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new

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From the Editor's Desk: Getting your paper rejected

by Arjan Kuijper

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Last year, I spent several "From the Editor's Desk" columns on publish or perish: the urge to publish papers and assign quality numbers to them. Before you can get that far, though, you'll first have to write something down. Some novelty should have been thought of and some experimental results or proof of concept should be there. But then... Then you enter the world of peer-review. Many colleagues I spoke with agree with me that writing the first paper is tough, but getting the first rejection is tougher. "How can it be possible that reviewers are not able to understand that I did something excellent, that is worth the best paper award – or at least (perhaps more realistic) worth being accepted?" Writing papers is difficult, getting good research into a paper that gets accepted is even more difficult. Some of the young researchers interviewed in the "Next Generation" series identified "being coached in writing good papers" as an important issue during their PhD that was (or is) missing.

To me, this sounds familiar. Young researchers need a few different kinds of coaching. The first, most obvious and, perhaps, most neglected is in writing. Unfortunately, many scientists consider courses on writing and presenting – soft skills – as waste of time. They argue that in 'our situation' (read: [computer] sciences) things are different than in, say, literature studies, the background of many teachers of these courses. Additionally, they feel that two hours a week plus home work for several weeks could be better spent on the science rather than on a mini-course in scientific writing. I would argue that this investment of time is probably worth the effort: for scientific communication you should learn to speak the right language.

The next thing you need is a person: a buddy or a sparring partner. The more of them, the better! It requires an attitude of openness and trust. Some scientists I spoke didn't dare to ask colleagues for various reasons: "What if some else steals my idea?", "Let's wait until I am satisfied with what I wrote.", or "They will think what I did is nonsense." Well, if they

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/

[ICDAR 2015](#)

13th International Conference on Document Analysis and Recognition
Gammarth, Tunisia
Dates: Aug. 23-26, 2015
Deadline: Jan. 31, 2015

[MCS 2015](#)

12th International Workshop on Multiple Classifier Systems
Günzburg, Germany
Dates: Jun. 29-Jul. 1, 2015
Deadline: Jan. 30, 2015

[Biometrics 2015](#)

12th Summer School for Advanced Studies on Biometrics for Secure Authentication:
Biometrics in Forensic, Security and Mobile Applications
Alghero, Italy
Dates: Jun. 22-26, 2015
Deadline: Feb. 15, 2015

[ICIAP 2015](#)

18th International Conference on Image Analysis and Processing
Genova, Italy
Dates: Sep. 7-11, 2015
Deadline: Mar. 16, 2015

[ACPR 2015](#)

3rd IAPR Asian Conference on Pattern Recognition
Kuala Lumpur, Malaysia
Dates: Nov. 3-6, 2015
Deadline: Jun. 1, 2015

[PSIVT 2015](#)

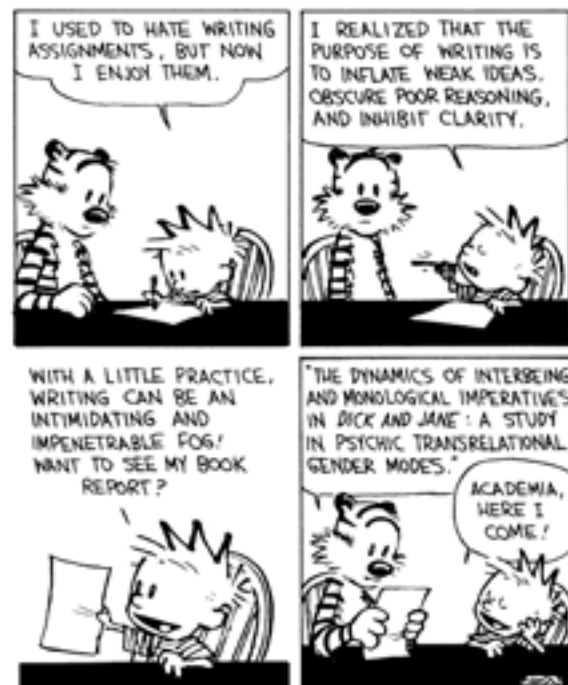
7th Pacific Rim Symposium on Image and Video Technology
Auckland, New Zealand
Dates: Nov. 23-27, 2015
Deadline: Jul. 24, 2015

are right with the last statement, it is better that they tell you than that reviewers will do it! Having a buddy forces you to get to the point and clearly formulate what you want and what you did. Getting this clear for yourself is often even more important than the actual feedback you get! The buddy may feel like the caricature of a psychiatrist in the movies who says “Yes”, “Mhmm”, and “Can you say more on this?”.

I am currently in the lucky situation that it is part of my official task to be such a sparring partner, and I love this “Mhmm”! The most interesting thing I experience is that most people, who use my offer to read their drafts, actually already have very good results. The only thing that is lacking is a proper ‘packaging’. So that’s the last thing you need: a friendly person willing to look at your draft paper as a nasty reviewer: “*why should I reject your paper?*” In one of the courses I give, I have collected [10 ways to get your paper rejected](#). Somehow, most of us are very good at obscuring the novelty of our ideas and, like Calvin (below), putting impenetrable fog over our experiments.

Over the years, I have been collecting materials on writing papers (and a PhD). A collection you can find on <http://www.gris.tu-darmstadt.de/~akuijper/coaching.html>. In the forthcoming Newsletters, I will go into more detail. Sneak preview: “*Writing a paper is not about describing the system you programmed or the algorithm you improved, it is about ‘conveying your idea from your head to your reader’s head’.*” ([Simon Peyton Jones](#), from his excellent slides [How to write a great research paper](#)).

Happy writing!



Calvin and Hobbes
by Bill Watterson



Getting to know...Ludmila Kuncheva

Sharing my dreams

Ludmila Ilieva Kuncheva, IAPR Fellow

ICPR 2012, Tsukuba Science City

For contributions to multiple classifier systems

by [Ludmila Kuncheva](#), Bangor University, UK

Once upon a time, when I was a little girl, and computers were a thing of the future, I had a dream project. Can we invent a device that will record our dreams and then, by request, project them back? But not on a screen – directly into the brain, so that we can feel the same way as in the dream. Haven't you ever dreamed that you can fly? Or move objects with your mind? Wouldn't it be great to relive those feelings again? Movies and novels aside, to this day, we still don't understand the human brain well enough to be able to take even baby steps towards my childhood dream project, let alone then. But I had to try.

My path was somewhat paved from the beginning - mum and dad were engineers, granddad was an engineer, auntie and uncle were engineers... Hmm, I was not going to be a ballerina. Dad was a Head of Control Systems at the Technical University of Sofia at the time. Midway through my studies there, however, I discovered pattern recognition and fell in love with it. Dad was not best pleased that I abandoned his beloved control-systems area, but was quietly proud of me for flying the engineering nest.

I can't say what I like most about

pattern recognition; whether it is the beauty of its logic and structure, its intuitiveness, the magic of probability or the tease that you can sit down and do it all yourself. Or maybe the eternal challenge of an unsolved puzzle?

I got the classifier ensemble bug sometime in the 1980s. The Iron Curtain, scarce literature and no Google at that time didn't help. (Thankfully, my first and quite amateurish publications are in Bulgarian.) I have met many kindred spirits on my way. I had the pleasure and the privilege to learn from some masters in the field, among whom are [Jim Bezdek](#) (Pensacola, Florida) and [Bob Duin](#) (Delft, The Netherlands).

Today, it is a comfort and pleasure to watch the evolution of competent and passionate younger generations of researchers bitten by the same classifier ensemble bug. The process of nurturing new talent has also been greatly enhanced by the series of Workshops on Multiple Classifier Systems (MCS), running nearly every year since 2000, organised by [Josef Kittler](#) (Surrey, UK), [Fabio Roli](#) (Cagliari, Italy) and an elite of devoted hosts from four continents.

Nowadays, classifier ensembles don't need an advocate. The [NETFLIX contest](#) winner used an ensemble approach. The famous [Viola-Jones algorithm](#) for face

detection in an image uses an ensemble approach.

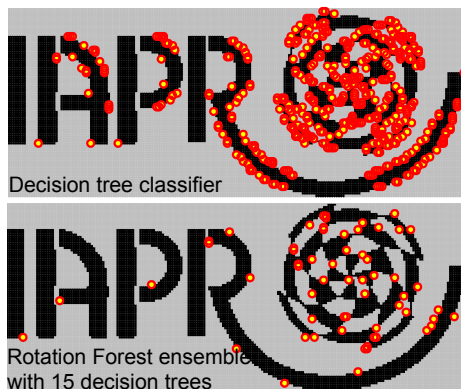
The idea behind classifier ensembles is that 'two heads are better than one'. An ensemble is successful if it outperforms the individual classifiers it consists

Ludmila (Lucy) I. Kuncheva received the MSc degree from the Technical University of Sofia in 1983 and the PhD degree from the Bulgarian Academy of Sciences in 1987. She joined Bangor University, UK, in 1997, and is currently a Professor of Computer Science there.

