Then Prof. Volker Märgner chaired the competition session. For each one of the four competitions, the organizers were invited to present the specific competition organization, the results and the winners.

Regarding the first competition “ICFHR 2012 - Competition on Recognition of On-line Mathematical Expressions (CROHME 2012)”, organized by H. Mouchère, C. Viard-Gaudin, U. Garain, D. H. Kim and J. H. Kim, the winner was the Vision Objects Company.

For the competition “ICFHR 2012 - Competition on Handwritten Document Image Binarization (H-DIBCO 2012)”, organized by Ioannis Pratikakis, Basilis Gatos and Konstantinos Ntirogiannis, the winner was Nicholas Howe of the Smith College, Department of Computer Science, Northampton (MA), USA.

For the competition

“ICFHR2012 - Competition on Automatic Forensic Signature Verification (4NsigComp 2012)”, organized by Marcus Liwicki, Muhammad Imran Malik, Linda Alewijnsey, Elisa van den Heuvel and Bryan Fount, the winners were V. Nguyen and M. Blumenstein of the School of Information and Communication Technology (ICT) and the Institute for Integrated and Intelligent Systems (IIIS), Griffith University, Australia.

For the competition “ICFHR 2012 - Competition on Writer Identification - Challenge 1: Latin/Greek Documents”, organized by G. Louloudis, B.Gatos and N. Stamatopoulos, the winners were Chawki Djeddi of the LAMIS Laboratory, Mathematics and Computer Science Department, University of Tebessa, Tebessa, Algeria, Labiba Souici – Meslati of the LRI Laboratory, Computer Science Department, Badji Mokhtar, University of Annaba, Annaba, Algeria and Abdellatif Ennaji, LITIS Laboratory, Rouen University, Saint Etienne du Rouvray, Rouen, France.

Finally, for the competition “ICFHR2012 - Competition on Writer Identification - Challenge 2: Arabic Scripts”, organized by Abdel`aali Hassa`ine and Somaya Al Maadeed, the winners were Wei Zhang of the Department of Information Engineering, the Chinese

University of Hong Kong, and also Andrew Newell and Lewis Griffin of the Department of Computer Science, University College London.

Finally, Prof. Sebastiano Impedovo chaired the Award Ceremony. He first introduced Prof. Louisa Lam and Prof. Umapada Pal, who selected the GIRPR Best Student Paper Award. The winner was Abedelkadir Asi for the paper “Layout Analysis for Arabic Historical Document Images Using Machine Learning” (authors: Syed Saqib Bukhari, Thomas Breuel, Abedelkadir Asi and Jihad El-Sana). Successively, Prof. Angelo Marcelli and Prof. Réjean Plamondon declared the IGS Best Student Paper Award, that was given to Jaques Swanepoel for the paper “Writer-specific Dissimilarity Normalisation for Improved Writer-independent Off-line Signature Verification” (authors: Jaques Swanepoel and Johannes Coetzer) and to George Eskander for the paper “Adaption of Writer-Independent Systems for Offline Signature Verification” (authors: George Eskander, Robert Sabourin and Eric Granger). Prof. Masaki Nakagawa and Prof. Bidyut Baran Chaudhuri assigned the IAPR Best Paper Award to the paper “Separability versus Prototypicality in Handwritten Word Retrieval ” (authors: Jean-Paul Van Oosten and

Lambert Schomaker) and the IAPR Best Poster Award to the paper “KHATT: Arabic Offline Handwritten Text Database” (authors: Sabri A. Mahmoud, Irfan Ahmad, Mohammad Alshayeb, Wasfi G. Al-Khatib, Mohammad Tanvir Parvez, Gernot A. Fink, Volker Märgner and Haikal El Abed). Finally, Prof. Giuseppe Pirolo presented the Google Award for the Best PhD student paper according to the selection performed by Dr. Thomas Deselaers and Dr. Daniel Keysers from Google. The winner was Marianela Parodi for the paper “Online Signature Verification Based on Legendre Series Representation. Robustness Assessment of Different Feature Combinations” (authors: Marinela Parodi, Juan Carlos Gomez, Marcus Liwicki).

At the end of the Award Ceremony, Prof. Sebastiano Impedovo closed the ICFHR 2012, thanking all supporting institutions, sponsors, organizers and, in particular, all the participants who made the great success of the 13th ICFHR possible.

On the ICFHR 2012 website (<http://www.icfhr2012.uniba.it>) photos and videos of the conference are available to renew the emotions of the wonderful experience of attending the ICFHR 2012 in the Apulia region.





The 7th IAPR International Conference on Pattern Recognition in Bioinformatics

November 8-10, 2012, Tokyo, Japan

General Chairs

[Jun Sese](#) (Tokyo Tech, Japan)
[Shandar Ahmad](#) (NIBIO, Japan)

Program Chairs

Hisashi Kashima (U Tokyo, Japan)
[Tetsuo Shibuya](#) (U Tokyo, Japan)

<http://prib2012.org/>



by Shandar Ahmad and Jun Sese

The 7th International Conference on “Pattern Recognition in Bioinformatics” was held at Tokyo Institute of Technology, Tokyo, in November, 2012. This meeting was organized as a concurrent event of [21st International Conference on Pattern Recognition](#) held at Tsukuba city, Japan. The previous six PRIB events have been organized in Hong Kong, Singapore, Australia, UK and The Netherlands (2010 and

2011). We are very pleased to thank IAPR for being the main sponsor of the event and for continuing to support PRIB through its technical committee on Bioinformatics ([TC20](#)). We are also very thankful to the Japan Society of Bioinformatics ([JSBi](#)) for being a major sponsor of PRIB 2012 and for the financial support they provided. [Tokyo Institute of Technology](#) provided the logistical support and made the hosting of this meeting possible. Finally, an important breakthrough in making PRIB 2012 live

beyond the physical walls of the auditorium and reaching the larger scientific community was made possible by the Asian Bioinformatics Research and Education Network (ABREN) through recording and post-conference streaming of the presentations made in PRIB 2012.

PRIB 2012 received a very impressive response and was attended by 53 participants from all over the world, including 23 from within Japan. A best paper award was announced and was won by Twan Van



Twan Van Laarhoven receives best poster award from Tetsuo Shibuya, Program Committee Co-chair.

Laarhoven and Elena Marchiori for their paper entitled “Robust Community Detection Methods with Resolution Parameter for Complex Detection in Protein-Protein Interaction Networks”. The authors presented a novel method to address an important biological problem of today. The meeting was organized over three days and 28 full papers were selected for oral presentation. In addition, about a dozen abstracts were selected for poster presentation.

Several members of the PRIB

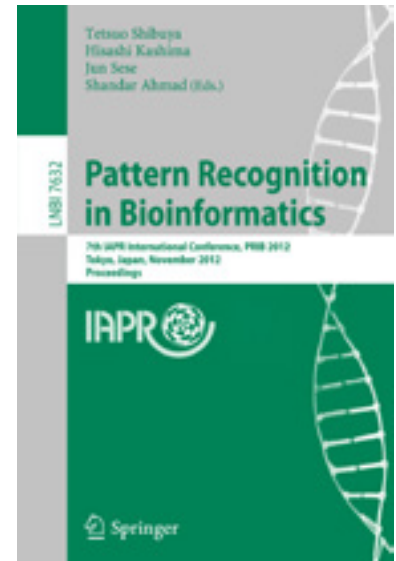
steering committee were also present through the technical sessions and a meeting of IAPR TC20 to discuss future course of action for PRIB was held.

