IN THIS Issue

From the Editor's Desk
Publish or Perish—Part 3

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If you have read the previous "From the Editor's Desk" columns, you might feel disillusioned. When all this publishing stuff is getting highly foggy and partially political, where should you submit your papers to?

I apologize for the confusion I might have generated. One motivation for writing these things is to warn you of fake conferences and fake journals – and the grey zone of 'partially fake' ones. There are a lot of good conferences and journals that are worth publishing at/in. When you're working towards your PhD degree, the committee will not look at your publications in terms of numbers that come out of some black box, but they will know the scientific standing.

As Cris Luengo from the Centre for Image Analysis at Uppsala University in Sweden, wrote me:

"It is sad that the Thomson's Journal Impact Factor is used to evaluate individuals, it was never meant for that. Its original purpose was to help librarians select journals to subscribe to. In any case, it does not reflect the reality in our field because it doesn't look at conferences, and it doesn't count citations in conference papers. If you do take these into account, then it turns out that there is a conference that is 'better' than any journal in our field: http://scholar.google.com/citations?view_op=top_venues&hl=en&vq=eng_computervisionpatternrecognition. Good to note that PRLetters does well on this list, as does ICPR."

He's totally right. ☺

And when you look carefully at the list, you'll see that the ones listed are indeed well-known journals and conferences…! A consequence of the overgrowth of journals and conferences is the need for good reviewers submitting good reviews. Unfortunately, this need is not fulfilled. I must confess that as reviewer, I too take into account the standing of the journal or conference, and depending on it I spend more or less time

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

C A L L S
f o r
P A P E R S &
N O M I N A T I O N S

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/*

ICB 2015
The 8th IAPR/IEEE Int'l Conference on Biometrics
Phuket, Thailand
Dates: May 20-22, 2015
Deadline: Nov. 15, 2014

MVA 2015
14th IAPR International Conference on Machine Vision Applications
Tokyo, Japan
Dates: May 18-22, 2015
Deadline: Dec. 12, 2014

ICDAR 2015
13th International Conference on Document Analysis and Recognition
Gammarth, Tunisia
Dates: Aug. 23-26, 2015
Deadline: Jan. 15, 2015

PSIVT 2015
7th Pacific Rim Symposium on Image and Video Technology
Auckland, New Zealand
Dates: Nov. 23-27, 2015
Deadline: Jul. 24, 2015

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on writing a thorough review. This basically has to do with the simple fact that there are too many reviews to be done in too little time. Consequently, 'making your point clear' is extremely important.

In the previous newsletter, Alexander Hermans (see "IAPR... The Next Generation", *IAPR Newsletter*, April 2014) pointed out that "it sometimes seems that it is no longer about getting interesting results, but about selling something." As a consequence "I feel that it can sometimes be hard to compete with senior experts in a field." He concludes with "Furthermore I think that a lot can be learned from discussions with fellow researchers. Especially for us young researchers, a hint from an expert in the field can be very helpful."

I liked that sentence, since my formal job description is "research coach", partially doing what Alexander is asking for. My favorite presentation is entitled "Why I will reject your paper". The feedback I get is indeed positive – because the feedback is given before the submission of the paper. ☺

Perhaps we should have such a track at ICPR and summer schools…..

Suggestions on how to improve this situation?
Mail us!

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IAPR Then and Now: "From the Editor's Desk" 6 Years Ago

From the January 2008 (Vol 30 No. 1) issue of the *IAPR Newsletter*

The (Frustrating) State of Peer Review

by Lawrence O'Gorman (Alcatel-Lucent Bell Labs, USA)
(NOTE: Dr. O'Gorman was at Avaya Labs, Basking Ridge, NJ, USA at the time this article was written)

I've been meaning to write this article for a long time. As an author of technical papers, every time I receive fewer than 3 reviews of one of my submissions, I wonder just how many people were requested to perform the reviews before this minimal number came through in the end. As an associate editor who has served on several editorial boards, every time a request for review is declined or ignored, I wonder if that person is pulling his or her reviewing weight with respect to their own submissions and also with respect to how often this person takes advantage of the whole system of peer reviewed literature. As a program committee member for conferences and workshops, every time I am inundated with from 5 to 20 submissions to be reviewed in a very short time, I wonder why more people aren't sharing this responsibility.

Let me step back a moment to explain, for those who don't know, how papers find their way into journals and conferences. The world of science is built on the foundation of sharing information. The traditional way to do this has been through peer-reviewed scientific publications. (I will not discuss the merits of informal publication through blogs, email, and other non-peer-reviewed publications.) What "peer-review" means here is that, for a submitted article to be published, it must pass the important hurdle of being read and recommended for publication by a number of other knowledgeable people in the field of the submission.

After an author submits a paper to Journal X, the process is the following. The editor-in-chief looks at the paper and decides which of the editorial board members is best qualified to oversee its review. That associate editorial board member then chooses a number of reviewers. The choice of reviewers can be made in several ways. The editor might know one or more experts. Paper references can be scanned to learn other authors in the field. Or, the editor can make use of one of the sophisticated web tools available to publishers today that can access potential reviewers by name, field of expertise, past reviewing for the journal, etc. Through any of these means, reviewers are chosen. The typical minimum is 3. These reviewers are contacted through email. Some may decline, in which case more reviewers are chosen. The reviewers are typically asked to complete the review in 6-8 weeks. When the reviews are received, the associate editor reads them and decides what to advise: the paper can be rejected, accepted, or requested to be revised and resubmitted—in this latter case, the review process is performed again.

There are some differences for a conference submission as compared to that described above. Because of time constraints—time from receipt to accept/reject might be as little as a month—often only program committee members perform the reviews. A minimum of 2 reviews might be acceptable. There is usually no option for "revise and resubmit"; only accept or reject; though perhaps "accept with suggested revisions" is also an option.

So, what is wrong with peer review? Let me first say that this article can be described as only a "flame", that is, I reveal my frustrations, but I don't know the remedies or alternatives. In fact, as frustrating as some aspects of peer review have been to me (and I'm sure to many other authors, reviewers, and editors), the system ultimately works well for readers of these papers. This is because the quality of papers directly correlates with the quality of the peer review process — even as it is today.

My main complaint is a burning suspicion that the task of reviewing is not shared fairly. By fairly, I mean that I think there are an awful lot of authors out there who are not pulling their reviewing weight. It's easy to calculate a fair "reviewing weight". If an author submits n papers per year, then at a 3-reviewers per submission rate, that author should be reviewing 3n papers. We can complicate this a bit by saying that a paper submitted by co-authors reduces the reviewing burden. For example, if author A is a co-author for 3 publications per year, and the average authors per paper is 3, then author A should review 3/3=1 paper that year. (This assumes the co-authors will also review their share, so beginning graduate students without adequate knowledge for reviewing do not count.)

I don't have general statistics on authors not pulling their weight. It's understandable that all of us will have to decline to perform a review at some times due to other commitments. However, if the reason is that the prospective reviewer is too busy writing more of his or her own papers to review others' papers, then I'd say this is an example of an imbalance of the reviewing load. Table 1 shows some reviewing statistics. This is a small sampling of reviews requested for IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), and I make no claims that this represents broader statistics for TPAMI or any other journal. The table shows that about 16% of requested reviewers decline immediately upon request. Of the 84% who agree to perform a review, only 74% actually complete it. Of all requested reviewers, the percentage of completed reviews is only 62%. What this means is that, for every paper needing at least 3 completed reviews, 3/0.62 = 4.8 reviewers must be requested. If these statistics are representative, editors should be requesting about 5 reviews per paper to likely receive 3.

Table 1 Review statistics for a small sample of TPAMI submissions.

	Requested	Declined	Agreed	Completed
number	77	12	65	48
percentage		5.7	84.4	62.3 (of requested) 73.8 (of agreed)

Let's consider other reasons a prospective reviewers might decline. One is that they do not have expertise in the exact field of the paper. I suggest that this explanation is valid only up to a certain point. If the field mismatch is large, this is legitimate. However, if reviewers decline because they are not doing extremely similar work to the submission, then this may be more of an excuse than a valid reason. I say this because of the following points. 1) The paper has at least 3 reviewers, so the complement of each of these can provide adequate coverage of the paper, despite less than 100% expertise overlap of each. 2) Although a prospective reviewer may not have worked on the same problem, any good scientist should know the fundamentals of technical experimentation and publication, and so can assess the clarity of writing, depth of background material, quality of experimentation, and soundness of conclusions. 3) Most review forms have a space for reviewers to enter how well acquainted they are with the field, so the editor can take into account this when assessing the review.

Another frustration is the following. Consider a technical field, XYZ. This field is small, having only 10 or so researchers who publish, and thus who are visible to review submissions. When a paper is submitted in this field, the editor finds 3 XYZ-experts to review it. Because these few people are reviewing papers within their own small group, several problems can occur. A minority of researchers in XYZ who approach a problem differently may never have their work accepted by the status quo majority. Alternatively, if the submitting authors are respected "incumbents", any submission regardless of merit might gain publication acceptance by group members/reviewers. Indeed, a recent article in Science Magazine [1] recognized that, "Teams publishing in high-impact journals have a high fraction of incumbents." However, this article goes on to say, "The temptation to work mainly with friends will eventually hurt performance."