Her interests include pattern recognition, machine learning and classifier ensembles. Lucy has published two monographs and over 150 research papers. She is a Fellow of the International Association of Pattern Recognition. Lucy has served as an Associate Editor for IEEE Transactions on Fuzzy Systems and IEEE Transactions on Pattern Analysis and Machine Intelligence. She has won the 2006 IEEE Transactions on Fuzzy Systems Outstanding Paper Award and the 2003 Andrew P. Sage Best Transactions Paper Award - IEEE Transactions on Systems, Man and Cybernetics.

Google Scholar profile: <http://scholar.google.co.uk/citations?user=W1c3assAAA&hl=en>

of. Here is an example: classify the silhouette of the IAPR logo as foreground versus background using only the (x,y) coordinates of the pixels as training data (without any image context).



Miscalculations are marked with red circles. Go ensembles!

My favourite topic in classifier ensembles is diversity – something so important, yet so elusive. It will not be an exaggeration if we say that there are nearly 100 diversity measures on the scene, each one ‘better’ than the last. And just when we think we have discovered the best diversity measure of all, the little, old killjoy of a question pops up: “What now?”

Ironically, progress in the classifier ensemble area is still driven not by measuring diversity between the ensemble members but by intuition and heuristics which informally encourage such diversity. Look at the leading ensemble methods: Bagging, AdaBoost, Random Forest, Random Subspace, Rotation Forest – none of them are based on an explicit optimisation of a diversity criterion. And still, all of them owe their success to ingenious ways of inducing diversity. Curious...

Curiosity can take us in different avenues. What lies ahead for classifier ensembles? Perhaps, like all other disciplines, classifier ensembles will evolve to provide better answers to the challenges of real-life problems: unbalanced

classes, concept drift, multi-view and distributed data, problems with peculiar constraints and last but not least – big data.

Ah, big data... Big data scares me. Honestly! Like eternity... and infinity... But more importantly, I fear that pattern recognition may lose that little-puzzle charm and drown into data collection, storage and management, fast processing, distributed algorithms, parallel computing and so on. All these have their own appeal but will not cure my nostalgia for the little pattern recognition puzzle. Remember how many different and clever algorithms there were in the 1970s for tuning a linear classifier? They are all obsolete now. Big data is knocking on the door, so big data we shall learn to love.

This brings me to the question of the wider visibility of what we do. Pattern recognition is everywhere; the ensemble algorithms can be applied to anything. If I pick an example I risk being stereotyped as solving exclusively this problem. So when an interviewer asks the question “What do you actually do?” I reply “Erm... well... anything...” (My student Joe doesn’t have this problem. He flies a quadcopter in the corridors of our building and everybody knows what Joe does.)

But when I think of the breadth of applications we have worked on, it does sound like a randomly concocted and incoherent list: fMRI data classification, kerogen identification in images of palynofacies, evaluation of parameters for distinguishing serial gold-medallists among athletes, estimation of heavy metal contamination patterns in Liverpool bay, classification of COPD (chronic obstructive pulmonary disease), prediction of cardiac rhythm aberrations in pilots during examination in a centrifuge

camera, and identification of contraction episodes in capsule endoscopic videos. The interviewer nods politely, blinks and utters “How very interesting!” before leaving. And, in fact, this is not what I do.

In this era of formidable information overload, I predict a revolution. Reviewing will become obsolete. It was needed in the past because there was no way to tap a larger reader audience for an opinion poll. Peer reviewing has been the only credible way to maintain standards of publication. The growing diversity of topics makes this process impractical, biased or spurious. We have technology now! We can allow for reviewing on a massive scale. Imagine a large pool of papers, automatically clustered and positioned within a big mosaic. Where do you look for papers? Do you have the time to browse the contents of all relevant journals? No, but you don’t have to – thank you, Google! Now suppose that we all have access to all papers. The best papers will be spotted and cited over and over. The citations will replace the reviews.

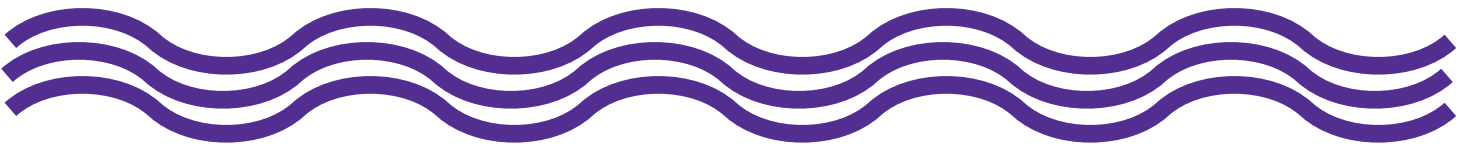
There will be fewer journals and only the best papers will find their place in them. These papers will no longer be original research, they will be rather ‘the best of’. Selected by citation from the pool, say for the past year, these papers can undergo a round of peer reviews. This time, however, the reviewing rules will be different. First, all reviewers will be handsomely paid. Second, reviewers will bid for a paper. The candidates should submit their records, and the Editor will have the task to select between them. As an additional benefit, a lot of human resource will be spared for better use of people’s expertise and energy, and, surely, fewer trees will be cut down.

Yeah, dream on, right ☺? But so many things have been revolutionised since I entered into this field, that advancements in culture and technology may well lead to the realisation of the dream of a revised reviewing system. As for my 'dream projecting machine' where you can play back the sweetest moments from your night's slumber, be they Santa being real, time flowing backwards, gravity not existing or 20 kilos of body fat melting away in a minute, who knows? Maybe someday this will happen. In the meantime, I will keep doing the job I love.



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12th International Workshop on Multiple Classifier Systems

Reisensburg Castle, Gunzburg, Germany, Ulm University, June 29 - July 1



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

Syed Saqib Bukhari

Editor's note:

Syed Saqib Bukhari received the [IAPR Nakano Best Paper Award](#) at [DAS 2014](#)!

~ Arjan Kuijper, Editor-in-Chief

by [Syed Saqib Bukhari](#), Multimedia Analysis and Data Mining Research Group, DFKI, Germany

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

After completing a Masters degree in computer systems engineering at the NED University of Engineering and Technology, Karachi, Pakistan, I moved on to the Technical University of Kaiserslautern in Germany for further studies. There I wanted to pursue my PhD in the field of computer vision and pattern recognition, however, besides a basic interest; I had no prior experience in the field. So before starting any research work, I first attended image processing, pattern recognition and machine learning courses. This was my very first interaction with pattern recognition. This gave me a



Syed Saqib Bukhari completed his PhD in late 2012 in the Image Understanding and Pattern Recognition (IUPR) Research group of the Technical University of Kaiserslautern and the German Research Center for Artificial Intelligence (DFKI GmbH) with Professor Thomas M. Breuel and Professor Andreas Dengel.

During his PhD, he also worked in Fraunhofer-Gesellschaft Germany as a research assistant in the field of microscopic materials image analysis, and he did internship in the area of GIS analysis at NEC Japan.

After completing his PhD, he worked as a research and development engineer for more than two years till December 2014 at Insiders Technologies GmbH Germany, which develops digital mailroom processing systems. There he was mainly involved in making research prototypes for business forms, text and email classification systems as well as development of incremental features in the current digital mailroom processing systems.

Recently he has joined the German Research Center for Artificial Intelligence (DFKI GmbH) as a senior researcher in the Multimedia Analysis and Data Mining (MADM) group.

chance to read plenty of research literature and to implement a number of related small projects, for example digit recognition and car number plate extraction. As a result, my initial interest in this field really transformed into my passion.

After completing the coursework, I joined Professor Breuel's research group Image Understanding and Pattern Recognition at the DFKI, Kaiserslautern, for my PhD, where I was introduced to the area of document image processing, especially to monocular camera-captured document image processing. The field has become popular because of inexpensive and widely-used digital cameras as well as more flexibility in comparison to scanner-based document image processing. However the surface of a camera-captured document image may be curvilinear or warped because of non-planar surface of the page. My first challenge was to develop a monocular dewarping method to transform a warped document image captured by camera into one similar to a scanned image with straight edges. For this, I used an approach based on the text lines and initially developed a curvilinear text line extraction method to straighten curved text lines. During the implementation phase, I read a lot of research literature on the topic. I learned that no universal text line extraction method existed that could be robustly and equally applied to a diverse collection of document images including typed-text, hand-written and historical documents, scanned and camera-captured documents, binary and grayscale documents, as well as document images containing different scripts such as Latin, Chinese, Arabic, and Indic. Instead, there was a specific extraction algorithm for each specific image type. To the best of my knowledge, I developed

the first generic text line extraction method that can be directly applied on a large variety of document image classes. My approach is based on a simple combination of two standard computer vision algorithms: matched filtering and ridge detection. With this as the major component of my PhD thesis, I also presented important applications like dewarping of camera-capture documents, document layout analysis of complex Indic script, and preprocessing of degraded historical documents.