All oral presentations were video-recorded by ABREN technical professionals and were made available to registered users through their website (www.abren.net).

Scientific content of the conference was lavishly hailed by the participants, as state-of-the-art work was presented on diverse topics of pattern recognition techniques applied to Bioinformatics problems. This included papers on classical problems of secondary structure prediction as well as the current and hot subjects of metagenomics, data visualization, and big data issues.

[Key note addresses](#) were delivered by Prof. Hwanjo Yu (Big data in Bioinformatics) from Postech, Korea, Prof. Kwong-Sak Leung (protein-DNA interactions) from The Chinese University of Hong Kong and Prof. Takayuki Aoki (Large-scale stencil applications


using the whole TSUBAME2.0 resources) from Tokyo Institute of Technology. These talks presented an overview of current knowledge state in pattern recognition technology in Bioinformatics and served



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as a great motivation to pursue further research in the field.

Finally the meeting was successfully concluded and the announcement for the next [PRIB \(2013\)](#) was made. The next meeting will be held in Nice, France.



22nd INTERNATIONAL
CONFERENCE ON
PATTERN
RECOGNITION

Submission opens 20 September 2013

The next few pages contain reports on three of the eight [workshops that accompanied ICPR2012](#).

~Arjan Kuijper, EiC

PR4HA: 1st International Workshop on Pattern Recognition for Healthcare Analytics

Workshop Co-chairs:

[Jianying Hu](#), IBM T.J. Watson Research Center
[Faisal Farooq](#), Siemens Medical Solutions USA, Inc.
[Kohichi Takeda](#), IBM Research, Tokyo

<https://sites.google.com/site/pr4healthanalytics/>

In today's environment, the health care industry must balance between the often contradictory goals of cost reduction and improving the quality of care. With growing costs and rising populations comes an inevitable paradigm shift towards accountable care where organizations are focusing on cost reduction, standardized care and quality improvement like never before. In addition, with the information overload in clinical literature coupled with the difficulty in extrapolating evidence from clinical trials to real world settings, providers find it difficult to select appropriate therapy for each patient. It is possible to address many of these challenges by discovering and implementing best practices in health care by analyzing the large amount of available information (extensive electronic health records recording patient conditions, diagnostic tests, labs, imaging exams, genomics, proteomics, treatments,

outcomes, claims, financial records, clinical guidelines and best practices etc.). At the heart of healthcare analytics is the ability to recognize (identify, classify and discover) patterns from the plethora of information available. As such, pattern recognition plays a pivotal role in the future of healthcare, specifically in healthcare analytics.

The objective of the First International Workshop on Pattern Recognition for Healthcare Analytics was to bring together pattern recognition and healthcare researchers interested in healthcare analytics and applications of pattern recognition in this field, to exchange ideas, and to identify important problems, applications and synergies between pattern recognition and healthcare analytics disciplines.

The workshop included 5 lively sessions (2 invited,

3 contributed) attended by researchers from around the world from both industry and academia. The [keynote speeches](#) highlighted two important areas within medical informatics: "Evaluation, Revision and Construction of Clinical Care Plans using Order Histories in Hospital Information System", by Dr. Shusaku Tsumato, Professor of Medical Informatics at Shimane University, and "Text Mining for the Bio-medical Domain: Beyond Information Retrieval", by Dr. Junichi Tsujji, principle researcher of Microsoft Research Asia. The program also included 6 oral and 4 poster presentations, with wide ranging topics including medical event indexing, sensor data analysis, medical image analysis and functional brain network analysis.

The online proceedings of the workshop is available at: <https://sites.google.com/site/pr4healthanalytics/proceedings>.

PRRS: 7th International Workshop on Pattern Recognition in Remote Sensing

Workshop Co-chairs:

Jenny Q. Du (Mississippi State University, USA)

Eckart Michaelson (Fraunhofer IOSB, Germany)

Peijun Du (Nanjing University, China)

The 7th Workshop on Pattern Recognition in Remote Sensing (PRRS 2012) was organized by the Technical Committee 7 (Remote Sensing and Mapping) of the International Association for Pattern Recognition (IAPR), and co-sponsored by IAPR and by IEEE Geoscience and Remote Sensing Society (GRSS). The Program Committee consisted of 27 experts in related areas.

The PRRS Workshop series has established itself as an important event for researchers and practitioners involved in the use of pattern recognition methods in the analysis of data collected from spaceborne and airborne sensors used for Earth observations. As we know, pattern recognition has many important applications

in remote sensing. With large volumes of remote sensing data being acquired from last generation sensors and with image resolutions (e.g., spatial, spectral, temporal) being improved dramatically, it requires further advances of pattern recognition algorithms and techniques. The PRRS Workshop provides an ideal setting to spread and exchange experiences from both communities so that better understanding from theoretical and application aspects can be gained for mutual benefits.

PRRS 2012 followed the tradition and format of the previous PRRS Workshops held in conjunction with ICPR. The 15 papers selected out of 21 submitted and reviewed with a double-blind review

process covered a wide range of topics, including SAR image processing, hyperspectral image processing, segmentation and interpretation, applications of classification and detection.

A keynote presentation was provided by Professor Lorenzo Bruzzone (University of Trento, Italy) on "Novel paradigms for automatic classification of remote sensing images".

The [workshop proceedings](#) have been published in IEEE Xplore. A special issue of the IEEE Journal of Selected Topics in Earth Observations and Remote Sensing will be published in 2014. The related Call-for-Papers will be announced soon.

IAPR: Then and Now

30 years ago...

ICPR 1982, the 6th International Conference on Pattern Recognition, had taken place in October in Munich, Germany.

There were almost 700 participants.

251 papers and 50 posters were presented.

Today...

ICPR 2012, the 21st International Conference on Pattern Recognition, took place in November, in Tsukuba, Science City, Japan.

There were over 1200 participants.

313 papers and 629 posters were presented.

WDIA: International Workshop on Depth Image Analysis

Workshop Co-chairs:

[Xiaoyi Jiang](#), University of Münster, Münster, Germany
[Olga Bellon](#), Universidade Federal do Parana, Curitiba, Brazil
[Dmitry Goldgof](#), University of South Florida, Tampa, USA
[Takeshi Oishi](#), University of Toyko, Toyko, Japan

http://cvpr.uni-muenster.de/WDIA2012/home_page/

The purpose of this workshop was to address the challenges in advanced depth acquisition techniques, processing and analyzing depth data, and to consider novel and challenging applications.