But I think he worst consequence of peer review in this small XYZ community is the following. The few researchers always accept other submissions in the field because they believe their field is worthy of publication. This might be so, but a small field can indicate one of the following: 1) the field is new and set to grow, 2) the field has shrunk and these are the remaining researchers in a field perhaps past its time, 3) the field size remains static over many years, indicating little interest in it outside of the small community. I suggest that options 2 and 3 are problems that inbred peer review will not reveal, thus papers will continue to be published in broad-audience publications despite very small interest in those papers.

As I'vesaid, despite these problems, I believe most good work is published and most peer-reviewed published work is good. If you disagree with this statement or any frustrations I've shared, or just wish to add other comments, please send email and – with minimal peer review – these opinions can be published and shared with other readers.

References:[1] Albert-Laszlo Barabasi, "Network Theory – the Emergence of the Creative Enterprise," Science Magazine, Vol. 308, 29 April 2005, pp. 639-641.

Getting to know…
Réjean Plamondon, IAPR Fellow

No straight lines: writing my own story

by [Réjean Plamondon](#), IAPR Fellow

Réjean Plamondon, IAPR Fellow

ICPR 1994, Jerusalem

For contributions to handwriting and document recognition and service to the IAPR

Once upon a time

I did my bachelor's degree in physics at Université Laval, Québec, with a strong interest in theoretical and fundamental problems. I had hesitated between becoming a writer, a biologist and a physicist. I eliminated writing on the basis that I did not need to study literature to write poetry, and I opted for physics because I thought, at the time, that physics was the most fundamental science – more mature than biology, and at the root of all of our knowledge. At the end of my degree, the opportunities in theoretical physics were not so attractive. I got scholarships for a master's and then a Ph.D. in electrical engineering at the same university, in a research centre that focused on studying bioelectric phenomena in various animals. For me, this was a very interesting way to partly return to my earlier interest in biology. My principal supervisor, Simon Gagné, suggested that I work on vision by studying perception in bullfrog retinas. The goal was to record intracellular potentials in the photoreceptors. I started by implementing new techniques to design glass microelectrodes.

Réjean Plamondon received a B.Sc. degree in Physics, and M.Sc.A. and Ph.D. degrees in Electrical Engineering from Université Laval, Québec, Canada in 1973, 1975 and 1978 respectively. In 1978, he joined the faculty of the École Polytechnique de Montréal, where he is currently a Full Professor. He was the Head of the Department of Electrical and Computer Engineering from 1996 to 1998 and the President of École Polytechnique from 1998 to 2002. He is now the Head of the Laboratoire Scribens at this institution.

Along the various stages of his career, he has been involved in many pattern recognition projects, particularly in the field of on-line and off-line handwriting analysis and processing. His main contribution has been the development of a kinematic theory of rapid human movements which takes into account the major psychophysical phenomena reported in studies dealing with fast movements. In the last twelve years, he has also been working on the generalization of his neuromuscular investigations to study other emerging phenomena in physical systems, mainly focussing on the unification of physics. He recently expounded his cohesive line of research in "Strokes against Stroke, Strokes for Strides, Pattern Recognition, 47(3), 929-944.

Fellow of the NIAS (1989), of the IAPR (1994) and of the IEEE (2000), Professor Plamondon has been involved in the planning and organization of numerous international conferences and workshops and has worked with scientists from many countries. He is the author or co-author of more than 300 publications and owner of four patents. He has edited or co-edited four books and several Special Issues of scientific journals. He has also published a children book, a novel and three collections of poems.

He received the IAPR/ICDAR 2013 outstanding achievement award for "theoretical contributions to the understanding of human movement and its applications to signature verification, handwriting recognition, instruction, and health assessment, and for promoting on-line document processing in numerous multidisciplinary fields".

This led me to pick up where my supervisor's previous studies had left off and develop electrical models that could be used to predict the electrodes' electrical properties and their impact on bio-signal recordings. Meanwhile, I also collaborated on designing

a microprocessor-controlled optical stimulator and mastered retina dissection in a dark room using infrared microscopy. After many months of trial and error, I could use the new electrodes to record potentials in various cells of the frog retinas. Everything was in place to start my perception research, but my second supervisor, Denis Poussart, said I had already published a sufficient number of journal papers about microelectrode modelling and recording to finish writing my thesis.

Before the end of my Ph.D., I was invited to apply for a tenure track position in electrical engineering at École Polytechnique, and got an offer from the department with one condition: I had to enter a new research field, and move away from biomedical engineering. I had to cut my ties with the past! I also had to teach electronics.

I wasn't really happy to see what I might end up turning into. Over time, at the speed at which the microprocessor technology was evolving, I would have had to become a living data book on microprocessor characteristics. Electronic engineering was very tough for a man aiming at long term goals. Everything moved so fast; I couldn't find satisfaction in such a rapidly changing technical world. So I started looking for new research fields that were indirectly linked to electronics but more oriented toward system design and design methodology.

One day I had the idea of putting an accelerometer on a pen to look at the signals while I was writing and signing my name. There were typical patterns associated with the different letters and the signature signals were quite reproducible. Maybe I could design a system that would recognize handwriting and verify signatures?

The plot thickens

I started investigating these engineering problems and found out that there was a dynamic community of researchers working on pattern recognition: the IAPR. Not really knowing what this was all about, I attended the 5th IAPR conference in Miami, in December 1980, and discovered a brand new world full of promise. There was a Canadian, a Montréaler, working on off-line character recognition. I had the opportunity to talk with him briefly. His name was Ching Suen. When I returned from the conference, I launched the Laboratoire Scribens and started supervising graduate students. The name "Scribens," which means "while we are writing" in Latin, perfectly described my vision at the time: "What can we do with a computer while we are writing?" In 1984, the 7th ICPR was held in Montréal, and my students and I presented papers on signature verification with our accelerometer pens. Jean-Claude Simon attended my talk. At the end, he approached me in his typical direct way: "Plamondon, great talk! Do you know Guy Lorette? He's working on signatures too and he's here. Come with me, I'll introduce him to you." I replied, "Yes, Sir!"

In 1985-86, I spent my first sabbatical partly with Ching Suen at Concordia University, working on thinning algorithm evaluation and benchmarking, and partly with Guy Lorette on signature verification, writing our seminal 1989 survey paper. I also discovered a new group led by Arnold Thomassen in Nijmegen, and started working closely with Lambert Schomaker, a Ph.D. student, and Frans Maarse, an engineer, on handwriting modelling. By that time, I was convinced that any breakthrough in handwriting would require a better understanding of the neuromotor

control systems involved in the writing task – an indirect return to my biomedical interests.

In 1985 I was also involved in the launch of the International Graphonomics Society in Hong Kong. I soon agreed to organize the next conference, the first multidisciplinary conference dedicated to handwriting analysis in Montréal. It was held in 1987, and sponsored by the IGS and the IEEE. It brought together not only psychologists and neuroscientists but also researchers from computer sciences, education, forensic sciences and robotics. I have been involved in IGS since then, as a board member, president, and participant at all the biennial conferences.

Elected chair of TC-11 in 1988, succeeding Jean-Claude Simon, I played a political role in coordinating the emergence of the two major conferences in our field: IWFHR in 1990 and ICDAR in 1991. I established the democratic tradition of having all of our community's members vote to select the site and the organizing team for the upcoming conferences. I also contributed to the development of the French-language ICDAR community by the promoting, with many French-speaking colleagues, the establishment of the CNED/CIFED conferences for francophones in the field. With Isabelle Guyon and Lambert Schomaker, I was also involved in creating the Unipen Foundation, in charge of building the first large online database available for benchmarking tests.

In 1989, I was appointed a Fellow of the Netherland Institute for Advanced Study. I spent a year with an international group of neuroscientists, led by Arnold Thomassen, working on the modelling and understanding of human movements. This is

where the seed for my lognormal theory emerged. I completed this investigation during my second sabbatical, of which I spent half the time in Boston, with Steve Grossberg, and half the time in Marseille with Jean Requin, while still maintaining ties in Montréal at Cenparmi, with Ching Suen.

In 1994, at the 12th ICPR in Jerusalem, I was selected to be among the first-ever cohort of IAPR fellows.

My first papers on the Kinematic Theory were published in 1995. After my TC mandate that same year, I was named chair of the IAPR Conferences & Meetings Committee, where, until 1998, I coordinated the TC-1, -2, -10 and -11 activities to stimulate the expansion of the ICDAR community within IAPR. Over the years, I have been involved in the organization of all IWFHR/ICFHR, ICDAR, and IGS conferences (except for the period when I was President of École Polytechnique), sometimes as a member of the program committee but often with bigger roles (general co-chair IWFHR 1994; general co-chair ICDAR 1995, ICDAR 2001 and ICPR 2002; general chair, CIFED 1998) as well as a regular keynote speaker (recently at CIFED 2008, ICPR 2008, ICFHR 2010, ICFHR 2012 and ICDAR 2013). I rang in the new millennium by being appointed as a Fellow of the IEEE. Around that same time, Sargur Srihari and I published our influential survey paper on handwriting recognition. More recently, I have also been involved in various IAPR committees (the J. K. Aggarwal Prize Committee and the ICPR Liaison Committee).