After completing my PhD, I joined the development team at Insiders Technologies GmbH, Kaiserslautern, a company that provides digital mailroom solutions. There I mainly worked on the topics of business document classification and text mining. Recently I have joined Multimedia Analysis and Data Mining group at the DFKI as senior researcher.

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

My main research areas are computer vision, pattern recognition, machine learning, document image analysis and geographic information system processing. My current research interests include (but are not limited to): (i) historical document image analysis for providing a technical and social infrastructure to support the humanities in responding to research questions on the basis of preparation and quantitative evaluation of editions and text collections, (ii) automatic processing of incoming mails (Forms, Invoices, Emails, etc.) using Document Analysis Systems (DAS), (iii) architectural sketches processing to assist architects at the conceptual design stage, (iv) automatic vectorization, mosaicing and registration of old colonial-era cadastral map images.

One of my recent work that was published in the DAS'14 conference proceedings is related to business forms classification, which I briefly describe here. Thinking in the categories of semi-structured and free forms, the processing of structured business forms seems to be the least complex task. Using segmentation-based form classification strategies, it is trivial to classify an incoming form. However, these methods do not meet the requirements in current commercial document analysis projects, where we are dealing with the challenging problems like fax distortions and content variations.

To overcome these challenging problems and working with other developers in my team, I developed a generic form classification method using the Earth Mover's Distance (EMD). The EMD is widely used in computer vision for content-based image retrieval to compute distances between the color histograms of two digital images that may differ due to dithering, blurring, or local deformations. Form classification problems, especially for forms containing distortions and variations, could be effectively solved by using the EMD exactly as with content-based image retrieval. However, this area was not fully explored in the field of document image analysis due to certain limitations, such as form images being mostly present in binary instead of colored format. Therefore the color-histogram-based EMD approach does not make sense for form classification. My proposed method solves this limitation by first transforming a binary form image into a meaningful color-coded form image, and then applying the EMD to the latter for classification. The idea is very simple and solves the major problems of form

classification.

How can the IAPR help young researchers?

The IAPR is already helping young researchers by hosting many conferences and offering a number of publication opportunities. They also organize various awards for the next generation of researchers.

In my opinion however, IAPR could provide additional support in the area of networking and collaboration. With special discussion groups and consortiums accompanying the existing IAPR conferences. Also, with the help of social media platforms, young researchers could meet each other, submit project proposals and

create collaborative networks.

Using web-based presentations and reviews, input and feedback from peers as well as senior researchers and professors in the field could be gathered and used to receive funding or generate ideas for further work.

IAPR Then and Now: From the *IAPR Newsletter*, Vol. 28, No. 2, April 2006

Pattern Recognition at the US Postal Service: A Decade of Achievement

by [Sargur Srihari](#) and [Srirangaraj Setlur](#), *CEDAR*, University at Buffalo, State University of New York, USA

The early 1990s brought an upsurge of interest in document image processing. This was partly the result of scanners becoming inexpensive thanks to the prevalence of fax machines, and also due to improvements in computer speed and memory size to deal with document images that were about 9Mbyte (scanned at 300 dpi).

[...]One of the most exciting applications of document image processing was in the postal area. The purpose was to recognize information in the address fields of envelopes and boxes to route this mail more efficiently and inexpensively. This required the techniques of machine- and hand-written character recognition, automatic page layout analysis, and low-level processing such as noise reduction and binarization. There were two reasons that this was a perfect application for document image recognition. One was that the fields on envelopes have a well-defined syntax, and, though there are deviations, this constrained a very difficult problem to be more manageable. The other reason was that the impact that could be made, even by small improvements, was huge, given the volume of mail.

Professor Sargur Srihari and his group at CEDAR (Center of Excellence for Document Analysis and Recognition), were early pioneers in applying document image recognition techniques to the postal application. At this time, roughly a decade after the work began, I asked for a recap of the work and current status of deployment.

~(L. O'Gorman, ed.)

The United States Postal Service (USPS) is a major consumer of pattern recognition technology. Systems for sorting printed addresses for letter mail have been in existence since the mid-sixties. Systems for sorting handwritten addresses were introduced in 1996.

The task of handwritten address interpretation (HWAI) is illustrated in the letter image shown below. The goal of the interpretation is to determine the ZIP+4+2 Postnet barcode from the handwriting—the result of which is sprayed at the bottom of the envelope. This barcode is used for further sorting of the mail at each post office that it has to go through. The envelope shown [...] was among those in the first deployment of the HWAI system in Tampa, Florida in 1996.



Today, at the USPS, Remote Computer Readers (RCRs) automatically scan non-barcode letter mail for address information, match the information against the Address Management System (AMS) databases—which contains addresses only and no individual names—and imprint the mail with barcodes for processing. When the RCRs are unsuccessful at finding a match, an image of the address is sent to a Remote Encoding Center (REC) where operators manually key the address information. The results are transmitted to the facility that has the mail piece, thereby keeping it in the automated mail stream. These failures are typically due to varying address formats from patron errors such as directionals in grid addresses (e.g., SW), illegible or missing address elements and technical problems that include inserts misaligned with envelope windows.

The RCR-driven, USPS letter mail address recognition program is a major success story that has resulted in substantial cost savings for the USPS and more accurate and efficient mail delivery for US residents and businesses. During the past several years computer-based image recognition improvements have significantly reduced the amount of images requiring manual keying at the RECs. From 1996 to 2004, the encode rate for RCRs has increased from 35 percent to 90 percent, reducing the need for manual matching at RECs from 24 billion pieces per year to 6 billion annually. As a result, the USPS has been able to reduce the number of RECs in the national network from a high of 55 in 1998 to only 15 today.

Moving forward, the USPS hopes to reduce the amount of manual intervention even further. The USPS will begin testing a commercial database to improve the performance of RCR devices that scan mail for address information. Using the commercial database, the USPS hopes to improve the percentage of non-barcode mail it can process automatically. While the USPS in-house database of addresses doesn't include individual name information, the commercial database does. So, when mail compared to the AMS database fails to produce a match or produces multiple matches, the USPS plans to try to match the mail against the commercial database. For example, while mail addressed to John Doe at 123 Main St. might produce multiple matches against the AMS database (123 Main St S and 123 main St N), a comparison against the commercial database would reveal that a John Doe lives at 123 Main St. S, and a match would be made.

From the



**Greetings from
the new
Executive Committee
of the IAPR**

by [Alexandra Branzan-Albu](#),
IAPR Secretary



Victoria, January 18, 2015

It is a pleasure for me to write again for the *IAPR Newsletter*, a publication that I know well from having been its Editor during 2009-2012. This time, I write on behalf of the new ExCo, as I am honoured to be the new Secretary.

My involvement with IAPR started in August 2002, when I volunteered on the Local Arrangements Committee for ICPR in Quebec City. Since then, I have participated in many ICPR Conferences (Cambridge 2004, Hong Kong 2006, Tampa 2008, Istanbul 2010, and Stockholm 2014) as a co-author and presenter of accepted papers, and as *IAPR Newsletter* EiC. Now, I am looking forward to serving the IAPR by engaging in its governance structures. I am very thankful to learn from and follow in the footsteps of previous secretaries Ingela Nyström (the current IAPR president) and Denis Laurendeau (IAPR president 2010-2012).

The Exco is currently in the process of appointing committee members for various Standing Committees.

We are also happy to welcome two new member Societies, namely the Association of Sustainable Innovation in Tunisia (SIT) and the Malaysian Image Analysis and Machine Intelligence Association (MIAMI). These memberships were approved at the last Governing Board meeting held in Stockholm in conjunction with ICPR 2014. Their contributions to the IAPR will be greatly appreciated. Please visit the IAPR web site for a complete, up-to-date list of all our member organizations and their contact information <http://www.iapr.org/aboutus/organizations.php>.

We also welcome the two new Governing Board members: Dr. Chee Seng Chan representing Malaysia and Professor Adel M. Alimi representing Tunisia. Their contributions to the Governing Board will be much appreciated.

This is a gap year for ICPR, but preparations for [ICPR 2016 \(Cancun, Mexico\)](#) are in full swing. This will be a very exciting conference, with a great technical program. In Stockholm, the Governing Board voted on an amendment of ICPR guidelines: the technical program for future ICPR conferences should include, in addition to the K.S. Fu, J.K. Aggarwal, and Maria Petrou lectures, five plenary sessions (normally two per day) with presentations to be selected, either by invitation or from the submissions (or a mixture) at the discretion of the Technical Program Committee.

There are many interesting IAPR-supported meetings being organized in 2015. Please see the [CfP](#) and [Meeting Planner](#) sections of this Newsletter for those that have been approved as of the publication of this issue. You can also consult <http://www.iapr.org/conferences/> throughout the year.