3D depth data has turned out to be a key information source for solving a large number of challenging applications. In the past substantial advances have been demonstrated to process, analyze, and interpret depth data. Meanwhile, depth data play a vital role in areas like biometrics, cultural heritage applications, human action recognition, and 3DTV (e.g. Depth-Based Image Rendering). Through the recent development in consumer depth cameras, in particular the low-cost Kinect, a new era of depth data analysis emerged. Affordable depth cameras are changing the landscape of computer vision and related research fields, with profound impact far beyond consumer electronics. The workshop intended to bring together researchers from multiple subfields to discuss the major research problems and opportunities of the emerging RGBDcamera revolution.

A total of 27 papers were

submitted to the workshop. After a careful review by an international program committee, 16 submissions were selected for the workshop program. The workshop attracted about 45 participants from 17 countries. The participants included researchers working in the field of depth data processing/analysis and researchers working on 3D vision applications.

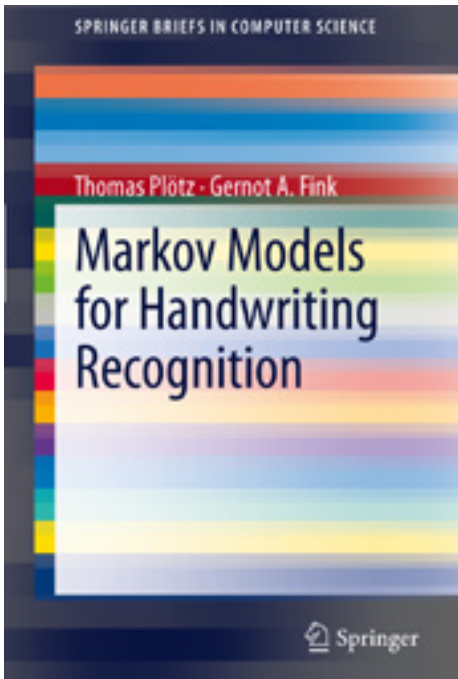
The papers presented at the workshop deal with topics ranging from acquisition of depth data to processing/analysis of depth data and applications. Many of these works have strong practical relevance, as illustrated by the following two examples. Existing approaches to calibration of the Kinect do not take into account the possible influence of thermal and environmental conditions. The paper "Impact of thermal and environmental conditions on the Kinect sensor" by D. Fiedler and H. Müller shows that variations of the temperature and air draft have a notable influence on Kinect's images and range measurements. The authors suggest practical rules for reducing calibration and measurement errors caused by thermal conditions.

The paper "Toward an augmented reality system for violin learning support" by H. Shiino et al. presents an on-going work about a new augmented reality system for training in how to play violin. Based on a Kinect, the real-time solution does not require any specific marker.

All presentation files are available online at the workshop homepage. A post-workshop LNCS book will be published. In addition to the revised versions of the papers, it will also contain two papers giving a summary of ICPR2012 contests "CHALEARN Gesture Challenge" and "Kitchen Scene Context based Gesture Recognition", which are based on depth data.

As follow-up to WDIA2012, a Special Issue on Depth Image Analysis will appear in Pattern Recognition Letters.

BOOKSBOOKSBOOKS



Markov Models for Handwriting Recognition

by Thomas Plötz and Gernot A. Fink
Springer, 2011

Reviewed by [Longlong Ma](#)
(China)

The book provides a general introduction with 75 pages for researchers on handwriting recognition. More contents focus on the handwriting recognition methods based on Markov models, including a recognition framework and techniques within this framework. Firstly, I make a summary for each chapter of this book. Then I give some critical comments.

Chapter 1 outlines the history of Markov models and their application to handwriting recognition.

Chapter 2 gives the general recognition framework for offline handwriting recognition. Each module introduces related methods. Modeling and decoding is only designed for Markov models.

Chapter 3 provides the theoretical concepts behind Markov models. The related definitions and algorithms for Hidden Markov models (HMMs) and n-gram models are described. How to combine these two models is presented as the key part.

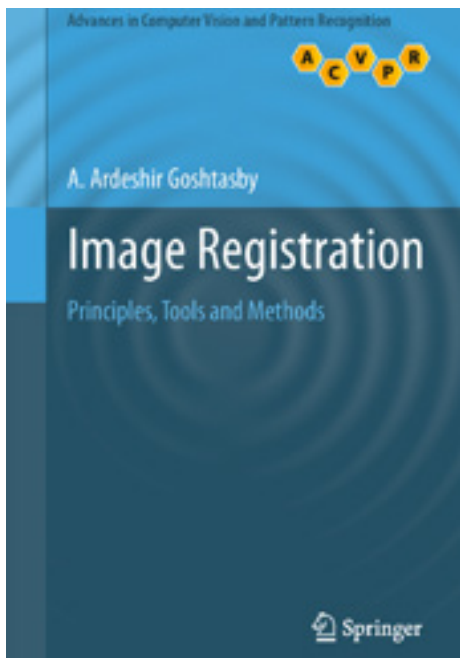
Chapter 4 is the core of the Markov model-based handwriting model. First, the segmentation problem is described from segmentation-free and segmentation-based recognition. Then, many feature extraction methods are discussed followed by the reflection of modeling aspects. Lastly, how to build the writing model and n-gram language model is described. The writing model is built by modeling handwriting data structure and output behavior using HMM. Language models are built from word-based and character-based view.

Chapter 5 describes six datasets and seven major recognition systems.

The last chapter gives a conclusion of the state of art and methodological trends related to the field of handwriting recognition based on Markov models. Some considerable problem and future challenges in this field are also given.

In conclusion this book gives an introduction for researchers on handwriting recognition. I think readers can get some useful information from it. However, there is still some room to be improved. I present several suggestions for reference, as follows:

- (1) The authors should also give details of online recognition methods and discuss if there are any methods with higher recognition accuracy as compared with the offline recognition methods.
- (2) The book is more suitable for researchers who only intend to know basic information. If the authors can provide a more detailed introduction to topics such as feature extraction methods for Markov models etc. I think the readers will benefit a lot more.
- (3) For datasets, there are other notable datasets such as Chinese datasets named CASIA-OLHWDB and CASIA-HWDB, etc. Accordingly, some recognition systems also have been developed. If the authors want to extend the book, they should consider other notable datasets to enrich the content in this part.
- (4) In the integrated recognition framework, geometrical information would be useful to enhance recognition accuracy.