A grand adventure... in research: the fundamental vs the fleeting

My main fundamental contribution to the field has been the development of the Kinematic Theory that uses a family of lognormal equations to describe the majority of psychophysical phenomena reported in the last century on rapid human movements. Slowly but surely, I became a leader in the fields of analysis and processing of on-line and off-line handwriting. Studying and modeling the emergent properties of neuromotor systems involved in the generation of human motions, I worked with numerous collaborators and students to propose innovative solutions to technical problems for the design of automated systems for signature verification and handwriting recognition as well as interactive tools to help children learning to write. Here are a few examples: the design of psychophysical test protocols for handwriting analysis, the use of lognormal models to segment handwriting trajectories into hidden strokes, word thinning by line following, the definition of a signature complexity index, the use of human subjects to standardize the evaluation of thinning algorithms, the segmentation of signatures at perceptually important points, the development of intrinsic regional correlation for on-line signature verification, the implementation of a fuzzy syntactic approach for on-line word recognition, the use of syntactic knowledge to improve on-line recognizer performances, exploiting a filiformity model to extract signatures from bank cheques, the use of motor control information to recover stroke order in handwritten words, a combinatorial approach to train HMM for handwriting recognition, and the use of lognormal letter models to train children learning handwriting.

Over the years, my graduate students and I have designed a family of lognormal parameter extractors to investigate handwriting generation and developed robust methods for the analysis and interpretation of neuromuscular information from handwriting kinematic signals to characterize the fine motor skills in healthy people or patients suffering from various diseases. The theory has been successfully used to characterize the essential properties of the velocity profiles of the fingers, wrist, head and eye movements, and its main physiological hypotheses have been verified using EEG and EMG techniques. These software packages are now in use in labs all over the world for a wide range of projects, from generating large databases of synthetic words or signatures to evaluating recognition and verification systems, and from characterizing Parkinson's disease to calibrating kindergarten students' motricity. At Scribens, the whole methodology was recently extended to assess brain stroke risk factors and to evaluate writer aging phenomena.

Last year, I received the ICDAR/IAPR Outstanding Achievement Award for "theoretical contributions to the understanding of human movement and its applications to signature verification, handwriting recognition, instruction, and health assessment, and for promoting on-line document processing in numerous multidisciplinary fields."

Living happily ever after

In 2002, at the end of my term as President of École Polytechnique, I took an administrative sabbatical, mostly working at home, to come back to my first love: physics. Since then, I have been working a few hours a day, every day, on the unification of general relativity and quantum mechanics. My 2005-2006 sabbatical was also dedicated to this quest. As

a synthesis of my works in this area, in June 2012 I published a book entitled *Patterns in Physics: Toward a Unifying Theory* with Presses Internationales Polytechnique (see a review of this book in the). In the book, I develop the idea that the four fundamental interactions of physics, considered as empirical facts, can be viewed as emergent phenomena described by specific patterns. Similarly, according to this model, the fundamental constants of Nature can be seen as patterns whose numerical values can be predicted. The main argument is based on two principles: the principles of interdependence and of asymptotic congruence. The methodology put forward operates under the central limit theorem and Bayes' law. In this context, physics becomes a problem of statistical pattern recognition, which I now consider to be at the root of our knowledge and which can be seen, in this respect, as one of the most fundamental sciences.

Nowadays, I am more and more involved in the biomedical applications of handwriting through international collaborations that I began when I travelled around the world during my 2012-2013 sabbatical. As well, I am still obsessed by my Holy Grail quest in physics.

How do I survive? Well, during all the years I've spent studying the neuromotor processes involved in handwriting, I've also taken great pleasure in the act of writing itself. I have found some peace in my spare time continuously taking notes in my orange notebook about every spark of an idea that comes to mind. So far I have published a children's book about a magic pencil with my wife Lise Ouellet, a short story about computer fraud carried out by the

nefarious use of an automatic signature verification system, and three collections of poems. I've also taken part in poetry festivals and related projects.

Another survival strategy, for me, has been to swim every day, currently two kilometres a day. I have two goals that are a bit crazy: one, to swim in every sea and ocean in the world (which I'll probably never manage to do!), and the other, to swim around the world at the 45th parallel, the latitude on which I was born (which I'm just about to achieve).

In all that I have done, I can see an epic struggle play out. My passion for that which is lasting – for eternity, whether contained in a law of Nature or in a poem – has been continually challenged by the attraction of short-term technical accomplishments that provide fast results which are often short-lived. I haven't traveled in a straight line. Far from it; my journey has been full of detours, and I've gone off the beaten path. But at every turn, I've let my intuition and emotions guide me through the vagaries of chance and the opportunities life has brought my way. Sometimes we make choices that seem to lead us away from our goals, but life keeps us on the right path.

The characters

Looking back, I think I'm lucky that I never traveled in straight line. Each detour gave me the opportunity to learn new ways of seeing things and to meet new people. As I made these detours, I split my efforts between my dream of permanent fundamental discoveries and the fleeting thrills of technical accomplishments. But I have always had the strange feeling that through line would bring me back to where I started. That through line has been handwriting, in all its facets. Some

would call it destiny. I prefer to think of it as a story of collegial relationships that, luckily for me, have very often turned into friendships, some of them lasting well beyond the recognition of the research work we did together. I would like to conclude this tale by warmly acknowledging the many esteemed colleagues and valued friends who have taken steps with me along this journey, some of whom have walked with me a very long way. To all of them, I wish their life to be guided by the most fundamental principle that I have found so far:

Absolute Relativity

Any body

that beats

in the rhythm

of happiness

holds back

the flight

of his hours
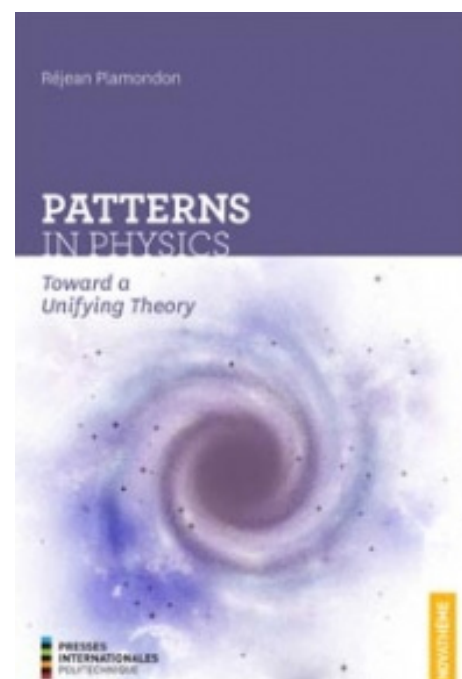
IAPR...The Next Generation

In this series of Feature Articles, the IAPR Newsletter asks 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 **Sébastien Eskenazi**, Laboratoire Informatique, Image et Interaction (L3i), Université la Rochelle, France

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

I got involved in the field of pattern recognition through the prism of document security. Originally, I graduated as an aeronautical engineer. I started web programming a few years ago, which made me very aware of security issues. At the same time, digital content piracy reinforced the feeling that there are serious security issues in the digital world. This is how I started thinking about watermarking solutions for programs or any other digital content.

I was a high school math teacher, but at one point I had enough of it. I needed a job where I could work full throttle without any boundary. What we would call in French a brain défouloir. And a thesis is actually about going beyond boundaries. Then I found a thesis offer on document security at the University of La Rochelle. This appeared to be a good way to broaden my competencies especially as I had already some

ideas on the topic. A brief interview with my future PhD supervisors (Jean-Marc Ogier and Petra Gomez-Krämer) rapidly convinced me this was the thing to do.

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

My main focus is on how to create a digital signature that would work for a document independently from how it has been captured. This is basically the equivalent of a hash algorithm for content that is not exclusively digital. The goal is to authenticate a document even if it has been faxed, photocopied or captured by any other means, including the digital version of the document.