I hope that you will find the first 2015 issue of the IAPR newsletter, skillfully prepared by Arjan Kuijper, Zeeshan Zia and Linda O’Gorman, to be a useful and enjoyable read.

On behalf of the ExCo, I wish you a prosperous and auspicious 2015!

Meeting Reports

Conferences, Workshops & Summer Schools

Biometrics 2014

11th Intl. Summer School for Advances in Biometric Authentication: Biometrics for Forensic, Security Beyond

June 9-13, 2014, Alghero, Italy

[Massimo Tistarelli](#), Director (University of Sassari, Italy)

[Josef Bigun](#), Co-director (Halmstad University, Sweden)

Enrico Grosso, Co-director (University of Sassari, Italy)

[Anil K. Jain](#), Co-director (Michigan State University, USA)

by Massimo Tistarelli, Summer School Director

Biometrics 2014 was the 11th edition of a strongly established training course started in 2003 to promote knowledge dissemination and research in Biometrics and related fields. The school was technically co-sponsored by the IAPR and the IEEE.

The school's main theme was related to the application of multimodal biometric systems in forensic and security applications. The school particularly addressed the impact of biometric technologies in criminal investigations and the algorithmic solutions to facilitate the integration of biometrics in several scenarios.

Several subjects were taught at the summer school, forming a total of 22.5 hours of theoretical lectures from 15 different lecturers and 4.5 hours of guided practical exercises using MatLab¹ tools.

¹ The school committee is grateful to Mathw-Works for providing a special trial version of MatLab software, specifically for the school students to develop the practical sessions.

The subjects ranged from fundamentals such as machine learning and pattern recognition techniques, applied to biometrics, as well as more advanced topics such as neuroscience and applied subjects such as the large scale evaluation of biometric systems and the deployment of biometrics technologies in forensics.

This 11th edition of the summer school, saw a line-up of exceptional lecturers, selected from the editorial boards of top-level scientific journals and conferences. Dr Ida Gobbini, an outstanding neuroscientist, presented a lecture about the human recognition of familiar faces as opposed to unfamiliar faces. All lecturers, among the most highly reputed experts in their fields, presented the most up-to-date view in Biometric technologies and Forensic applications.

The complete list of lecturers and the presented lectures is as follows:

- Prof. Arun Ross (Michigan State University, USA) An

introduction to biometrics and multibiometrics.

- Prof. Zhenan Sun (Chinese Academy of Science, China) Iris recognition
- Prof. Alessandro Verri (University of Genova, Italy) Machine learning techniques in biometrics.
- Prof. Andrzej Drygajlo (Ecole Polytechnique Federal de Lausanne, Switzerland) Biometrics for cybersecurity.
- Prof. Raffaele Cappelli (University of Bologna, Italy) Fingerprint recognition.
- Prof. Massimo Tistarelli (University of Sassari, Italy) Face recognition technologies.
- Dr. Thirimachos Bourlai (West Virginia University, USA) Practical biometric recognition systems and project - PART 1 and 2.
- Dr. Jonathon Phillips (NIST, USA) Grand challenges and progress in face recognition and visual biometrics.



- Prof. Alice O'Toole (University of Texas at Dallas, USA) Biological recognition of human faces.
- Prof. John Mason (University of Swansea, UK) Speaker recognition.
- Dr. Farzin Deravi (University of Kent, UK) Biometric standardization.
- Prof. Didier Meuwly (Netherlands Forensic Institute, Netherlands) Biometrics in forensic practice.
- Dr. Sami Romdhani (Safran Morpho, France) Biometric Technologies: an industrial perspective.
- Prof. Ida Gobbini (University of Bologna, Italy) Why familiar faces are special.
- Prof. Mark Nixon (University of Southampton, UK) Gait recognition and soft biometrics.
- Dr. Thirimachos Bourlai (West Virginia University, USA) Practical biometric recognition systems and project - PART 3.
- Prof. Emilio Mordini MD (CSSC Roma, Italy) Ethics and governance of global ID.

34 participants attended the school lectures. The class was formed by students coming from different universities, industries and

research centres in the following 19 different countries (in brackets are the number of participants from this country, if greater than one): Austria, Croatia, Denmark, France (2), Finland, Germany (2), Greece, Iran, Ireland, Italy (4), Netherlands (2), Norway (2), Poland (2), Portugal (2), Spain (2), Sweden, Switzerland, Thailand, United Kingdom (4), United States (2).

This year's students demonstrated a quite deep knowledge of both application and theory of biometrics. Most of them are either working directly in the design of biometric systems or are pursuing high level scientific research in the field. This not only facilitated a very good interaction between students and lecturers, even within the theoretical lectures, but also stimulated and challenged even the most experienced lecturers with questions and requests for explanations in the course of almost all presentations. As a result, both the students and lecturers were much involved in technical discussions and plans for collaborations.

All students actively took part in the practical sessions. A project was assigned to sub-groups of the class and an award was assigned to the best three projects.

Remarkably, representatives of government agencies also

attended the school courses. This not only denotes the high reputation gained by the school, but also the deep interest of different government offices in the adoption of newer biometric technologies in the service of the citizens.

A total of 11 students from different countries were partially supported by a grant from the IAPR sponsorship. The awarded students were selected on the basis of three criteria:

- Public recognition of their research record (number of publications, patents, talks at workshops and conferences, participation to previous meetings);
- Year of enrolment in the PhD program, more advanced students were privileged over younger ones;
- Active participation in the IAPR activities.

The school participants were offered the possibility to display a poster on their research activity and to submit a research paper to be orally presented at two special sessions organized during the week. The participants presented 16 posters, which were available during the entire week. Eight PhD students made an oral presentation of their on-going research work:

Petra Grd (Croatia) "Human Age Estimation Based on Craniofacial Morphology Analysis"

Mateusz Trokielewicz (Poland) "Linear regression analysis of template ageing in iris biometrics"

Andreas Nautsch (Germany) "Towards Duration Invariance of i-Vector-based Adaptive Score Normalization"

Moises Diaz-Cabrera (Spain) "Inspired Cognitive Approach for Duplicated Off-line Signature Generation"

Stamatis Samaras (Greece) "User Mobile Phone Brand and Model Identification Using Recorded

Speech Signals"

Carina A. Hahn (USA) "Contributing Factors to Human Performance on Person Recognition from Videos"

Ramin Irani (Denmark) "Improved Pulse Detection from Head Motions Using DCT"

Michiel Buil and Sandra Visser (Netherlands) "Forensic issues for Biometrics at Netherlands National Police"

12th Summer School for Advanced Studies on Biometrics for Secure Authentication:

BIOMETRICS IN FORENSICS, SECURITY AND MOBILE APPLICATIONS



Alghero, Italy
June 22-26, 2015



[Ching Suen](#), Honorary Chair (Concordia University, Canada)

General Chairs:

[José Francisco Martínez-Trinidad](#) (INAOE, Mexico)

[Jesús Ariel Carrasco-Ochoa](#) (INAOE, Mexico)

[José Arturo Olvera-López](#) (Benemérita Universidad Autónoma de Puebla, Mexico)

[Joaquín Salas-Rodríguez](#) (Instituto Politécnico Nacional, Mexico)

by The General Chairs

MCPR2014 was organized by the Computer Science Department of the National Institute for Astrophysics, Optics and Electronics (INAOE) of Mexico and the Autonomous University of Puebla (BUAP). MCPR2014 was sponsored by the Mexican Association for Computer Vision, Neural Computing and Robotics (MACVNR) and the International

Association for Pattern Recognition (IAPR).

MCPR2014 received contributions from 19 countries. In total 68 papers were submitted, out of which 39 were accepted for publication in the MCPR2014 proceedings and for presentation at the conference in a single track. The review process was carried out by the Scientific Committee, which consisted of 193 outstanding


researchers—all of whom are specialists in pattern recognition—who prepared an excellent selection.


The 39 accepted papers were published by Springer-Verlag in the volume Pattern Recognition, LNCS 8495, edited by José Francisco Martínez-Trinidad, Jesús Ariel Carrasco-Ochoa, José Arturo Olvera López, Joaquín Salas-Rodríguez, and Ching Y. Suen.


The oral sessions covered the topics: Pattern Recognition and Artificial Intelligence, Computer Vision, Image Processing and Analysis, Animal Biometric Recognition, and Applications of Pattern Recognition.

Three professors were invited to give keynote addresses and tutorials on topics in Pattern Recognition:

- Professor Ching Y. Suen, Centre for Pattern Recognition and Machine Intelligence, Concordia University, Canada, was the IAPR Invited speaker and gave a talk about "Digitization and Recognition of Various Types of Patterns" in which he shared his experiences about this topic over several real applications.


- Professor Carlo Tomasi, Department of Computer Science, Duke University, USA, gave a talk about "Tracking People".