***Image Registration:
Principles, Tools and
Methods***

by A. Ardeshir Goshtasby
Springer, 2012

Reviewed by [Zeeshan Zia](#)
(Switzerland)

Computer vision started out as a sub-field of Artificial Intelligence many decades ago, with the objective of solving a number of “high-level” computer vision problems. However, researchers soon realized that to extract such high-level information from real-world images, they needed to solve quite a few “low-level” sub-tasks, which led to decades of research into methods for performing these tasks. The book *Image Registration: Principles, Tools and Methods* by A. Ardeshir Goshtasby is a detailed reference on many such low-level computer vision sub-tasks. The topics discussed include interest point detectors and descriptors, feature extraction, similarity

and dissimilarity measures, feature selection, interest point matching, robust parameter estimation, transformation functions, image resampling, and image registration. A huge amount of literature, from early developments of many decades ago to very recent works, on these problems is neatly categorized, along with qualitative and quantitative evaluation of the techniques on a few images. The detailed discussions and visualizations of the methods’ results on a handful of images provide insights into their behavior under different conditions (noise, blurring, scale and in-plane rotation variations etc). However, when such evaluations are used to compare different methods (and a significant portion of the book is dedicated to doing just that), I would take the conclusions drawn with a grain of salt, since the test sets are very small, often a single image of a coin and synthetically deformed versions of it. If the evaluations of the methods had been performed on a larger dataset, this would have become an essential “go to” reference for me. Further, there is no mention of any kind of learning based approach to the problems discussed, for example interest point matching by classification, or feature selection by learning, which makes me a bit disappointed. The book provides explicit near-pseudo-code descriptions of some of the algorithms discussed which can be helpful for someone interested in implementing the algorithms. It has a total of 441

pages and is self-contained and easy to read, thus well suited as a reference book for students and practitioners alike.

Since the chapters are fairly independent from each other in terms of content, I review them separately in the following:

Chapter 1: The first chapter is very small, and gives a definition and history of image registration followed by a block diagram for an image registration system, each block of which forms the next chapters.

Chapter 2: The second chapter discusses in detail many similarity and dissimilarity measures (27 in total) in the context of image retrieval and rigid template matching problems, and multiple ways of how some of them are used to tackle different challenges, for example, speeding up correlation coefficient based matching by calculating in the Fourier domain, or robustifying Shannon’s mutual information measure by computing a so-called “high-order” mutual information measure etc. The theoretical discussion and experimental evaluation includes how some of the measures relate to each other, with comparisons of their computational complexity, visualization over a test cases, performance under noisy conditions and under different illuminations, whether or not they are a metric, and their performance with images of different modalities.

Chapter 3: In the third chapter

interest point detectors are categorized into 15 classes (correlation-based, edge-based, model-based, uniqueness-based, curvature-based, and so on) and the important ideas are discussed in chronological order. Further they introduce five new detectors. They also visualize the interest points obtained at a fixed scale for two different images for most of the detector classes discussed. However the size of images is fairly small and thus it is not possible to do any qualitative comparisons by eye. At the end, they evaluate six widely used detectors and five of the newly proposed detectors, for repeatability of the detector, localization accuracy, number of corresponding points, and computation time. They evaluate by comparing the interest points obtained over a single base image of a coin and its deformed versions (applying histogram equalization, in-plane rotation, scaling, affine and homography transformation, addition of noise, and smoothing). The best performing detectors from the evaluations are SIFT and the so-called Laws mask response detector. However in my opinion, the evaluation would be more valuable if it had been performed for a greater number of images, and perhaps if the deformations were real instead of synthetic (picture of the building facade taken from a distance instead of scaling applied to image, camera rotated instead of the image rotated and so on).

Chapter 4: The fourth chapter

lists a large number of image features (122) categorized into 10 classes. After a detailed discussion, they evaluate all of the features over the same set of images as the previous chapter (coin image and its rotated, scaled, blurred, noisy versions) and report the blurring invariance, noise invariance, rotation invariance, scaling invariance and also the corresponding repeatability for the features. Again while the discussion is very useful, I do not think the evaluation is conclusive since for each of the performance measures there is only one example image (one blurred image to calculate blurring invariance!).

“Overall, this book surveys the literature on the topics mentioned above quite well. I am sure it will serve as a useful reference for me in the future...”

Chapter 5: The fifth chapter reviews image descriptors discussing in fair depth all the usual suspects including histogram-based descriptors, SIFT descriptor and some of its variants, spin-image-based, filtering-based, moment-based descriptors as well as combinations of descriptors. They also discuss different similarity and dissimilarity measures between descriptors. I found the discussion that follows, on proposals to

overcome the limitations of SIFT namely reliable estimation of local scale and orientation particularly interesting. Here they propose solutions to estimating the relative rotational and scaling differences between two images without knowledge about the correspondences between interest points. Once these estimates are available, it should be possible to warp one of the images to normalize for the rotational and scaling difference, and obtain a greater number of correct matches.

Chapter 6: Some of the literature on feature selection is surveyed in the sixth chapter, divided into (i) filter algorithms which select features by discarding highly dependent features without considering the final objective (matching rate), and (ii) wrapper algorithms where feature selection takes into consideration the final matching outcome. Finally they perform experiments for matching interest points in a reference image with its modified versions, using subsets of 16 features selected with the Sequential Forward Selection (SFS) algorithm and discuss the outcome.

Chapter 7: The seventh chapter is on establishing correspondences between interest points in two images of a scene. For me personally, this was the most fruitful chapter, because I was not aware of almost anything apart from RANSAC based matching; whereas they not only discuss many variations of RANSAC-class of algorithms, but also survey graph-based matching,

feature-based matching, clustering-based matching, geometric invariants based matching, relaxation-labeling based matching, and spectral-graph based matching etc. At the end, they discuss coarse-to-fine matching by dividing each pyramid level into Voronoi regions, as a solution to matching between large images with local geometric differences.

Chapter 8: The eighth chapter surveys a few specific robust parameter estimation schemes in the context of estimating transformation parameters relating a pair of images from a bunch of noisy point correspondences. The experimental evaluation is mixed up with the discussion and makes for a difficult read. They list the coordinates of all the 100 interest points and their correspondences (found in the same coin images used in the other chapters), as well as the estimated parameter values for the transformation function, whose purpose I failed to

understand. However, it is nice that they address specifically the effect of distant outliers on estimation and discuss that in a separate sub-section.

Chapter 9: The ninth chapter discusses transformation functions that model the geometric relation between the images being registered. It surveys the literature on rigid and adaptive transformation functions in a fair amount of detail followed by evaluation of adaptive transformations on a set of images (6 fairly diverse image pairs). The conclusions are that thin-plate splines (TPS) consistently show the best speed, however there is no clear winner in terms of accuracy among the 10 methods compared.

Chapter 10: This tenth chapter is a small one discussing different schemes for image resampling and mosaicing.

Chapter 11: The eleventh chapter is on image registration methods, categorizing literature

in principle axes registration, multiresolution registration, optimization-based registration, boundary registration and so on, with a focus on medical image registration. I was hoping to see some explicit discussion of important deformable registration methods such as Active Shape/Appearance Models and variational optimization-based approaches that are not covered. The chapter concludes with an interesting section on evaluation measures for registration methods discussing measures of registration accuracy, repeatability, and a gold standard for registration methods.

Overall, this book surveys the literature on the topics mentioned above quite well. I am sure it will serve as a useful reference for me in the future, since I need to do a few of the tasks surveyed, in every project that I work on.

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.