The main idea behind this signature is to extract all the

Sébastien graduated from ENSICA as an aeronautical engineer in 2009. After that, he spent 6 months in Australia and started a career as a high school math teacher when he came back to France. He then made a career change and started a PhD at the University of La Rochelle. During the beginning of his career, he led a student engineering team for CNES (the French space agency), he worked as a product management intern at Dassault Systèmes, he worked on the creation of a hotel business, and he participated in the French presidential election of 2012. More recently he wrote an article on investment strategies for the future that will be published in the Rencontres économiques d'Aix en Provence. He won the Best Paper award at IDIPS and he will present an article at the International Workshop on Computational Forensics as part of ICPR 2014.
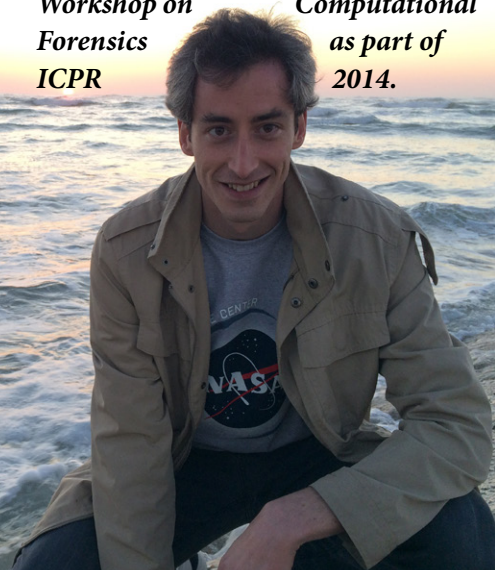
semantic content of the document and then make an appropriate hash of it. Here "semantic content" has a special meaning. It is used opposite to the usual process of a hash algorithm in which raw bits of data are used to compute the hash signature. Hence the semantic content is not the content tagged with a reading order or its role in the page such as a header. It is the transcription of the visually meaningful part of the document such as the plain text, the images, the signatures, the stamps, etc. with their positions.

This leads to several new challenges and the main one (that I started presenting at IDIPS and that I will present at ICPR's IWCF) was the robustness of document analysis algorithms. While doing the tests, I discovered that an OCR processor such as Tesseract does not always produce the same results for the same document. We tested it on extremely clean documents at a high resolution but it was not sufficient. Moreover there has never been a quantitative evaluation of the robustness of document analysis algorithms. We have uncovered a very exciting and completely new way of looking at this field of research.

Our approach to evaluate the robustness of the algorithm was to print a set of texts with several fonts, font parameters and printers and scan them with several scanners at several resolutions. We then ran Tesseract on the document images and finally computed the probability of having different output for the same text. Depending on what we considered to be text, this probability of false positives ranged between 53% and 92%. None of these figures is anywhere near sufficient for a high throughput security application.

A document is not just plain text, so while I continue my research on text processing I will also move ahead with the study of the robustness of segmentation algorithms. Once again everything remains to be done for that and it may open new solutions for text processing.

In the time I can spare away from this main topic, I am also interested in synthetic images and their comparison with real images from an applicative point of view. Basically, can we make synthetic images that will produce the same results as real images when we run an algorithm such as an OCR on them? This is a very different and interesting topic with once again a new evaluation method.

Finally, I would like to say that this work was done with the help of my two really great supervisors that I hereby thank for it.

How can the IAPR help young researchers?

Any young researcher—and probably any researcher at all—will tell you they don't have enough time. One way to help save time would be to have all the algorithms that are used for a publication stored somewhere in an IAPR repository. It would also need to include their requirements in terms of software, library and the versions of each of these and the default or best setting for their parameters. This would save huge amounts of time trying to access someone's code, to reproduce it, to make it work or to tune its parameters.

Something that is already done and that is extremely valuable is the organization of summer schools like IDIPS. This was a unique chance to have a thorough overview of the state of the art in the field of document analysis. It was the chance to meet people with long experience in the field and to get from them some interesting and useful advice on our work. I definitely recommend it to other PhD students and I do hope that the IAPR will continue supporting it.
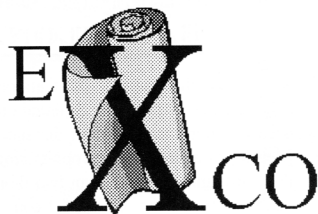
From the EXCO

K.-S. Fu Prize 2014 awarded to Professor Jitendra Malik

It is our pleasure to announce that the recipient of the King-Sun Fu Prize 2014 is Professor Jitendra Malik, University of California at Berkeley, USA

The citation for the prize is:

"For contributions to fundamental algorithms and their theoretical underpinnings in computer vision"

Professor Malik will receive his prize at the ICPR 2014 that will take place in Stockholm on August 25-28, 2014. The K.-S. Fu ceremony and lecture will be presented during the ICPR 2014 opening ceremony.

Congratulations to Professor Malik on this prestigious achievement.

Ingela Nyström
IAPR Secretary

IAPR Then and Now...the first K.S. Fu Award

from the IAPR Newsletter *December 1986, Vol. 9 No. 2*

KING-SUN FU MEMORIAL AWARD

The following resolution was recently approved by the Governing Board to honor the memory of Professor King-Sun Fu. Professor Fu, probably more than anyon eelse, was responsible for founding of IAPR. He served as its first president and is widely recognised for his extensive contributions to the field of pattern recognition.

"PROPOSED that IAPR set up, as a permanent memorial to the late Professor King-Sun Fu, an award to be named the KING-SUN FU AWARD, to be awarded biennially to a living person in recognition of outstanding contributions to the field of pattern recognition. [...]"

from the IAPR Newsletter *December 1988, Vol. 11 No. 4*

KING SUN FU AWARD 1988

Brussels, 25 October 1988
It is my greatest honour and my pleasure to hereby announce that the IAPR Governing Board, upon recommendationfrom the IAPR Award Committee has decided to award the King Sun Fu Award for 1988 to Proffessor Azriel Rosenfeld, University of Maryland. The citation for the award is as follows: "for fundamental contributiona to image analysis, pattern recognition and computer vision". The award consists of an inscribed certificate and a cash gift from the K. S. Fu award fund and will be presented to Profeesor A Rosenfeld on 16th November 1988, at the 9th InternationalConference on Pattern Recognition, Rome, Italy.

Pierre A Devijver
President IAPR

Meeting Reports
Conferences, Workshops & Summer Schools

IWBF 2014

2nd International Workshop on Biometrics and Forensics

Valletta, Malta
March 27-28, 2014
www.um.edu.mt/events/iwbf2014/index.html

Honorary Chair:
Tieniu Tan (Chinese Academy of Science, China)

General Chair:
Reuben Farrugia (University of Malta, Malta)

General Co-Chairs:
Joanna Vella (University of Malta, Malta)
Raymond Cassar (Malta Police Force, Malta)

by Joanna Vella, General Co-Chair

More than 70 participants from 30 different Countries attended IWBF 2014. The workshop was opened by the Commissioner of Police.

It was organized by the European Co-operation in Science and Technology (COST) Action IC1106 "Integrating Biometrics and Forensics for the Digital Age" and the International Association for Pattern Recognition (IAPR) TC4 in collaboration with the Malta Council for Science and Technology, the University of Malta and the Malta Police Force.

The workshop was co-sponsored by the Institute of Electrical and Electronics Engineers (IEEE), International Association of Pattern Recognition (IAPR), Institution of Engineering and Technology (IET), European Association for Signal Processing (EURASIP) and European Association for Biometrics (EAB).

42 papers were submitted to IWBF2014 of which 27 papers were selected and included in the technical program. 17 papers were accepted for oral and 11 for poster presentations. This represents an increase in papers submitted and accepted relative to the first IWBF2013. The acceptance rate was 64.3%. The Program Chairs agreed on a distribution of the submitted papers to 34 reviewers according to their expertise. The whole process was conducted single blind in Microsoft CMT with three reviewers per paper. Review assignment and final decision was made by the different Program Chairs, who selected papers based on the reviewer's reports. Papers judged not to be novel or of high quality were rejected.

The papers will be made available in IEEE Xplore. Authors of the best papers presented at the workshop were invited to submit an extended and updated version for publication in the IET Biometrics Journal.

Sessions included Forensic Fingerprint Identification, Biometric Analysis of Crime Scene traces and their interpretation including palmprints, Audio Biometrics for Forensic Examination including speaker recognition and Physical Biometrics for Forensic Examination including iris recognition and gait.

Papers will be made available in

IEEE Xplore

The winner of the IWBF 2014 IAPR Best Paper Award was "View Transformation Based Cross View Gait Recognition using Transformation Consistency Measure" presented by Daigo Muramatsu, Yasushi Makihara & Yasushi Yagi from Osaka University, Japan. This was selected from among the best-reviewed submissions to the workshop by the Program Chairs.

Keynote invited speakers included: Prof. Sargur Srihari (University at Buffalo) who discussed the quantification of uncertainty in forensic identification of fingerprints and handwritten documents; Prof. Joaquin Gonzalez-Rodriguez (Universidad Autonoma de Madrid) who gave an overview of the NIST series of speaker recognition evaluations and technologies; and Prof. Didier Meuwly (Netherlands Forensic Institute) who discussed validation of computer assisted

Ms Joanna Vella (Co-Chiar of IWBF2014) presenting the IAPR Best Paper Award Certificate to Daigo Muramatsu from Osaka University, Japan at the networking dinner.

methods for forensic evaluation of biometric traces; Dr Andrzej Drygajlo (Ecole Polytechnique Federale de Lausanne) who spoke about the ENFSI 2011 Monopoly Program: Improving Forensic Methodologies Across Europe (IFMAE).

A panel session "Biometric Evidence Today and Tomorrow" was chaired by Dr. Andrzej Drygajlo (Ecole Polytechnique

Federale de Lausanne) and the panelists included Prof. Sargur Srihari (University at Buffalo), Prof. Didier Meuwly (Netherlands Forensic Institute), Dr. Daniel Ramos (Universidad Autonoma de Madrid), and Prof. Paulo Labato Correia (Instituto Superior Tecnico, Portugal). The panel was successful in extending the discussion to actively involve the audience.