- Professor Fazel Famili, School of Electrical Engineering and Computer Science, University of Ottawa, Canada, gave a talk about "Knowledge Discovery and Pattern Recognition: An Applied Perspective".



The last day of the conference, the invited speakers presented enlightening tutorials on several pattern recognition topics.

For the second year, MCPR included a PhD Students' Meeting that allowed discussing their research work in order to receive

feedback from experienced researchers, as well as promoting their participation in conference



events. Seven PhD contributions were carefully selected to be presented at the Conference as posters, and these contributions were also published as a special issue of the journal "Research in Computing Science" edited by the National Polytechnic Institute of Mexico.

During the event, meals and the conference dinner took place at the venue, the Grand Park Royal Cancun Caribe Hotel.

We are sure that MCPR 2014 once again provided a forum for enhancing the collaboration between the Mexican pattern



recognition researchers and the broader international pattern recognition community.

The steering committee for the MCPR decided that [MCPR 2015](#) the 7th Mexican Conference on Pattern Recognition will be held in Mexico City, Mexico, in the last week of June 2015, organized by the Center for Computing Research of the National Polytechnic Institute of Mexico.





ICVSS 2014

Sicily ~ 13-19 July

International Computer Vision Summer School

<http://svg.dmi.unict.it/icvss2014/>

Summer School Directors:

[Roberto Cipolla](#) (University of Cambridge, United Kingdom)

[Sebastiano Battiato](#) (University of Catania, Italy)

[Giovanni Maria Farinella](#) (University of Catania, Italy)



Photo by Davide Moltisanti

by The Summer School Directors

The historic island of Sicily and its beautiful sunshine played host to over 150 young researchers, selected from 280 applicants, in July for the International Computer Vision Summer School 2014. The school directors, Prof. Sebastiano Battiato and Prof. Giovanni Maria Farinella of the University of Catania, and Prof. Roberto Cipolla of the University of Cambridge, have chosen topics covering both fundamentals and applications for the eighth successive year of the highly popular series of lectures and tutorials. The school has been endorsed by IAPR and GIRPR.

The courses were delivered by world renowned experts in the

field, from both academia and industry:

- Rita Cucchiara, University of Modena, Italy
- Frank Dellaert, Georgia Institute of Technology, USA
- Andrew Fitzgibbon, Microsoft Research Cambridge, UK
- Yasutaka Furukawa, Washington University in St. Louis, USA
- Leonidas Guibas, Stanford University, USA
- Masayuki Inaba, University of Tokyo, JP
- Shahram Izadi, Microsoft Research Cambridge, UK
- Larry Matthies, NASA, USA
- Gerard Medioni, USC/Amazon, USA
- Ryuzo Okada, Toshiba Research and Development Center, JP
- Maja Pantic, Imperial College London, UK
- Florent Perronnin, Xerox Research Center Europe, France
- Marc'Aurelio Ranzato, Facebook, Menlo Park CA, USA
- Stefano Soatto, University of California, Los Angeles, USA
- Ming Yang, Facebook, Menlo Park CA, USA
- Larry Zitnick, Microsoft Research Redmond, USA

In amongst a packed program of

over 30 hours of presentations, the organizers found time for a tour of the ancient and picturesque town of Ragusa Ibla (RG) including the opportunity to experience the local traditions in the form of folk dancing and a delicious feast featuring many of the local delicacies.

Intended to provide a review in the existing state-of-the-art research, one of the greatest attractions of the school has been the opportunity for students at the start of their research careers to challenge and question both the professors and each other in an informal and relaxed setting, providing an inspirational atmosphere, a chance to improve

research skills, though activities such as the reading group, posters session, essay competition, and fostering a sense of community.

Four prizes have been assigned by the school committee. The scholarship to the best student (grant offered by Microsoft) was assigned to Francesco Verdoja, Università degli Studi di Torino, Italy. The best presentation prize (grant offered by Toshiba) was assigned to Jake Snell, University of Toronto, Canada. The winner of the essay competition (grant offered by OrCam) was assigned to Laura Cabrera-Quirós, Delft University of Technology, The Netherlands. The reading group prize (\$1000) has been assigned

to Daniel Herrera C., University of Oulu, Finland.

As students prepared for the closing ceremony and an evening party at the beach, many students express their desire to get back to the lab to test out new ideas and look forward to next year's school which will be announced soon in December 2014.

All the information about ICVSS are available at <http://www.dmi.unict.it/icvss>.



General Chair:

[Pasi Fränti](#) (University of Eastern Finland, Finland)

SPR Chairs:

[Gavin Brown](#) (University of Manchester, UK)

[Marco Loog](#) (Delft University of Technology, The Netherlands)

SSPR Chairs:

[Francisco Escolano](#) (University of Alicante, Spain)

[Marcello Pelillo](#) (University of Venice, Italy)

by Pasi Fränti, General Chair

Introduction

S+SSPR is two track workshop organized every two years the week before ICPR. Last time it was 2012 in Miyajima near Hiroshima. This was the first time it took place in Joensuu, Finland, a country of 5.4 million people, 187,888 lakes and 2 million saunas.

The workshops were organized by Technical Committees TC1 and TC2 of IAPR, which focus

on Structural, Syntactic and Statistical Pattern Recognition. The workshops were characterized by two things: participants who were highly devoted to the methodology research of pattern recognition and the idyllic down-to-earth atmosphere of the event.

Scientific Program

Scientific program was constructed by the track chairs: Gavin Brown (UK), Marco Loog (The Netherlands), Francisco Escolano (Spain) and Marcello Pelillo (Italy)

<http://cs.uef.fi/ssspr2014/>



based on 78 submitted papers, or which 53 were accepted. The presentations consisted of 47 regular papers and 6 journal track submissions, which were clustered into twelve oral and one poster sessions.

Prof. Ali Shokoufandeh (US) gave a keynote on approximation of hard combinatorial problems via embedding to hierarchically separated trees, and Prof. David Hand (UK) on evaluating supervised classification methods: error rate, ROC curves, and beyond.

There were 65 registered participants from 21 countries. Since the workshop was organized prior to ICPR (Stockholm), the program was purposely designed to have a relaxed schedule, including plenty of social and outdoor time that gave good opportunities to meet others and have informal discussions



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Social Program

The welcome reception was

organized at Joensuu Polar Bear Club with the possibility to have a sauna and swim in the lake, very Finnish things to do. Most participants also took part in the bicycle sight-seeing tour prior to the sauna event.



The rest of the social program was flavoured by outdoor activities such as hiking in Koli, or even jogging for those interested, and the possibility to practice tango and waltz manoeuvres



on the banquet dance floor. These had two motives: they allowed participation instead of just observing, and a little bit exercising can be good for stimulating the brain in order to solve new pattern recognition puzzles.



Sessions

The keywords listed below were the most frequently used

and therefore selected here to represent S+SSPR 2014, in general. Among the sessions, the keynotes were most appreciated according to post-conference feedback query, then Partial Supervision, Clustering, Metrics and Dissimilarities. The social program in general was highly appreciated due to its down-to-earth spirit. Nothing fancy, just good fun!"

Image Understanding	18
Dimensionality Reduction	11
Graph-theoretic Methods	10
Structural Matching	10
Syntactic Pattern Recognition	9
Multiple Classifiers	9
Model Selection	7
Shape Analysis	7
Clustering Algorithms	6
Image Document Analysis	6
Comparative Studies	6
Multimedia Analysis	6
Novelty Detection	5
Spectral Methods	5
Structural Kernels	5
Spatio-Temporal Pattern Recognition	5

We don't expect to have sauna in 2016, but the climate can serve as good substitute. Hope to see you all in S+SSPR 2016, Mexico! ☺

**S+SSPR 2016
will take place
the week before
ICPR 2016
in
Cancun, Mexico**

www.icpr2016cancun.mx



More details about both of these conferences to come in forthcoming issues of the *IAPR Newsletter* and at the IAPR web site:

www.iapr.org/conferences/



PRIB 2014 **The 9th IAPR Conference on Pattern Recognition in Bioinformatics**

August 21-23 2014, Stockholm, Sweden

<http://prib2014.scilifelab.se/>

General Chair:

[Lukas Käll](#) (Royal Institute of Technology - KTH, Sweden)

by Lukas Käll

PRIB 2014 was held at the [Science for Life Laboratory](#), Stockholm, Sweden, as a satellite conference for the [ICPR](#), which was held at a different location (see the [ICPR 2014 Special Issue](#) of the *IAPR Newsletter*, October 2014). This year the conference was sponsored by the Swedish Bioinformatics organisation Bioinformatics Infrastructure for Life Sciences (BILS; <http://bils.se>). The PRIB conference series aims to bring together researchers, practitioners and students from around the world to present and discuss methods and applications of pattern recognition in the field of bioinformatics to solve problems in the life sciences.