~[Zeeshan Zia](#), IAPR Newsletter Associate Editor for Book Reviews

The following title is available:

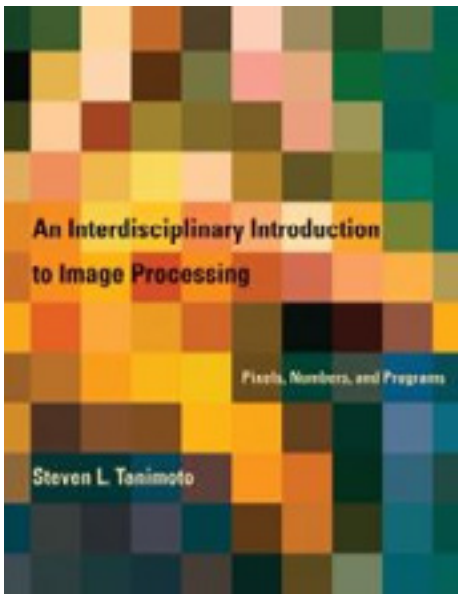


Feature Extraction & Image Processing for Computer Vision
by Mark Nixon and Alberto Aguado

Academic Press, 2012

632 pages

<http://store.elsevier.com/product.jsp?isbn=9780123965493&requestid=80813>



An Interdisciplinary Introduction to Image Processing: Pixels, Numbers, and Programs

by Steven L. Tanimoto

MITP Press, 2012

Reviewed by: [Pramod Kumar Pisharady](#), IHPC, A*STAR, (Singapore)

Overview

The book provides an interdisciplinary introduction, mainly a mathematical and programming perspective, to images and image processing. The book also covers topics like the psychology of perception and artistic applications of image processing. Typically, beginners of this field need a solid background in mathematics and computer programming. The book under review introduces image processing techniques relaxing on this prerequisite. The readers do not necessarily need college-level mathematics or prior programming experience to learn image processing

concepts using this book. The book could act as a good guide to students and beginners in the field.

The book contains 20 chapters divided into two parts, 10 chapters each. The first part (Chapters 1-10) is titled Images and Formulas and discusses the basics of images, their representation and editing. The second part (Chapters 11-20) is titled Images and Programs. It describes the programming of image processing algorithms using Python language and provides the basics of image processing and pattern recognition. A chapter wise review of the book is provided in the following paragraphs.

Part 1: Images and Formulas (Chapters 1-10)

Chapter 1 provides a basic introduction to images and their formation. The chapter answers questions like what an image is, what a function or program is—the questions in the mind of a novice. Definitions of an image from computing, optical, and psychological perspectives are given. In addition, the chapter provides insights to the workings of the human visual system, and relates its functions to image processing operations.

Chapter 2 talks about the representation of digital images using computers and introduces new software PixelMath (open source, available at <http://pixels.cs.washington.edu/>). PixelMath is tailored specifically to teaching image processing basics with its own code and with an interface to Python

programming.

Chapters 3 and 4 elaborate on brightness, contrast and color concepts, and describe the methods to vary these properties. Chapter 4 also discusses the hue, saturation, and value properties of digital images and the conversion between RGB and HSV color spaces.

Chapters 5 and 6 discuss geometric transformations and distortions of images. Chapter 5 explains transformations like rotation and scaling. The difference between push and pull methods is also elaborated. Chapter 6 presents the methods for controlled distortion of images. The methods described include (but are not limited to) perturbations and transformations about Cartesian as well as polar co-ordinates, fisheye transformations, and ripple on a pond effect.

Chapter 7 deals with creation of artificial images. The chapter explains image synthesis methods that use basic mathematical functions. Chapter 7 also presents application of synthetic imaging for the creation of special effects like framing.

Chapter 8 explains the mathematical basis for stereo vision and stereograms. The chapter also discusses autostereogram and its creation using the PixelMath software.

Images within images are classified into four categories and are analyzed in Chapter 9. The four categories

are 1) Steganography, 2) Watermarking, 3) Photomosaics, and 4) Fractals. The chapter defines each of these terms and explains the processing methods to create these images within images.

Chapter 10, which is the last chapter of Part 1, introduces one of the most important image enhancement method, namely image filtering. The chapter describes the methods for and utility of image filtering for applications like noise removal, image analysis, special effects, image compression, and image communication.

Part 2: Images and Programs (Chapters 11-20)

The first 6 chapters of part 2 (Chapters 11 to 16) explain the Python programming language. Chapter 11 introduces the Python interface in PixelMath. The basics of Python (numbers, variables, expressions etc.)

are covered in Chapter 12. The control structures—conditional and repetitive loops—are described in Chapter 13. Chapter 14 explains the data structures: lists, tuples, dictionaries, classes, trees, and graphs. Modular programming using functions is elaborated in Chapter 15. Chapter 16 presents some good practices and design ideas (like object oriented programming) in software development.

Chapter 17 introduces the basic techniques in image processing and analysis. Topics covered include edge detection, contour and line finding, connected component analysis, and morphological operations. Chapter 18 focuses on recognition and classification of image patterns. Methods like K-nearest neighbor classification, perceptrons, and K-means clustering are covered.

Chapter 19 explores techniques in computational photography—the methods utilized in the process of creating digital images from a scene. Chapter 20 concludes the book with selected applications of image processing—morphing and mosaicing. Also, the chapter presents an image matching game called Transcentration, in which a player is asked to match an image with its transformed version.

Exercises and lists of references are provided in all chapters of the book. PixelMath/ Python code is included wherever necessary. Five appendixes are provided in the book helping the reader to quickly refer to PixelMath/ Python formulas and functions, to create graphical user interfaces in PixelMath, and to troubleshoot PixelMath programs.

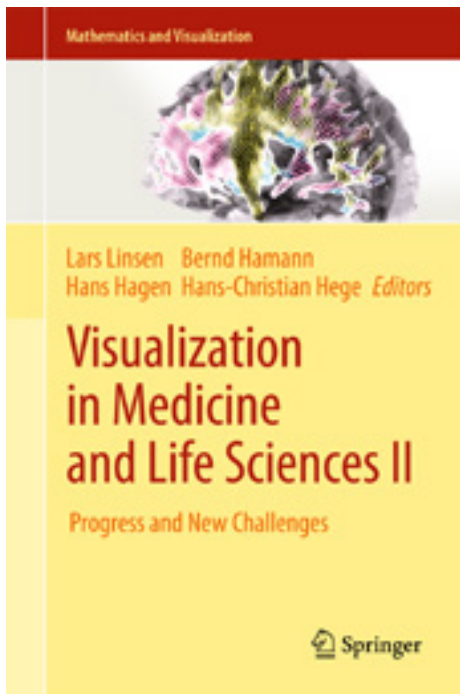
IAPR: Then and Now

30 years ago...

IAPR had 20 member societies from Austria, Belgium, Canada, People's Republic of China, Denmark, Federal Republic of Germany, Finland, France, India, Israel, Italy, Japan, Mexico, The Netherlands, Spain, Sweden, Switzerland, United Kingdom, and USA. In addition, there was a candidate member from Hungary.

Today...

IAPR has 45 member societies from Argentina, Australia, Austria, Belarus, Brazil, Bulgaria, Canada, Chile, China, Cuba, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Iran, Ireland, Israel, Italy, Japan, Korea (South), Macau, Mexico, The Netherlands, New Zealand, Norway, Poland, Portugal, Russian Federation, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, United Kingdom, Uruguay, and USA.