A poster session included posters about facial imaging and recognition, ear pattern detection and biometric applications.

The workshop provided an international forum to develop synergies between biometrics and forensic science. Many outstanding researchers of both communities (biometrics and forensics), as well as practitioners and students, actively participated in IWBF 2014, contributing to the success of the event.

Tours—Loire Valley, France
April 7-10, 2014
http://das2014.univ-tours.fr

Workshop Chairs:
Jean-Yves Ramel (Univ. of Tours, France)
Markus Liwicki (DFKI Kaiserslautern, Germany)

Program Chairs:
Jean-Marc Ogier (Univ. of La Rochelle, France)
Koichi Kise (Osaka Prefecture Univ., Japan)
Ray Smith (Google, USA)

by Muhammad Muzzamil Luqman, University of La Rochelle, France

With this eleventh edition of DAS, the workshop was held for the first time in France after successful workshops in Gold Coast, Australia (2012); Boston, USA (2010); Nara, Japan (2008); Nelson, New Zealand (2006); Florence, Italy (2004); Princeton, NJ, USA

(2002); Rio de Janeiro, Brazil (2000); Nagano, Japan (1998); Malvern, PA, USA (1996) and Kaiserslautern, Germany (1994).

DAS 2014 continued its well established standards and introduced novel ideas. As usual, it was a peer-reviewed, single-track and 100% participation event. DAS 2014 attempted to bring together industrialists

and academics, as well as practitioners and theoreticians from numerous related disciplines, involved in document analysis systems' research and provided opportunities for interactions among them. For the first time, an Industrial Program Committee played an active role in the workshop. The industrial program committee was composed

Group photo of DAS 2014 participants at the Royal Castle of Amboise.

of researchers coming from companies; who are very active in the field and frequently participated at previous DAS workshops. As such, DAS 2014 emphasized the systems aspect which is already in its title!

DAS 2014 received a total of 138 submissions from researchers of 32 countries around the world. The Program Committee Chairs invited 45 international reviewers (the academic program committee and the industrial program committee) to review the papers. Each paper was reviewed by at least three reviewers (2 researchers from the academic program committee and one researcher from the industrial program committee). Finally, 73 long papers were accepted to be presented, of which 27 were for oral presentations and 46 were for poster presentation. As such, the acceptance rate for oral papers was 19.6%. The papers presented covered the diverse areas of preprocessing, feature extraction, segmentation,

recognition, signature verification, text classification, image retrieval techniques, video document processing, document image decoding, graphical document processing, performance evaluation, historical documents, handwritten documents and different systems on document analysis. The program consisted of 7 oral sessions, 2 long paper poster sessions, a short paper poster cum demo session and discussion sessions. A total of 145 participants from 23 different countries attended the workshop.

DAS 2014 presented awards to the papers of the best quality, selected by the awards selection committee. The US$1000 IAPR Nakano Best Paper Award was awarded to the paper "Business Forms Classification using Earth Mover's Distance" by Syed Saqib Bukhari, Markus Ebbecke and Michael Gillmann". The 500€ award titled "The ITESOFT Best Student Paper Award" was awarded to the paper "CERMINE - automatic extraction

of metadata and references from scientific literature by Dominika Tkaczyk, Pawel Szostek, Piotr Jan Dendek, Mateusz Fedoryszak and Lukasz Bolikowski".

Three distinguished researchers

were invited to deliver the keynote talks. The first keynote talk was given by Andreas Dengel (DFKI Kaiserslautern, Germany) on "Document Evolution drives

Document Analysis". Vladimir Rybkin (Head of Character Recognition and Image Processing Group, ABBYY) gave the second keynote talk which was titled "An Inside Look into ABBYY OCR Technology". Third keynote talk which was given by Vincent Poulain D'Andecy (Design and management of Document Analysis Systems, ITESOFT) was titled "From Academia to Industry, the knowledge transfer in Document Analysis".

DAS 2014 hosted two, very informative, tutorial sessions as well. The first tutorial, which was titled "Everything you always wanted to know about Tesseract", was given by Ray Smith (Google USA). The second tutorial, which was titled "Building Scalable Solutions for Document Retrieval and Recognition", was given by C. V. Jawahar (IIIT Hyderabad, India) and Pramod Kompalli (Xerox Research Centre, India).

DAS 2014 organized discussion sessions to provide an opportunity for the participants from academia and industry to interact. The topics for the discussion session were selected after online voting among the workshop participants. During the discussion sessions, participants were encouraged to participate in the discussion groups on one or more of the following topics: Information Extraction, Handwriting Recognition, Historical Document Analysis, Big Data, Camera-based Document Analysis & Recognition, and the DAS 2040. Very interesting discussions were carried out on these topics, from the points of view of the academic and the industrial researchers. The historical evolution of research, the state-of-the-art on the problems, open challenges and future directions of research were discussed in detail, by dedicated groups, for each of the topics. The summaries of the discussion groups were presented on the last day of the workshop, where a discussion was carried out from a global point of view among all the workshop participants.

The welcome reception was held at the city hall of Tours and the PC dinner at a traditional gastronomic fish restaurant Le Martin Bleu. For the social event a guided visit of one of the prestigious castles of the Loire valley - the Royal Castle of Amboise - was organized. A delightful surprise to the workshop participants was the sudden appearance of the workshop chairs and the program chairs, in traditional

historical royal dress. The workshop banquet was organized

in the historical ambiance of the Royal Castle of Amboise. The dinner was comprised of typical gastronomic food, local wines and traditional French entertainment. A beautiful fireworks display marked a memorable end to the unforgettable social event of the DAS 2014.

DAS 2014 engraved its digital traces in the form of a visual timeline on Twitter. You are invited to peek into the past and enjoy the unforgettable memories of the fantastic four days of DAS 2014, by visiting the visual timeline at *https://twitter.com/DAS__2014* !

DAS 2014 proceedings are available through IEEEXplore

IAPR Then and Now: "From the Editor's Desk" 30 Years Ago...

...as another ICPR was approaching

FROM THE EDITOR'S DESK
Dear Colleagues,

This newsletter hopefully reaches you at the 7th International Pattern Recognition Conference in Montreal, which is an occasion to reflect upon what we have accomplished and where we are going. From the preliminary program it is clear that the activity is growing and expanding to almost every engineering and scientific endeavour. I hope that the actual meeting will allow us to find out what is going on in different laboratories and exchange ideas. It is also an opportunity to hear from all the members what their wishes are for the direction of the society, the newsletter and future conferences.

I hope you will have a good time in Montreal, and I am looking forward to seeing you all.

With best wishes,

Ruzena Bajcsy

IDIPS 2014

International Document Image Processing Summer School 2014

Fourni Island, Greece
May 26-30, 2014
https://idips2014.pns.aegean.gr

Program Chairs:
Apostolos Antonacopoulos (PRImA, University of Salford, UK)
Ergina Kavallieratou (University of the Aegean, Greece)
Josep Llados (CVC, University Autonoma de Barcelona, Spain)

by Ergina Kavallieratou, Program Co-Chair

IDIPS2014 was endorsed by the IAPR Technical Committees TC-10 (Graphics Recognition) and TC-11 (Reading Systems), while co-organized by the Department of Information and Communication Systems Engineering of the University of the Aegean. It was financially sponsored by the IAPR, and the ELCVIA journal will publish a special issue of participants' papers. The summer school attracted 20 participants (postdoc, PhD and master students) from seven countries and nine universities/research institutes.

Venue

The Summer School took place for second year at the City Hall of Fourni.

Fourni is a complex or archipelago of small Greek islands that lie between Ikaria, Samos and Patmos in North Aegean region. The two largest islands of the complex, the main isle of Fourni (31 km²) and the isle of Thymaina (10 km²), are inhabited, as is Agios Minas Island (2.3 km²) to the east. On the main isle, Fourni (town) is the largest settlement with 800 habitants and also the main ferry harbor.

The Organizers provided IDIPS

2014 participants transportation from/to the airport Aristarchos of Samos. During their visit to Fourni, the participants enjoyed swimming at exotic beaches, staying in hospitable rooms, tasting traditional Greek dishes and fresh fish.

Technical Program

The technical program, this year, was focused on Document Analysis Systems.

During the morning (9.30-13.30), the program comprised of two lectures by well known researchers on Document Image Processing or other relevant areas, while in the afternoons (13.30-16.00) there were poster presentations, laboratories and panel discussions with the program committee members and the invited speakers. In more detail, the lectures were

given by (chronologically ordered):

- Daniel Lopresti, Lehigh University

- Ergina Kavallieratou, University of the Aegean

- Ioannis Pratikakis, Democritus University of Thrace

- David Doermann, University of Maryland

- Josep Llados, CVC, University Autonoma de Barcelona

- Jean-Marc Ogier, Universite de La Rochelle

- Stathis Stamatatos, University of the Aegean

- Tassos Anagnostopoulos, Unisystems

Seven students presented posters that were discussed and commented on in an evening

session. The students had the opportunity to practice in two laboratories on Binarization and Recognition.