35 manuscripts were submitted to the PRIB 2014 conference, out of which 18 were accepted and selected for oral presentation. The geographical spread of the contributions was exemplary, actually stemming from all the inhabited continents of the world. The distribution of the first corresponding authors of the accepted contributions are displayed in Figure 1.

The accepted contributions were published by Springer in the subseries [Lecture Notes in Bioinformatics \(LNBI\), Volume](#)



Figure 1: Geographical spread of the first corresponding authors

[8626](#). Eight of the accepted manuscripts which obtained the best review score only appeared in the form of abstracts in the LNBI proceedings, and will instead appear as full length articles in the Supplements of the BMC Bioinformatics (IF 2.672) to be published by March 2015.

The conference featured three keynote speakers, all experts on pattern recognition within bioinformatics.

- Manfred Claasen (ETH Zürich), "Multiscale models of biological systems at single cell resolution".
- Jens Lagergren (Royal Institute of Technology),



Click above to go the publisher's web site for this volume.

"Probabilistic analysis of gene evolution"

- Samuel Kaski (Aalto University), "Learning from multi-modal data: integration, data translation and drug sensitivity prediction"

The PRIB also included three tutorials:

- Visakan Kadirkamanathan (University of Sheffield), "Data driven modelling at molecular, cellular and organ scales"
- Elena Marchiori and Twan van Laarhoven (both at Radboud University Nijmegen), "Network Drug Target Interaction prediction"
- Raj Acharya (Penn State University), "Reconstructing Viral Haplotypes"

The 35 delegates enjoyed a social program that included a welcome dinner at the Science for Life Laboratory, and we also made an dinner cruise with S/S Stockholm out into the Stockholm archipelago.

Many people contributed to the success of the conference, the organizing committee specially want to thank the sponsor (BILS), the volunteer students, the keynote speakers and the authors. We conclude that the PRIB 2014 was a great success, both scientifically and socially.



[DGCI 2014](#)

18th IAPR International Conference on Discrete Geometry for Computer Imagery

September 10-12, 2014, Siena, Italy
<http://www.dgci-conference.org/>



General Chairs:

[Elena Barcucci](#) (University of Firenze, Italy)
[Andrea Frosini](#) (University of Firenze, Italy)
Simone Rinaldi (University of Siena, Italy)

by the General Chairs

DGCI 2014 was jointly organized by the researchers in Discrete Mathematics of the Universities of [Siena](#) and [Firenze](#).

The aim of the DGCI conference series is to gather researchers in discrete geometry and topology, and discrete models, with applications in image analysis and image synthesis. Discrete geometry plays an expanding role in the fields of shape modelling, image synthesis, and image analysis. It deals with topological and geometrical definitions of digitized objects or digitized images and provides both a theoretical and computational framework for computer imaging.

As in the previous editions, the Conference attracted researchers from different countries, attesting to the international relevance of the event. After an accurate reviewing process that, from this edition, supported the decisions with a final rebuttal phase, 34 papers were accepted, out of about 60 submissions. The

reviewing process was coordinated by the Chairs, the 12 members of the [Steering Committee](#), and the 22 members of the [Program Committee](#).

The [program](#) consisted in 22 papers scheduled in a single-track of oral presentations that were organized in topical sections on

- Models for Discrete Geometry (2 papers);
- Discrete and Combinatorial Topology (2 papers);
- Geometric Transforms (3 papers);
- Discrete Shape Representation, Recognition and Analysis (5 papers);
- Discrete Tomography (4 papers);
- Morphological Analysis (2 papers);
- Discrete Modelling and Visualization (2 papers);
- Discrete and Combinatorial Tools for Image Segmentation and Analysis (2 papers).

The remaining 12 papers on these same topics were grouped into a

single poster session. As in the last two editions, the Conference also included a [demonstration session](#), with the intent of providing the opportunity to present and share effective applications, new tools and libraries related to the mainstream of the image processing.

Three internationally well-known researchers provided [invited lectures](#):

- [Prof. Peter Gritzmann](#) - Technische Universität of München, Germany: *On discrete Inverse problems: theory, algorithms and applications*
- [Prof. Lorenzo Robbiano](#) - University of Genova, Italy: *Algebraic Schemes and Images*
- [Prof. Marco Gori](#) - University of Siena, Italy: *Learning to see like babies*

During the Gala Dinner, the [IAPR Best Paper Award](#) was given to Sara Brunetti, Paolo Dulio and Carla Peri for the paper "Non-additive bounded sets of



uniqueness in \mathbb{Z}^n ". The winner was selected by the Chairs and the members of the Steering and Program Committees from among all the papers, and the motivation can be summarized as follows:

This edition of DGCI Conference has been characterized by a large number of high quality papers in the field of Discrete Tomography. Among them, this one concerns the uniqueness of the reconstruction process from a finite set of views of objects on a finite sized grid in three or more dimensions.

The paper is theoretically solid, and it brings light to a conjecture of Attila Kuba, reported by Peter Gritzmann et al. in 2011, by studying the existence and the number of 3D non-additive sets uniquely determined by projections.

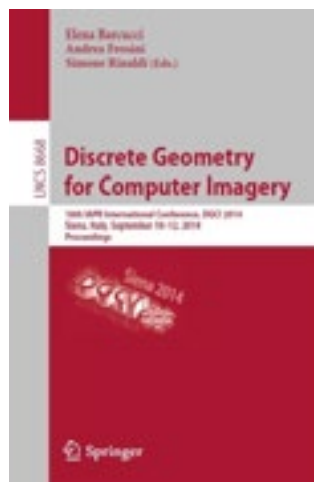
The found results show both interesting theoretical developments, and practical consequences, as the reconstruction from sparse (minimal x-ray dose) additive sets becomes feasible, using linear programming methods, in polynomial time.

DGCI 2014 was supported by the [International Association](#)

[for Pattern Recognition](#) (IAPR), and it constitutes the main event associated with the IAPR [Technical Committee \(TC-18\) on Discrete Geometry](#), and by the [Gruppo Nazionale per il Calcolo Scientifico](#) (GNCS), one of the groups of the [Italian Istituto Nazionale di Alta Matematica "F. Severi"](#).

We would like to mention the [Dipartimento di Matematica ed Informatica](#) of the University of Firenze, and the [Dipartimento di Ingegneria dell'Informazione e Scienze Matematiche](#) of the University of Siena who hosted the Conference and provided all the necessary facilities.

The proceedings of the meeting have been published by Springer, in the [Lecture Notes in Computer Science series, Volume 8668](#), Elena Barucci, Andrea Frosini, and Simone Rinaldi, Eds.



Click above to go the publisher's web site for this volume.

An open call for a special issue of the international journal [Theoretical Computer Science](#) related to the topics of the Conference is also scheduled. The authors of the papers presented at the Conference are requested to submit a substantially new version of their papers, both in terms of scientific contents and presentation.

The DGCI 2014 edition was successfully carried on, and this has to be credited to the contribution of many people: we are deeply grateful to the members of the Steering Committee for its invaluable support and inspiring discussions, and to the local Organizing Committee for its tireless work. Special thanks to the authors of the submitted papers whose research confirmed the high level standard of the Conference, to the Program Committee and all the reviewers for their accurate and proficient work, and to all the participants attending the conference, who mainly contributed to make this event a success.

[IAPR TC18](#)
[Discrete Geometry](#)

The aim of this IAPR-Technical Committee is to promote interactions and collaboration between researchers working on discrete geometry.



2nd International Joint Conference on Biometrics

September 29-October 2, 2014, Clearwater, Florida, USA

www.ijcb2014.org

Honorary Charis:

[Anil Jain](#) (Michigan State University, USA)

[Tieniu Tan](#) (Institute of Automation, Chinese Academy of Sciences, China)

General Chairs:

[Josef Kittler](#) (University of Surrey, UK)

[Ajay Kumar](#) (The Hong Kong Polytechnic University, Hong Kong)

[Sudeep Sarkar](#) (University of South Florida, USA)

by Ajay Kumar, General Co-chair

The IEEE/IAPR International Joint Conference on Biometrics series combines two major biometrics research annual conferences; the Biometrics Theory, Applications and Systems (BTAS) conference from IEEE Biometrics Council and the International Conference on Biometrics (ICB) which is the flagship conference of the [IAPR-TC4 on Biometrics](#). This conference was held in a beach resort in Florida and attracted over 200 participants from academia, industry, research institutions and government bodies.

This year, the conference received 261 paper submissions. With great help from over 150 reviewers and 21 area chairs, the PC Chairs managed the review process by ensuring at least three reviews per paper and accepted 25 papers for 6 oral sessions and 55 papers for 3 poster sessions. The process included a useful rebuttal stage where about 85% of the authors replied to reviewer comments, often leading to an adjustment of the final paper scores. Based on the Area Chairs' recommendations, the PC Chairs deliberated on all the submissions, except for those co-chaired by a PC Chair or a

General Chair. The latter types of papers were handled offline by non-conflicting General Chairs (for papers co-authored by PC Chairs) or PC Chairs (for papers co-authored by a General Chairs).