Visualization in Medicine and Life Sciences II:

Progress and New Challenges

By Lars Linsen, Bernd Hamann, Hans Hagen, Hans-Christian Hege Editors
Springer, 2012

Reviewed by [Nicolas Loménie](#) (France)

The book is a collection of fifteen articles covering a broad range of topics related to visualization in medicine and life sciences. It is broken down into five parts that are quite different regarding the scientific and technological approaches. We would have appreciated a global discussion about the international state-of-the-art as discussed in the preface of the book, because the authors are mainly European and most of them from Germany. As the proceedings of a second edition of the workshop VMLS held in 2009, in Bremerhaven, Germany (the first one took place in 2007), we would have

appreciated more references to the works in Book I either by the editors or the authors. Having said that, it is an interesting piece of work as an attempt to fill the gap between various communities such as those publishing in venues like ISBI, ICPR, IEEE Visualization or IEEE Visualization and Computer Graphics. From this perspective we believe it is quite one of a kind and should be very useful for the scientific community of data processing.

The book is organized in five parts: Feature Extraction, Classification, Volumes and Shapes, Tensor Visualization, and Visualizing Genes, Proteins and Molecules. It genuinely proposes a broad overview of topics from basic imaging pipelines to complex systems visualization (like genes). The topic is translational, technology-oriented research. The book in itself gives good references about state-of-the-art issues or software or methodologies, even though they are mostly European-centered. Globally, it is rather inhomogeneous in terms of achievements and state-of-the-art methodology (to us, for example, the third and the fourth articles of Part I are rather basic from an image analysis point of view). Generally, the first papers of each part seem to be related to more mature research works.

One of the major drawbacks of the editing of the book is the quality of image rendering which is quite annoying for a book about visualization (colors in Figure 10 of the first paper

or Figure 11 are very difficult to visualize). Figure 1 of the second paper is not coordinated with the text, and in the same paper, Figure 2 is difficult to interpret. Globally, the authors do not really compare their results to existing methods, even though they reference them.

In the Feature extraction part, we really found the first and the second articles interesting even though the latter seemed to be promoting specific commercial software a bit too much. It would have been nice if the authors had disclosed potential conflicts of interest in the introduction to the book or to their articles.

“All in all, we appreciated the efforts to put together researchers from different communities interested in improving visualization...”

This part deals also with workflow issues and we believe it is one of the assets of the book. In the fourth paper, we missed a conclusion. All in all, this part gives good examples of what is currently needed in terms of applications and software performance for instance.

The Classification part (closer to IAPR interests) presents a nice application of rough sets

(as specific decision trees, to our understanding). Again, Figures 3, 4 and 7 in the first article were not clear to us. The second piece of work about peak finding was not clear to us, but perhaps we are not expert enough in the field. We discovered the notion of “transfer function generator” and it is interesting to learn different terminologies of common techniques depending on the community. We were surprised that the conclusion of the study is merely that the results are not exploitable without further

elaboration.

In the Volume and Shape part, the first article provides an excellent overview about vessel rendering and visualization (including segmentation) and again promotes specific commercial software. The Tensors part was good, especially the first article, though links with more fundamental concepts like regularization might have been appropriate.

All in all, we appreciated the efforts to put together

researchers from different communities interested in improving visualization (from image processing to rendering) to foster innovation in medicine and life sciences. It is worth reading this kind of review for researchers interested in broadening their understanding of the upcoming needs of visualization for life science or for graduate students to understand the new challenges at the crossroads of computer and life sciences.

IAPR: Then and Now

30 years ago...

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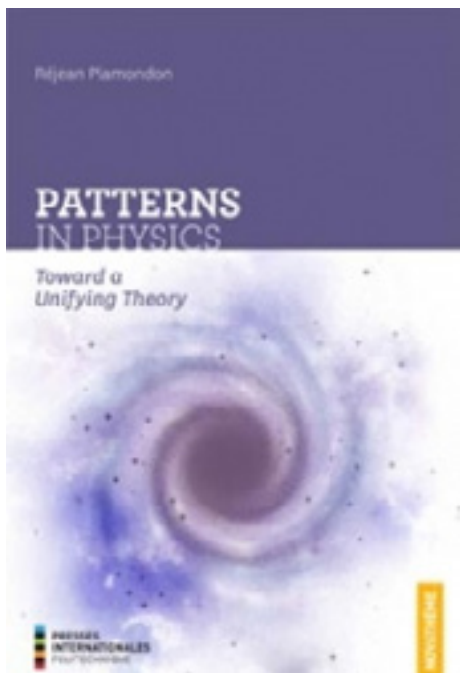
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Patterns in Physics: Toward a Unifying Theory

by Réjean Plamondon
Presses Internationales
Polytechnique, 2012

Reviewed by [George Nagy](#),
IAPR Fellow
Professor Emeritus, Rensselaer
Polytechnic Institute (USA)

This 200-page book is a bold proposal toward a theory based on Bayes' Theorem that provides a new foundation for Relativity and Quantum Physics. Its author, Professor Réjean Plamondon, is well known in the IAPR community for his log-normal neuro-muscular models of handwriting and other small learned motions, for co-founding and co-directing the Unipen Consortium and the International Graphonomics Society, and for his many scholarly articles on handwriting recognition. He also served as CEO of the Polytechnique de Montréal, and he writes delightful poetry.

This work is a radical departure from all of the above. It is based on the analogy that Einstein's 16-dimensional product of the space-curvature tensor and the energy-motion tensor can be viewed as a joint probability. This is justified by the Principle of Interdependence, according to which the two tensors constitute an inextricable information space that defines the observable Universe. To represent an infinitesimal subset of this Universe, the corresponding probability density functions are expressed via Bayes' formula as a ratio of two densities multiplied by a conditional density. The duality between deterministic and probabilistic formulation is resolved by the Principle of Asymptotic Convergence which states that when a physical system consisting of many subsystems can be described—using the Central Limit Theorem—by a multivariate normal function, its constituents can be considered either deterministic or probabilistic without affecting the predictions of the resulting model.

In a macroscopic description, the space-times of each individual particle must be synchronized. Therefore, their probabilities add, which leads to their convolution converging, by virtue of the Central Limit Theorem, to a normal distribution with mean zero and a single covariance parameter sigma. The resulting formulation is integrated to determine the gravitational constant with the parameter sigma set to the appropriate scaling factor

for the Sun. (The No Free Lunch and Ugly Duckling theorems of Pattern Recognition are invoked to explain the seemingly arbitrary choice of the Sun.) The result matches Newton's Square Law for large distances, but includes an erfc (complementary error function) factor that keeps the force from diverging at zero distance. According to the proposed Law, the global gravitational field of the Sun (considered as an ideal static spherically symmetric massive system) has a point of inflection at a radius of 20,000 km on either side of which it decreases smoothly to a value of zero at both zero and infinite radius.

“In summary, what is proposed is a unifying theory that predicts, using various mappings and projections in high-dimensional information spaces, the values of all the physical constants instead of modifying existing theory to accommodate the constants' observed values.”