The final panel discussion included interesting opinions and proposals on planning the next IDIPS. In more detail, the students asked for more practice in workgroups and competitions. The Program Committee decided that IDIPS 2015 would be held June 22-26, 2015, on the Greek Island of Kefalonia.

Social Program

All the registered participants were invited to dinner every evening in different restaurants on the island. Before dinner there was always a social event. Thus, the participants attended courses of Greek traditional dancing, fishing contest and cooking.

Moreover, on Tuesday evening the program included an excursion by boat to the nearby beach of Chrysomilia, where the participants had the chance to swim and get to know each other better.

IDIPS 2014 Best Poster Award

An award of 300 Euros on the name of IAPR was given to Sébastien Eskenazi from University of La Rochelle (see Next Generation article in this issue) for the poster entitled "Document semantic hashing for hybrid security" upon the recommendation of the Program Committee of IDIPS2014 for the poster quality and the significance of its presentation.

ICISP 2014

6th International Conference on Image and Signal Processing

Cherbourg, Normandy, France
June 30-July 2, 2014
http://www.stlo.unicaen.fr/icisp/2014/

General Chairs:
Abderrahim Elmoataz (Univ. de Caen Basse-Normandie, France)
Fathallah Nouboud (Univ. du Québec à Trois-Rivières, Canada)

Program Chairs:
Olivier Lézoray (Université de Caen Basse-Normandie, France)
Driss Mammass (Université Ibn Zohr, Morocco)

by Fathallah Nouboud and Olivier Lézoray

ICISP 2014 brought together about 120 researchers from more than 30 countries at the beautiful city of Cherbourg, France. Historically, ICISP is a conference resulting from the actions of researchers from Morocco, France, and Canada. The first and second editions of ICISP were held in Agadir, Morocco in 2001 and in 2003.The third edition was held in Cherbourg, in Normandy, France in 2008. The fourth edition was held in Trois-Rivières, Québec, Canada in 2010. The fifth edition was held in Agadir, Morocco in 2012. ICISP 2014 was sponsored by EURASIP (European Association for Image and Signal Processing) and IAPR (International Association for Pattern Recognition).

The Program Committee members carried out the review process. Each paper was reviewed by at-least two reviewers, and also checked by the conference co-chairs. From 164 full papers submitted, 76 were finally accepted (51 oral presentations, and 25 posters) giving an acceptance rate of 46 percent.

The conference program included four keynote talks by four world renowned experts: Antonin Chambolle (CNRS and Ecole Polytechnique, France), Jerome Darbon (UCLA, USA), Shoji Tominaga (Chiba University, Japan), Patrick Pérez (Technicolor, France).

Click above to go the
publisher's web site
for these volumes.

The conference hosted the 16th International Symposium on Multispectral Color Science, MCS 14, as part of ICISP 2014. Four special sessions were organized.

The best paper was selected out of a short list of papers that received the highest scores during the review process. The best paper was awarded to Gabriela Ghimpeteanu for her paper on "Denoising an Image by Denoising its Components in a Moving Frame". The award was handed out at the conference banquet.

Highlights of the Conference were also the social events. The welcome reception took place in the city hall of Cherbourg where invited Speakers received the famous "Parapluie de Cherbourg".

The Conference banquet took place in "La cité de la mer" along with a visit to the Aquarium and a nuclear submarine.

The next ICISP will be held in Trois-Rivières, Québec, Canada in 2016.

24-28 August 2014 Stockholm, Sweden

Registration >>

OPEN
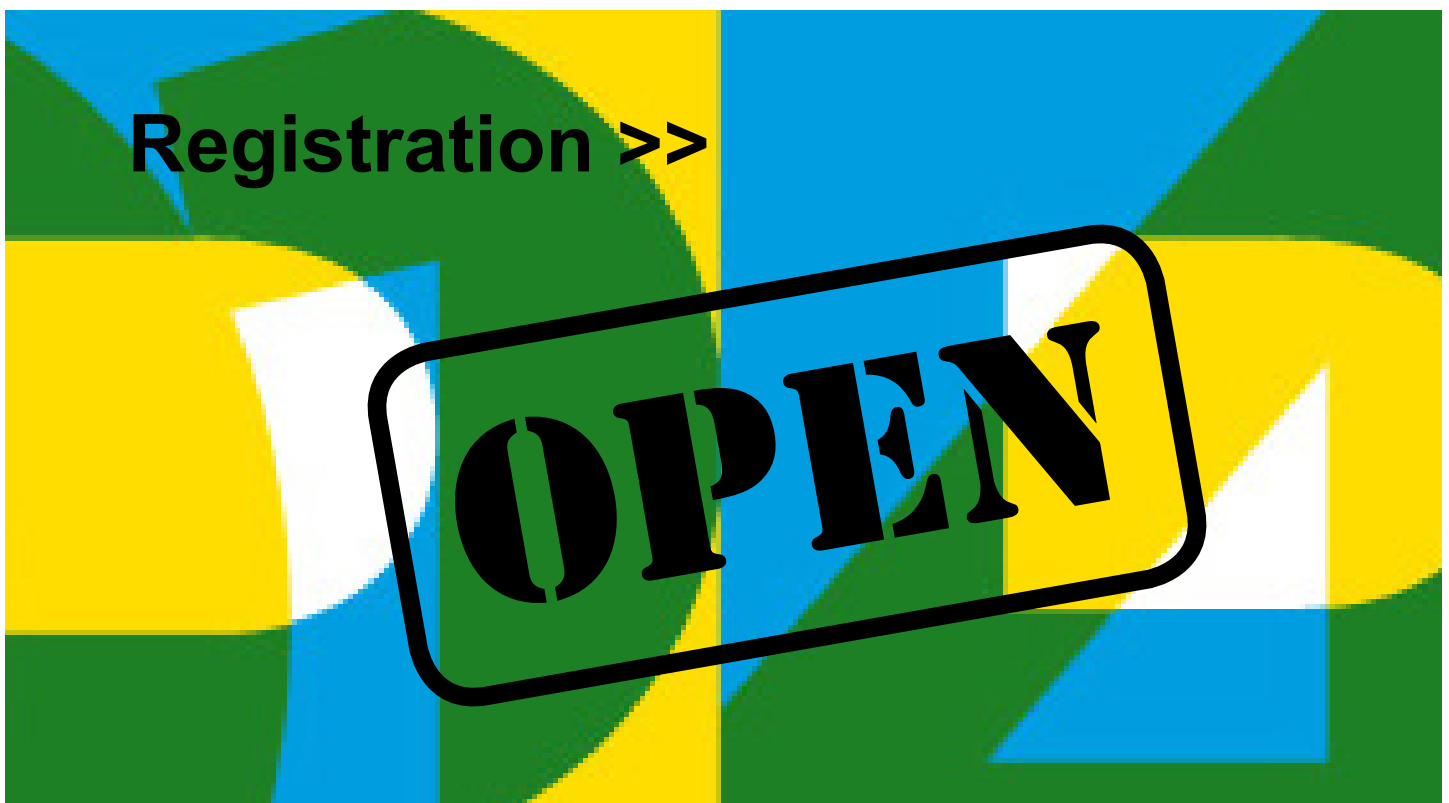
Digital Geometry, 1st Edition
Geometric Methods for Digital Picture Analysis
by Reinhard Klette and Azriel Rosenfeld

Morgan Kaufmann, 2004

Reviewed by Jovisa Zunic (University of Exeter, UK)

This is a self-contained book that presents and explains the main approaches and achievements in the area of digital geometry. It defined this field of research in 2004, and has been used since then frequently by researchers and students as a reference. The book is on the reading list of the Intelligent Image Understanding module, taught by me here, at the University of Exeter, for postgraduate computer science students. This review may also serve as a reminder that Azriel Rosenfeld, one of the founders of IAPR, had passed away 10 years ago (*Editor's note: please see "IAPR Then and Now" on Page 11 for the announcement of Azriel Rosenfeld as the first recipient of the prestigious King Sun Fu Award*), and the book documents also his great passion for the discussed subjects.

The book is also a general, very readable introduction to basic and advanced concepts in graph theory, geometry and topology, normally not expected in a book on an image analysis subject. It includes a comprehensive theoretical framework supporting the understanding of relevant concepts, theoretical observations, and analysis of results, algorithms and methods presented in various graph-theoretic, geometric and topologic disciplines.

Digital geometry is a relatively new scientific discipline, mostly related to the geometry and geometric properties of objects presented in digital images. It emerged in the 1960s in response to a strong demand for tools and theoretical foundations of tasks caused by developments in image technologies and applications related to digital image analysis and image synthesis (i.e. computer graphics). Even though there is a consensus that digital geometry, as a scientific discipline, was established in the second half of the 20th century, the evidence provided in the book reminds us that the roots of the discipline date back as far as the ancient times of Archimedes or Euclid. The authors have done a very extensive study of historic sources and have provided links, for example, to the work of Listing in topology, Gauss in combinatorial geometry, and Jordan in measurement theory (just to cite a few – there are many more in the book) for the first time to the digital geometry community.