The IJCB 2014 [program](#) schedule encompassed a broad range of topics from various research groups around the world. The presentations covered the main topics in Biometrics spanning from traditional to emerging themes such as the issues related to the deployment of biometrics in large scale ID programs and the efforts to acquire usable biometric samples in critical conditions.

The paper presentations were complemented with 4 invited [tutorial talks](#) offered by distinguished researchers. The tutorial topics were chosen to emphasize the most mature and widely deployed biometrics technologies and best practices. The tutorial speakers were Jianjiang Feng (*Latent Fingerprint and Palmprint Recognition*), Jiwen Lu (*Metric Learning for Face Analysis*), Kevin Bowyer (*Iris Recognition: From Basics to Research Frontiers*) and Norman Poh (*System Design and Performance Assessment: A Biometric Menagerie Perspective*).

Distinguished keynote speakers at IJCB 2014 were Hitoshi Imaoka, NEC (Japan) and Mark Burge, IARPA (USA). Hitoshi Imaoka delivered the **IAPR 2014 Biometrics Lecture** titled '[Face Recognition: Beyond the Limits of Accuracy](#)'. He presented an overview of real life covariates influencing the face recognition algorithms. The face recognition algorithm developed by him has been evaluated with the highest accuracy in the still face track of Multiple-Biometric Evaluation 2010 carried out by the National Institute of Standards and Technology (NIST). Mark Burge from Intelligence Advanced Research Projects Activity (IARPA) delivered an invited talk titled '*Face Recognition: Pushing the Boundaries*'.

IJCB 2014 also witnessed a panel session on *Promoting High Quality Research in Biometrics: Challenges and Mechanisms*. This panel session was chaired by Anil Jain (Michigan State University) and included Stan Li (Chinese Academy of Sciences), Davide Maltoni (University of Bologna), and Rob Rowe (Lumidigm).

There was also a special session on National ID Programs as well as a session reporting the

results of four biometric algorithm competitions that were held in conjunction with this conference. The speakers at the National ID Programs session included Vijay S Madan ([Digital ID for Benefit and Service Delivery to Billion Plus People](#)) from UIDAI (India), Shukri Ali Al Braiki ([The UAE Population Register and ID Card Program: Achievements and the Challenges Ahead](#)) from EIDA (UAE), and Sara Lenharo ([Brazilian National Biometric Selection: New and Legacy Challenges](#)) from RIC (Brazil). This session was chaired by Kevin Bowyer (University of Notre Dame).

A panel session on Large Scale Identification was also organized in conjunction with this conference. This panel session was chaired by [Nalini Ratha](#) (IBM) and included [Michael Garris](#) (NIST), Stéphane Gentric (Morpho), [William G. Mckinsey](#) (FBI), Mark Burge (IARPA), and [Charles Y. Li](#) (IBM).

IJCB 2014 received generous support from several organizations without which this conference would not have been possible. In particular, support from Lumidigm, Safran Morpho, Nielsen, 3dMD, Cognitec, Cross Resolve, Digital Signal Corporation, Integrated Biometrics, Morgan & Claypool, SRI International and Springer were much appreciated and acknowledged. Conference organizers also provided IAPR Travel Stipends to 10 participants of the Doctoral Consortium. The [Doctoral Consortium](#) also had a poster session and a Best Presentation Award which was delivered to Gaurav Goswami (IIIT Delhi).

A biometrics quiz titled *Who Wants to be (biometrics) Millionaire* had enthusiastic participation across the dinner tables and was organized by Mark Nixon (University of Southampton) and

Mayank Vatsa (IIIT Delhi).

Awards

- The **BTAS Best Paper Award** was given to Laurent El Shafey, Elie Khoury and Sébastien Marcel (all from Idiap Research Institute) for their paper titled *“Audio-Visual Gender Recognition in Uncontrolled Environment Using Variability Modeling Techniques”*.
- The **Five Year Highest Impact Paper Award for a BTAS Paper** was given to Unsang Park, Arun Ross, and Anil Jain, for their paper *“Periocular Biometrics in the Visible Spectrum”* presented in BTAS 2009.
- The **IAPR 2014 Senior Biometrics Investigator Award (SBIA)** was presented to Anil Jain (Michigan State University).



Anil Jain receiving the IAPR 2014 SBIA from Massimo Tistarelli, Chair of the IAPR TC4 on Biometrics

- The **IAPR 2014 Best Biometrics Student Paper Award (BBSPA)** was awarded to Bin Yang, Junjie Yan, Zhen Lei, and Stan Li, for their paper titled *“Aggregate Channel Features for Multi-view Face Detection”*.



Stan Li accepting the IAPR 2014 BBSPA from Massimo Tistarelli on behalf of Bin Yang

- The **IJCB 2014 Best Reviewers Awards** were presented to Kevin Bowyer, Anil Jain, Alice O'Toole, BVK Vijaya Kumar, Hugo Proenca, Oleg Komogortsev, Maria De Marsico, Kiran Balagani, Walter Schirer, Chi-Ho Chan, and Shengcai Liao.
- The conference participants also voted for the best poster presentations. **IJCB 2014 Best Voted Poster Awards** were awarded to (i) Christian Rathgeb, Andreas Uhl, and Peter Wild for their paper titled *“Effects of Severe Image Compression on Iris Segmentation Performance”* on the first day, (ii) Anush S, Prateekshit Pandey, Mayank Vatsa, and Richa Singh for their paper titled *“On Latent Fingerprint Minutiae Extraction using Stacked De-noising Sparse AutoEncoders”* and Peter Wild, Petru Radu, Lulu Chen, and James Ferryman for their paper titled *“Towards Anomaly Detection for Increased Security in Multibiometric Systems: Spoofing-resistant 1-Median Fusion Eliminating Outliers”* on second day, and (iii) Ajita Rattani and Arun Ross for their paper titled *“Automatic Adaptation of Fingerprint Liveness Detector to New Spoof Materials”* on final day of the conference.

**IJCB 2014
proceedings are
available through
[IEEEXplore](#)**

BOOKSBOOKSBOOKS

Euclidean Shortest Paths: Exact or Approximate Algorithms by Fajie Li and Reinhard Klette

Springer, 2011

<http://www.springer.com/computer/theoretical+computer+science/book/978-1-4471-2255-5>

Reviewed by [Arindam Biswas](#)
(Indian Institute of Engineering Science and Technology, Shibpur, India)

This book presents selected algorithms for the exact or approximate solution of several variants of the Euclidean shortest path problem (ESP). It also covers a class of algorithms (called rubberband algorithms) which originated from a proposal for calculating minimum-length polygonal curves in cube-curves. The book is divided into four parts.

- Part I provides the basic definitions and introduces the class of algorithms called Rubberband Algorithms (RBAs) that play a central role in the rest of the book.
- Part II deals with the algorithms that focus on computing the exact or approximate shortest paths in the plane, whereas,
- Part III presents the algorithms to find shortest paths in 3D space which can be surface, interior of a simple polyhedron or a union of cubes.
- Several applications of rubberband algorithms in solving art gallery problems such as safari, zoo-keeper, or watchman route problem are presented in Part IV.

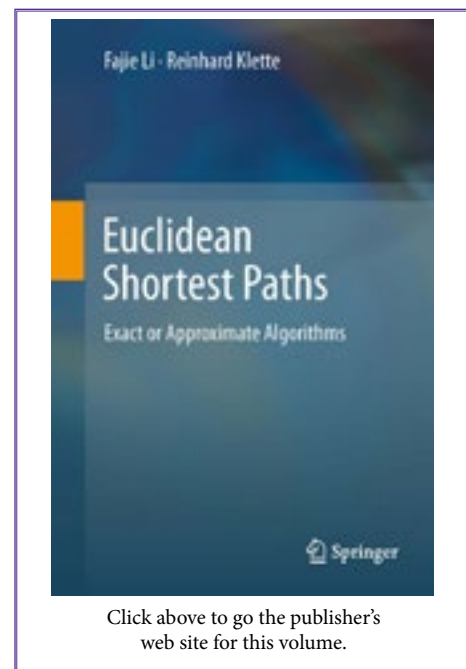
The topics have been organized

in an interesting manner, starting with the useful preliminaries followed by Euclidean Shortest Paths in the plane, 3D space, and an interesting treatise of some art gallery problems using the rubberband algorithms.

The audience of this book can be undergraduate students where it can serve as an auxiliary textbook for an algorithm course. The book will be immensely useful for researchers because the theoretical rendition of the algorithms are wonderful. It will also be a very useful reference for practitioners in industry where various applications of shortest path problems are in the focus. Although the title of the book may not appear to be general, the contents and the style of presenting the algorithms should attract a diverse range of readers.