Starting with the gravitational constant G , Plamondon uses only the single scaling parameter sigma to derive the

speed of light c , the Boltzmann Constant, Avogadro's Number, the Hubble Constant, and the masses of the proton and the electron. The values of many other physical constants, including the Fine Structure Constant and permittivity and permeability of vacuum, are derived further on as well as new equations for the Electrostatic, Weak and Strong forces. The constants are all calculated to nine decimal places to show the slight differences from accepted values. For example, the computation indicates that the speed of light is about 22 km/s lower than its defined value. (It is, of course, the meter that is defined in terms of c , not vice-versa, so perhaps it is the meter that is longer.) Plamondon hypothesizes that the discrepancy may explain known anomalies in computing the trajectory of the Pioneer spacecraft, various orbits near Mars, and the crash of the Mars Polar Lander.

The ϵ_{σ} metric permeates all subsequent calculations and accounts for most of the proposed changes in the values of the constants and potential functions. Importantly, ϵ_{σ} also eliminates all discontinuities and singularities from the various forces and potentials, as illustrated in numerous figures. Extending his model of the solar system to the galaxy and to the entire Universe, Plamondon builds on the lack of singularities to question the existence of black holes and even of the Big Bang.

The new paradigm is applied at scales ranging from the astronomical to the sub-atomic. Most of the quantum-mechanical predictions are based on the error of convergence in the CLT due to a finite rather than infinite number of additive components. Some results are applicable to high-energy Collider experiments. In the chapter dedicated to the very small in contrast to the very large, Plamondon suggests that the putative behavior of tauons on Saturn and of muons on Jupiter is comparable with that of electrons on Earth.

In summary, what is proposed is a unifying theory that predicts, using various mappings and projections in high-dimensional information spaces, the values of all the physical constants instead of modifying existing theory to accommodate the constants' observed values. The theory is supported on three legs: the analogy of a tensor product with a joint probability with multivariate components, the Principle of Interdependence, and the Principle of Asymptotic Convergence. The new paradigm is stated completely enough to be falsifiable and provides concrete, verifiable predictions. In fact, diverse experiments and further explorations of the theory are suggested to validate or reject it.

The narrative is clear throughout and, in places, inspiring. The illustrations, many of which were prepared

by the Maple general relativity software, are excellent. There are 100 references, mostly to classical and contemporary results in physics. A more complete index would be helpful because of the book's structure as an expanding spiral.

If you would enjoy exploring the fundamental nature of the Universe from a pattern recognition perspective and thrive on insights interspersed with page-long equations, this book is for you.

(Disclosure: This book requires far more physics and mathematics than probability or statistics. I was not able to follow either the arguments or the derivations at more than a superficial level because I lack any knowledge of modern physics beyond a 1959 BEng in Engineering Physics. I cannot tell a Covariant from a Contravariant Tensor, a Christoffel Symbol from a Schwarzschild Metric, or a Muon from a Tauon. Nevertheless and perhaps surprisingly, I enjoyed reading Plamondon's astounding revelations.)

INTERNATIONAL CONFERENCE ON
DOCUMENT ANALYSIS AND RECOGNITION (ICDAR)
**CALL FOR PROPOSALS TO HOST
ICDAR2017**

Deadline: June 1, 2013
Submission method: email to
kise@cs.osakafu-u.ac.jp

The ICDAR Advisory Board is seeking proposals to host the 14th International Conference on Document Analysis and Recognition, to be held in 2017 (ICDAR2017).

ICDAR is the premier IAPR event in the field of Document Analysis and Recognition with 300 to 500 participants. The aim of this conference is to bring together international experts to share their experiences and to promote research and development in all areas of Document Analysis and Recognition.

Any consortium interested in making a proposal to host an ICDAR should first familiarise themselves with the "Guidelines for Organizing and Bidding to Host ICDAR" document which is available on the TC10 and TC11 websites (www.iapr-tc10.org and www.iapr-tc11.org, respectively). A link to the most current version of the guidelines appears below:

http://www.iapr-tc11.org/mediawiki/images/ICDAR_Guidelines_2011_04_04.pdf

The submission of a bid implies full agreement with the rules and procedures outlined in that document.

The submitted proposal must define clearly the items specified in the guidelines (Section 5.2).

It has been the tradition that the location of ICDAR conferences follows a rotating schedule among different continents.

ICDAR2011 was held in Beijing, China (Asia), and ICDAR2013 will be held in Washington, DC (the Americas), and ICDAR2015 will be held in Tunis, Tunisia (Europe/Africa). Hence, for ICDAR2017, proposals from Asia are strongly encouraged. However, high quality bids from other locations will also be considered.

Proposals will be examined by the ICDAR Advisory Board. Valid bids will then be presented at the TC10/TC11 joint meeting held during ICDAR2011, where a ballot will be conducted to determine the winning bid.

Proposals should be emailed to Prof. Koichi Kise at kise@cs.osakafu-u.ac.jp by June 1, 2013.

ICDAR Advisory Board

Prof. Jean-Marc Ogier (Chair, TC10)
Prof. Koichi Kise (Chair, TC11)
Prof. Simone Marinai (Chair, IAPR C&M Committee)
Prof. Andreas Dengel (Past Organiser)
Prof. Daniel Lopresti (Past Organiser)

INTERNATIONAL CONFERENCE ON
DOCUMENT ANALYSIS AND RECOGNITION (ICDAR)
**CALL FOR NOMINATIONS FOR
ICDAR2013 AWARDS**

Deadline: May 15, 2013
Submission method: email to
lopresti@cse.lehigh.edu and jean-marc.ogier@univ-lr.fr

The ICDAR Award Program is an established program designed to recognize individuals who have made outstanding contributions to the field of Document Analysis and Recognition in one or more of the following areas:

- o Research
- o Training of students
- o Research/Industry interaction
- o Service to the profession

Every two years, two awards categories are presented. Namely, the IAPR/ICDAR Young Investigator Award (less than 40 years old at the time the award is made), and the IAPR/ICDAR Outstanding Achievements Award. Each award will consist of a token gift and a suitably inscribed certificate. The recipient of the Outstanding Achievements award will be invited to give the opening key note speech at the ICDAR 2013 conference, introduced by the recipient from the previous conference.

Nominations are invited for the ICDAR 2013 Awards in both categories.

The nomination packet should include the following:

1. A nominating letter (1 page) including a brief citation to be included in the certificate.
2. A brief vitae (2 pages) of the nominee highlighting the accomplishments being recognized.
3. Supporting letters (1 page each) from 3 active researchers from at least 3 different countries.

A nomination is usually put forward by a researcher (preferably from a different Institution than the nominee) who is knowledgeable of the scientific achievements of the nominee, and who organizes letters of support.

Submission procedure is strictly confidential, and self nominations are not allowed.

Please send nominations packets electronically to the Awards Committee Co-Chairs Daniel Lopresti lopresti@cse.lehigh.edu and Jean-Marc Ogier jean-marc.ogier@univ-lr.fr. The deadline for receipt of nominations is May 15th, 2013 but early submissions are strongly encouraged.