Due to its completeness, complexity and the diversity of the material presented, the book is a recommended reading for a wide audience: from undergraduates to experts in the imaging technology field, but also, by several fundamental chapters, to others whose research and work relies on a use of graph-theoretical, geometric, or topologic concepts in other areas of science and technology.

The structure of the book supports reading by such a diverse audience.
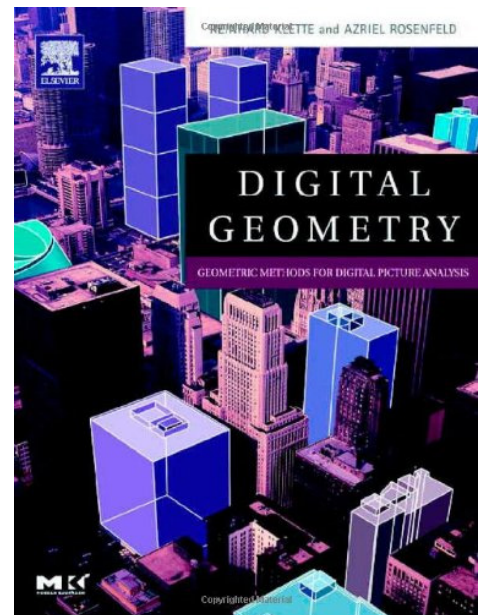
Click above to go the publisher's web site for these volumes.

There are 17 chapters in total. More or less, the different chapters allow independent reading, possibly with a relatively minor limitation due to the background of the reader, because the presentations are mostly completely covering and explaining the discussed subjects, including consistent notation throughout the book.

The first nine chapters, apart from the introductory observations and comments, provide all the necessary theoretical (mainly mathematical) foundations necessary to understand the selected topics presented in the remaining eight chapters. The selected topics might be understood as the most attractive and most fruitful ones studied so far (by 2004) in the area of digital geometry. Planar digital objects (lines and curves) and their properties and features are studied in Chapters 9 and 10.

Chapters 11 and 12 consider 3-dimensional objects and their properties and features. Hulls and diagrams are studied in Chapter 13, while Chapter 14 is related to transformations in the digital geometry domain. Morphologic operations and deformations are in Chapters 15 and 16, respectively. Picture properties (local and global ones) and spatial relations are observed and analysed in Chapter 17.

A lot of knowledge, expertise, experience and effort were preconditions to enable such a precise and comprehensive selection of the material that covers the discipline's essentials and puts aside details that can be easily found somewhere else. Precise sources and links to where such additional material can be found are provided, mainly under subsections named `Commented Bibliography' given at the end of every chapter.

Proofs provided are precise and supported by nice illustrations. A number of proofs are omitted. This enables a good balance between the book size (measured in terms of the number of pages) and the material covered (measured in terms of theoretical results, algorithms and problem solutions described and analysed). For interested readers, references to the relevant literature are provided whenever proofs are omitted.

Each chapter concludes with exercises whose complexity and difficulty levels vary. Simpler exercises and the experimental ones are more suitable for undergraduates, while more advanced ones are designed and intended for graduates and experienced researchers.

The book includes several additional features that make a read very pleasurable. I appreciated very much the comments and information that put the presented material in a wider context in computer science, mathematics and science in general. Some of them remind us that the roots of our current research were established many years, decades, or even centuries ago. This presents a nice and big picture of mutual connections between scientific disciplines dating back from ancient times till today. If we consider these presented observations as a vertical scan (i.e. through time), then we can see the horizontal scan as a discussion about relationships between disciplines, which meet and overlap over solutions for some particular problems. The book also emphasizes such horizontal scans for a number of problems discussed in digital geometry. These different levels of detail, from very deep and specific observations (related to a specific problem) to illustrations of very global inter-connections of different scientific disciplines, differentiate this book.

A recent online-review by Ralph Reinhold says "I think anyone working in the field of computer vision should read this or better yet take a course in it." I fully concur with this; the book is highly recommended for educational and academic enlightenment for many more years to come.

We are looking forward to reports on the following books under review:

1. *Airborne and Terrestrial Laser Scanning* by George Vosselman, Hans-Gerd Maas (Whittles Publishing, 2010). Reviewer: Giuseppe Maino. Under review since February 2010.

2. *Guide to Medical Image Analysis* by Klaus D. Toennies (Springer, 2012). Reviewer: Alexandra Branzan-Albu. Under review since June 2012.

3. *Support Vector Machines for Pattern Classification, 2nd Ed.*, by Shigeo Abe (Springer, 2010). Reviewer: Huthaifa Abderahman. Under review since July 2013.

4. *Concise Computer Vision* by Reinhard Klette (Springer 2014). Reviewer: Tayyab Naseer. Under review since February 2014.

5. *Euclidean Shortest Paths* by Fajie Li, Reinhardt Klette (Springer, 2011). Reviewer: Arindam Biswas. Under review since March 2014.

6. *Decision Forests for Computer Vision and Medical Image Analysis* edited by Antonio Criminisi and Jamie Shotton (Springer 2013). Reviewer: Zeeshan Zia. Under review since April 2014.

7. Person Re-Identification by Shaogang Gong et al. (Springer 2014). Reviewer: Donatello Conte. Under review since May 2014.

Shape Perception in Human and Computer Vision: An Interdisciplinary Perspective
Series: Advances in Computer Vision and Pattern Recognition
By Sven J. Dickinson and Zygmunt Pizlo (Eds.)

Springer, 2013

Reviewed by Dima Damen
(University of Bristol, UK)

Published by Springer last year as part of the 'Advances in Computer Vision and Pattern Recognition' series, Dickinson and Pizlo edited thirty-four chapters written by seventy-three contributors. As their introduction states, the book is the result of a series of successful workshops on the topic (ECCV08, ECVP09, ECCV10 and VSS11). I recall attending the ECCV08 workshop in Marseilles, and despite the perfect sunshine, I found it more rewarding and enjoyable to attend the SPHCV workshop for a full day of interaction between human visual perception and computer vision experts. The book, as were the workshops, is an inter-disciplinary venture attempting to highlight similarities and identify differences in concepts and approaches between the two wealthy research domains. A comprehensive review of this book is quite difficult, with many chapters presenting state-of-the-art research and experimentation that are indeed worth reading. This review, instead, attempts to focus more on the arguments and concepts proposed by the various authors in both human and computer perception. Five ideas are presented next, which I found extremely interesting to think of while reading the book.

1. Definition and representation of shape:
In the various chapters, authors unanimously agree on the
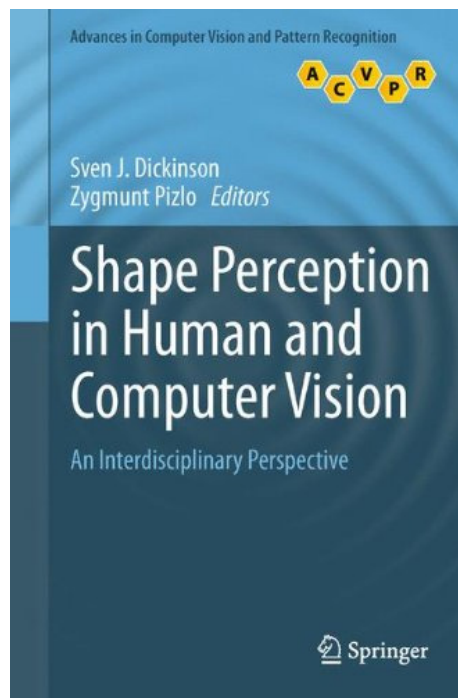
Click above to go the publisher's web site for these volumes.

importance of shape, with experiments evidently showing that humans rely on shape and texture (rather than luminance on colour) in natural scene understanding (e.g. Ch. 5). Interestingly, and probably wisely, the editors do not attempt to adopt or unify a definition of 'shape'. Probably my most favourite description of the term is accredited to Wagemans (Ch. 6) where he states that "Shape is a beautiful thing". The question of whether all objects have shapes is discussed, or more interestingly whether certain objects have "more of a shape" than others (Ch. 2). For example Li et al. wonder whether a crumpled paper has a shape (Ch. 2) while Koenderink and van Doorn question whether space has a shape (Ch. 10).

Other attempts to define shape can be found throughout the book. In Ch. 25, Ommer specifies that shape is what 'glues' local features into a "sound spatial layout". In Ch. 23, Shi refers to shape as "an expressive abstraction of visual

patterns in natural images." More mathematically, probably, Tyler refers to shape as "the properties of a manifold embedded in higher-dimensional space," (Ch. 24).

While some authors adopt a definition of shape, others devote their focus to rejecting currently-used definitions. In Ch. 2, Li et al. explain why the "invariance under transformation" is certainly not related to human shape perception, even if computationally-motivated. Crucially, several human vision experts argue whether the goal of computer vision shape perception actually matches that of human shape perception. Singh and Hoffman take an evolutionary point of view, where shape is merely an "effective code for expected fitness that has been tuned by natural selection" (Ch. 12).

Human shape perception certainly does not target veridical metric reconstruction, as "neither perceptual judgements nor motor actions are based on a veridical metric analysis of the visual scene", but only encodes relative properties of the object structure (Ch. 20).

With a more practical goal, authors discuss possible representations of shape. Cremers (Ch. 7) distinguishes between explicit representations (of points on the object's boundary or surface) and implicit representations (of the object's interior). Explicit parametric representations are adopted in Ch. 7 and Ch. 15, where the outline is modelled as a parametrised curve or surface. An implicit representation of the interior as a triangular mesh is presented in Ch. 21 as a computationally efficient one.

Skeleton-based representations are discussed (Ch. 3-5), motivated

by the uniqueness of skeletons and the ability to reconstruct a boundary from its skeleton. Other representations based on formelets (Ch. 5) or arclets (Ch. 18) are also addressed.

2. Fifty years of computer vision—a paradigm shift:

While shape has been the focus of research in Computer Vision during the 70s and 80s of last century, the trend has shifted dramatically recently, with fresh work on edge-based object detection rarely observed in major venues and journals. Several chapters discuss the poor performance of current detectors and texton-based descriptors on objects that have little or no texture (Ch. 23 and Ch. 33). In Ch. 25, Ommer presents a beautifully written historical review of shape based object/visual recognition, a critique of developments in the field as well as an outlook into the future. Ch. 1 also discusses the paradigm shift and the influence of searching for a single category on formulating the shape perception problem.

3. Low-level, mid-level or high-level processing:

The book thoroughly discusses frameworks for the integration of low-level, mid-level and high-level processing towards shape perception. It is evident while reading this book that little belief is left in the hierarchical/pipeline approach to shape perception, in both humans and computers.

Several chapters in the book are devoted to discussing the feedforward feedback influences on shape analysis (Ch. 5, 6, 11, 25). In Ch. 11, Zucker clarifies that a deeper understanding of Neuroscience reveals a complex processing architecture. While separating segmentation (as a goal for early vision) from recognition (as a goal for higher-level vision)

has always been problematic, trying to solve them jointly "makes it theoretically questionable about how to proceed" (Ch. 11).

In Ch. 5, Elder explains the argued involvement of feedback connections in the human brain during perception of complex natural scenes. Visual pathways communicated fragmented hypotheses to higher-order areas which generate more complete hypotheses of shape (via contour completion potentially). These hallucinations are subsequently tested (or confirmed) in earlier visual areas.

In Ch. 6, Wagemans adopts the viewpoint that low-level, mid-level and high-level analyses collaborate to achieve shape identification in human vision.

The influence of the high-level familiarity, or priors, of shape on low-level processing and the computation model for shape perception has also been tackled (Ch. 1, 4, 7, 30). In Ch. 30, Peterson and Cacciamani particularly focus on the link between perception and memory, proposing a dynamic view of object perception that strongly links the high and low levels of perception.

The book also devotes several chapters to the power of low-level processing on the perception of shape. Zaidi et al., for example, show how the orientation modulation in textured images, viewed monocularly, give a perception of the 3D shape (Ch. 22).

4. Perceptual grouping:

As expected, the power of and need for perceptual grouping is a primary topic in several chapters (Ch. 1, 4, 23, 25, 30), as shape parts are significantly less distinctive than texton-based features. "A single shape part,

unlike a SIFT feature, carries very little distinctiveness. Only when shape primitives are non-accidentally grouped together do the resulting higher-order structures posses the indexing power ... to ... promising candidates", Dickinson et al. state (Ch. 1).

The topic of perceptual grouping is strongly linked to the Gestalt notion of 'foreground-segmentation'. This becomes more difficult when the object to clutter ratio (i.e. size of object in the scene) decreases (Ch. 23). In Ch. 30, Peterson and Cacciamani vividly argue against the Gestalt term "figure-ground segregation" as a prerequisite to perception in spite of ample evidence to support it. Despite the strong link, Feldman et al. state that "theoretical connections between shape and f/g [figure-ground] remain largely unexplored" (Ch. 4). As opposed to discussing whether foreground segmentation precedes shape perception, Wagemans state that "shape-perception, shape-based object identification and segmentation are all tasks that require perceptual organization" (Ch. 6).

Of the various approaches to perceptual grouping in this book, Ch. 1 uses region-based (using super-pixel) grouping guided by symmetry and contour closure. In Ch. 18, Kellman et al. discuss the notion of contour interpolation, guided by relatability, to unify regions across gaps towards a meaningful shape.

5. Two-dimensional (2D) versus three-dimensional (3D) representations:

While most chapters in the book discuss shape as a two-dimensional representation, other chapters focus on shape as a representation of a three-dimensional structure (Ch. 8, 9,

14). Hu et al. compare an object-centred representation of shape with a view-centred representation often using a "collection of 2D representations each covering a small portion of the modeled views" (Ch. 17).

They state that due to the difficulties of matching object-centred representation to images, most of the computational approaches favour the view-centred representation, while combining 2D and 3D primitives outperforms using 2D primitives solely (Ch. 17). Similarly, in Ch. 24 a framework is proposed to combine cues (depth, texture, ...) into both 2D and 3D shape representations. The effect of light on perception of three-dimensional shapes is reviewed in Ch. 8, 9 and 16. Evidence exists that humans use a prior on the lighting direction (particularly lighting from above) in shape perception (Ch. 16). Even beyond visual cues, Wallraven argues that shape perception is the result of multisensory processing, particularly considering the haptic modality (Ch. 23).

Conclusion: Reading Dickinson and Pizlo's compilations is both enjoyable and educational, due to the wide collection of contributions in a single volume. The book successfully addresses the balance between asking difficult questions, arguing certain answers and providing clues for future directions. The book would have benefited from a conclusion that unifies and compares the slightly fragmented ideas spread throughout the book. The editors though might have felt that this is the role of the reader. A recommended book to interested researchers working towards shape-based approaches to visual perception.

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
2014	JUL	ICVSS 2014: International Computer Vision Summer School—From Fundamentals to Applications	ICVSS 2013	**Italy**
		MISS 2014: Medical Imaging Summer School 2014		**Italy**
	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**
		PRIB 2014: 9th IAPR Conference on Pattern Recognition in Bioinformatics	PRIB 2012	**Sweden**
		IWCF 2014: 6th IAPR International Workshop Computational Forensics (in conjunction with ICPR2014)	IWCF 2010	**Sweden**
		VAAM 2014: Video Analytics for Audience Measurement in Retail and Digital Signage (in conjunction with ICPR2014)		**Sweden**
		IWPRHA 2014: 2nd International Workshop on Pattern Recognition for Healthcare Analytics (in conjunction with ICPR2014)	PR4HA@ICPR2012	**Sweden**
		I3A: First Workshop on Pattern Recognition Techniques for Indirect Immunofluorescence Images (in conjunction with ICPR2014)		**Sweden**
		FFER 2014: 1st International Workshop on Face and Facial Expression Recognition from Real World Videos (in conjunction with ICPR2014)		**Sweden**
		PRRS 2014: Pattern Recognition in Remote Sensing 2014 (in conjunction with ICPR2014)	PRRS@ICPR2012	**Sweden**
		AMMDS 2014: 2nd Workshop on Activity Monitoring by Multiple Distributed Sensing (in conjunction with ICPR2014)		**Sweden**
		* Full list of Workshops, Tutorials and Contests held with ICPR 2014 *		**Sweden**
		ICPR 2014: 22nd International Conference on Pattern Recognition	ICPR 2012	**Sweden**
		IMVIP 2014: Irish Machine Vision and Image Processing Conference		**Ireland**
	SEP	ICFHR 2014: 14th International Conference on Frontiers in Handwriting Recognition	ICFHR 2012	**Greece**
		DGCI 2014: 18th IAPR International Conference on Discrete Geometry for Computer Imagery	DGCI 2013	**Italy**
		ACVR 2014: 2nd Wkshp on Assistive Computer Vision and Robotics		**Switzerland**
		IJCB 2014: International Joint Conference on Biometrics	ICB 2012	**USA**
	OCT	ANNPR 2014: 6th IAPR TC3 International Workshop on Artificial Neural Networks in Pattern Recognition	ANNPR 2012	**Canada**
	NOV	CIARP 2014: 19th Iberoamerican Congress on Pattern Recognition	CIARP 2013	**México**

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		Meeting	Report	Location
2015	MAY	MVA 2015: 14th IAPR International Conference on Machine Vision Applications	MVA 2013	**Japan**
		ICB 2015: 8th IAPR/IEEE International Conference on Biometrics	ICB 2013	**France**
	AUG	ICDAR 2015: 13th International Conference on Document Analysis and Recognition	ICDAR 2013	**Tunisia**
		ACPR 2015: 3rd Asian Conference on Pattern Recognition	ACPR 2013	**Malaysia**
	NOV	PSIVT15: 7th Pacific Rim Symposium on Image and Video Technology	PSIVT13	**New Zealand**

Suggestions for the IAPR?

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