The final decision will be made by the Awards Committee which is composed of the following members :

Co-Chairs Daniel Lopresti, USA, and Jean-Marc Ogier, France
Dave Doermann, USA
Masakazu Iwamura, Japan
Koichi Kise, Japan
Cheng-Lin Liu, China
Josep Lladós, Spain
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Sargur Srihari, USA
Karl Tombre, France

Meeting and Education Planner

The IAPR web site has the most up-to-date information on IAPR events. Click [here](#).

NOTE: Highlighting indicates that the paper submission deadline has not yet passed.

* Asterisks denote non-IAPR events *

	Meeting	Report	Location
MAY	PSL 2013 : 2nd International Workshop on Partially Supervised Learning	PSL 2011	China
	MCS 2013 : 11th International Conference on Multiple Classifier Systems		China
	GbR 2013 : 9th IAPR TC-15 Workshop on Graph-based Representations in Pattern Recognition	GbR 2011	Austria
	MVA 2013 : 13th IAPR International Conference on Machine Vision Applications	MVA 2011	Japan
	ISMM 2013 : 11th International Symposium on Mathematical Morphology		Sweden
JUN	IDIPS 2013 : International Document Image Processing Summer School		Greece
	ICB 2013 : 6th IEEE/IAPR International Conference on Biometrics	ICB 2012	Spain
	Biometrics 2013 : 10th Summer School for Advanced Studies on Biometrics for Secure Authentication		Italy
	SCIA 2013 : 18th Scandinavian Conference on Image Analysis		Finland
	MCPR 2013 : 5th Mexican Conference on Pattern Recognition	MCPR 2012	Mexico
JUL	* ICIAR 2013 : International Conference on Image Analysis and Recognition *		Portugal
	* MLPRA 2013 : 4th International Workshop on Machine Learning, Pattern Recognition and Applications *		Finland
AUG	ICVSS 2013 : International Computer Vision Summer School: Computer Vision and Machine Learning		Italy
	GREC 2013 : 10th IAPR International Workshop on Graphics Recognition	GREC 2011	USA
	HIP 2013 : 2nd International Workshop on Historical Document Imaging and Processing		USA
	ICDAR 2013 : 12th International Conference on Document Analysis and Recognition	ICDAR 2011	USA
	CAIP 2013 : 15th International Conference on Computer Analysis of Images and Patterns	CAIP 2011	UK
OCT	ICIAP 2013 : 17th International Conference on Image Analysis and Processing	ICIAP 2011	Italy
NOV	PSIVT 2013 : 6th Pacific-Rim Symposium on Image and Video Technology		Mexico
	ACPR 2013 : 17th International Conference on Image Analysis and Processing	ACPR 2011	Japan
	LS 2013 : ISPRS Workshop on Laser Scanning 2013		Turkey
	* CMRT13 : ISPRS Workshop on City Models, Roads and Traffic 2013 *		Turkey
	CIARP 2013 : 18th Iberoamerican Congress on Pattern Recognition	CIARP 2012	Cuba
DEC	PReMI'13 : 5th Int'l Conf. on Pattern Recognition & Machine Intelligence	PReMI'11	India

Meeting and Education Planner (continued)

The IAPR web site has the most up-to-date information on IAPR events. Click [here](#).

NOTE: Highlighting indicates that the paper submission deadline has not yet passed.

* Asterisks denote non-IAPR events *

		Meeting	Report	Location
2014	AUG	S+SSPR 2014 : Joint Workshops on Statistical Techniques in Pattern Recognition (SPR 2014) and Structural and Syntactic Pattern Recognition (SSPR 2014)	S+SSPR2012	Finland
		ICPR 2014 : 22nd International Conference on Pattern Recognition	ICPR 2012	Sweden
	SEP	ICFHR 2014 : 14th International Conference on Frontiers in Handwriting Recognition	ICFHR 2012	Greece

MESSAGE FROM THE PRESIDENT OF IAPR, 1982

After the regrettable divorce from the AI Community, which took place at the IJCAI conference of London in 1971, Profs. K.S. Fu and A. Rosenfeld started an IJCPR conference. It was successfully held in Washington in 1973. A year later, Profs. Verhagen and P. Becker organised the Copenhagen ICPR, starting the alternation between the US and outside: Coronado in '76, Kyoto in '78, Miami in '80, Munich In '82.

A "standing group", headed by Prof. Fu was founded in '74 at Copenhagen, to promote and organise the ICPRs. It was at Coronado in '76 that the principles of IAPR were edicted under the impetus of Profs. Fu, Freeman, and Rosenfeld. The official foundation of IAPR took place on 1/1/78, with the objective of the advancement of theory and practice in the field of PR, and more specifically to organised ICPRs, to publish periodicals, newsletters, and various works.

IAPR is a truly international organisation, supported officially by 19 national groups of specialists in PR. At the recent meeting of the Governing Board in Munich, 5 new groups were admitted: Austria, India, Israel, Spain, Switzerland.

The recent ICPR held in Munich and organised by the West German group headed by Prof. Marko was a real success, as many of us have witnessed: 677 participants, excellent organisation, a really wonderful welcome.

Thus it may be said that IAPR is now an adult and respected organisation, thanks to Prof. Fu, and to the past presidents, Prof. Freeman and Prof. Rosenfeld.

The main objective of organising ICPRs is fulfilled: '84 in Montreal, '86 in Paris are already decided. But the other objectives are either started or starting:

A Newsletter has been successfully started by Prof. Levine, and continued by Prof. R. Bajcay. It has been decided to intensify its scope by nominating a correspondent for Europe: Prof. E. Backer, and a correspondent for Japan: Prof. M. Nagao. We

wish that the IAPR Newsletter will be the medium used by our community to communicate all sorts of interesting information.

A Journal, the PR Letters, proper to IAPR, started by Prof. E. Backer. Anyone may submit a manuscript to this new journal. But we expect that the PR community will consider it as their journal "par excellence". Eric is waiting eagerly for your papers.

Technical Committees (TC), proposed by Prof. Freeman and approved at the meetings of IAPR instances at Munich. [...]

Some other innovations should be noted:

- the introduction of young PR scientists, not elected by their national group, in some "ad hoc" committees. This shows the interes of the "founding fathers" in opening new opportunities for young and brilliant members of our community and to listen to what they may have to say;
- the creation of a committee "publicity and education". This title is, on purpose, somewhat provocative, and my sound like an offense to the dignity of a respectable community. May it recall only the very great necessity to make us known better in different fields. The present situation may be preoccupying: many fields such as CAD or robotics are rediscovering PR, not to speak, of course, of AI! We should make a special to be known outside. We need publiciti! The best way is probably through educational activities, and many thought that to bring together the two trends might be fruitful.

As a wish for this new year, 1983, may I say that I would like to see IAPR expand and innovate along the lines that the former presidents and governing boards have indicated and implemented successfully.

My best personal wishes for a HAPPY NEW YEAR 1983.

J.C. Simon

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President, IAPR