The four parts of the book consist of 12 Chapters in total. Following Part I, which consists of the fundamentals, every other part of the book can be read independently. Each Chapter of the book, in general, starts with a brief introduction, followed by theoretical discussions, and ends with problems, notes on the chapter, and references.

The basics presented in the first two chapters are in one of the most readable forms I have ever seen. Even in these chapters, the problems presented at the end will really motivate the students and researchers to understand the basics. It is justified that Chapter 3 is dedicated to the rubberband algorithms which has an all-embracing presence in the whole of the book (truly like a



rubberband). These three chapters indeed do justice to laying down the foundation.

In this book, Euclidean shortest paths are nicely connected with the convex hulls, which makes it an interesting reading and introduces the readers to some of the wonderful algorithms like the Graham, Sklansky, or Klette algorithms, and a rubberband algorithm. Chapter 5 is a precursor to Chapter 6 where the authors have done a good job in presenting a discussion on Chazelle's algorithm for polygon trapezoidation and Mitchell's algorithm for solving the continuous Dijkstra problem. In Chapter 6, the Chazelle algorithm and RBAs are presented to find the ESP between two points inside a simple polygon. It is quite interesting to experience in what a concise way the authors have presented how the approximate RBA can be converted into an exact algorithm.

The genesis of the RBAs lies in a solution proposed for solving a Euclidean shortest path problem, namely, to calculate a shortest path in a simple cube-curve in 3D space. Shortest paths in 3D space involve finding the shortest path between two points on the surface of a simple polyhedron (two RBAs for this problem are presented in Chapter 7), in the interior of a simple polyhedron (an approximate algorithm presented in Chapter 8), and in a union of cubes (RBA in Chapter 9). The detailed presentation on RBAs in Chapter 9 may be a little daunting for a general reader, however, the discussions and analyses stemming from the lemmas and theorems have been presented in a lucid way as far as possible.

Part IV is also an important component of the book and it presents the application of Rubberband Algorithms in solving several art gallery problems

such as the safari, zookeeper, or watchman route problem (relevant to industry also). An algorithm to tame the fixed touring-polygon-problem and another approximate algorithm to solve the floating touring-polygon-problem are presented in Chapter 10 along with experimental results. The authors claim that the RBA for the watchman route problem is easier to comprehend and implement. The RBA for the zookeeper route problem is presented in the concluding chapter.

It is worth mentioning here that the notes at the end of each chapter of this book will serve as precious pointers for the enthusiastic readers. Also, it should be appreciated that the problems presented in each chapter have been designed with varying complexities, keeping in mind the diverse types of readers. Some of the more obvious proofs have been tacitly omitted in the

main text and have been posed as a problem which, in my opinion, is a good way of sustaining the attention of a reader.

The book presents real life examples, shown in many diagrams, such as the images in Bertel Thorvaldsen's Museum in Copenhagen or the rubberband around Taiwanese chopsticks. The authors have used many good quality diagrams to illustrate the complex issues which go a long way in leaving a lasting impression in the readers' mind.

Lastly, the quotes at the beginning of each chapter are indeed soothing to the mind and thought provoking too. The book has been successful in addressing the Euclidean Shortest Path problems by presenting exact and approximate algorithms in the light of rubberband algorithms, and will be immensely useful to students and researchers in the area.

Guide to Medical Image Analysis: Methods and Algorithms

by Klaus D. Toennies

Springer, 2012

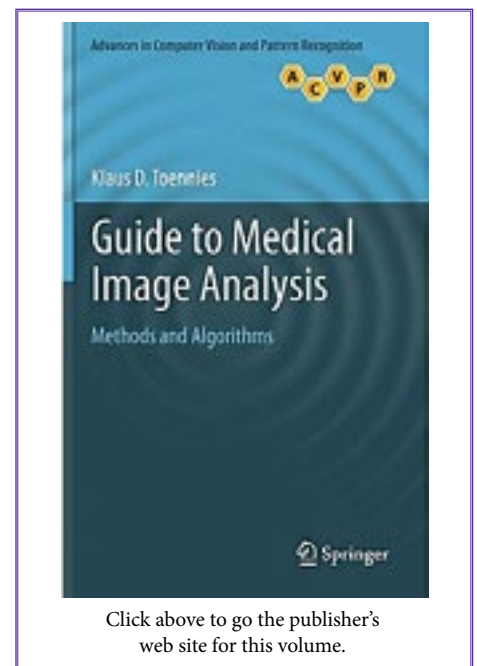
<http://www.springer.com/computer/image+processing/book/978-1-4471-2750-5>

Reviewed by [Alexandra Branzan Albu](#) (University of Victoria, British Columbia, Canada)

Good textbooks on Medical Image Analysis are hard to find. This is because it is difficult to argue that the analysis of medical images is different from generic image analysis. The student needs to learn to design algorithms that fit the context of a particular application, in our case medical imaging. But all computer vision/image processing problems are application-oriented. So what is

unique about medical imaging? What are the main challenges in medical imaging? What computer vision/image processing algorithms are specifically tailored to medical images? There are key questions that a good textbook (and a good course) in medical image analysis should address.

In the preface of *Guide to Medical Image Analysis*, Klaus Toennies pledges a 'single comprehensive view on the subject', and an application-oriented structure. He also suggests several course syllabi geared to different audiences (medical professionals, undergraduate engineering students, and graduate engineering students). It would have been great to be provided with a rationale for each syllabus, focusing more on why and how we should teach a particular topic,



rather than on the list of topics to teach.

Chapter 1 focuses on the role of image analysis in the clinical workflow. It is a very good idea to

start the book with such a chapter, since it provides students with contextual knowledge and it helps them understand the big picture of image-guided health care applications. It also helps them make sense of the critical role that software/electrical/biomedical engineers play in this workflow. However, the image processing example presented at the end of the chapter is very difficult to understand for a student who is just starting this course.

Chapter 2 is dedicated to the physics of medical imaging. All modalities (X-Ray, ultrasound, MRI, nuclear imaging etc.) are presented in this chapter, making it somewhat bulky. Combining all modalities in one chapter suggests that the physical processes underlying image acquisition are somewhat similar, which is false. This also leaves little room for summarizing modality-specific information, comparing among modalities, and discussing modality-specific artifacts. The exercises presented at the end of the chapter test only the factual knowledge and the ability to memorize concepts. There are no numerical or computer-based exercises.

Chapter 3 discusses image storage and transfer, and provides a detailed description of the DICOM image format. One may question the usefulness of such a chapter in a book about image analysis, since it seems to belong more to the field of health informatics. It would also be very useful to mention that Matlab provides functionality for reading DICOM files and for extracting only the image data from this type of file. This chapter

is perhaps intended to make the transition from the description of various imaging modalities, and their associated principles of image formation towards the medical image processing part. However, the chapter fails to link these two topics together.

The second part of the textbook (Chapters 6 to 13) follows the standard format of any computer vision textbook. Image enhancement techniques are discussed in Chapter 4, followed by feature detection in Chapter 5. Basic segmentation techniques are covered in Chapter 6, followed by more advanced concepts presented in Chapter 7 (segmentation as clustering in the feature space), Chapter 8 (graph-based segmentation), and Chapter 9 (active contours). Chapter 10 is dedicated to image registration. Oddly enough, Chapter 11 returns to the segmentation topic and presents concepts that range from very basic (e.g. Hough Transform and template matching) to rather advanced and mathematically involved (e.g. mass spring models). One may wonder why active shape models are presented in Chapter 11 and not grouped together with the very similar concept of active contours presented earlier in Chapter 9. Chapter 12 is about supervised and unsupervised classification techniques. There are clear links and some overlap between Chapters 7 and 12, so the reader is left wondering about the author's choice of conveying similar information in two different chapters. Chapter 13 covers experimental validation, which is a critical topic in medical image analysis. Validation is discussed

for both detection and registration tasks, and the probabilistic framework of validation is presented well. Another strength of the chapter is the presentation of ground truth data for real images and for phantoms, which are specific to the field of medical imaging. The last chapter is an appendix about mathematical aspects for some of the algorithms presented in the book.

One major issue about the second part of this book (Chapter 6 to 13) is the lack of specific examples from the medical imaging field. All techniques and algorithms are presented at a very generic level, without case studies on medical imaging applications. The exercises at the end of each chapter are not usable for exams, quizzes, or assignments, since they do not provide the opportunity for hands-on experience with medical images.

To conclude, the book is a laudable effort to summarize all concepts and techniques that are currently in use in medical image analysis. However, it is hard to argue that the book has reached the level of cohesiveness, clarity, simplicity and practical hands-on knowledge that form the basic attributes of a great textbook on image analysis.

About the reviewer: Alexandra Branzan Albu is an Associate Professor at the University of Victoria, British Columbia, Canada. She teaches courses on medical image processing and computer vision at undergraduate and graduate levels. More information about her teaching and research can be found at <http://www.ece.uvic.ca/~aalbu/>.

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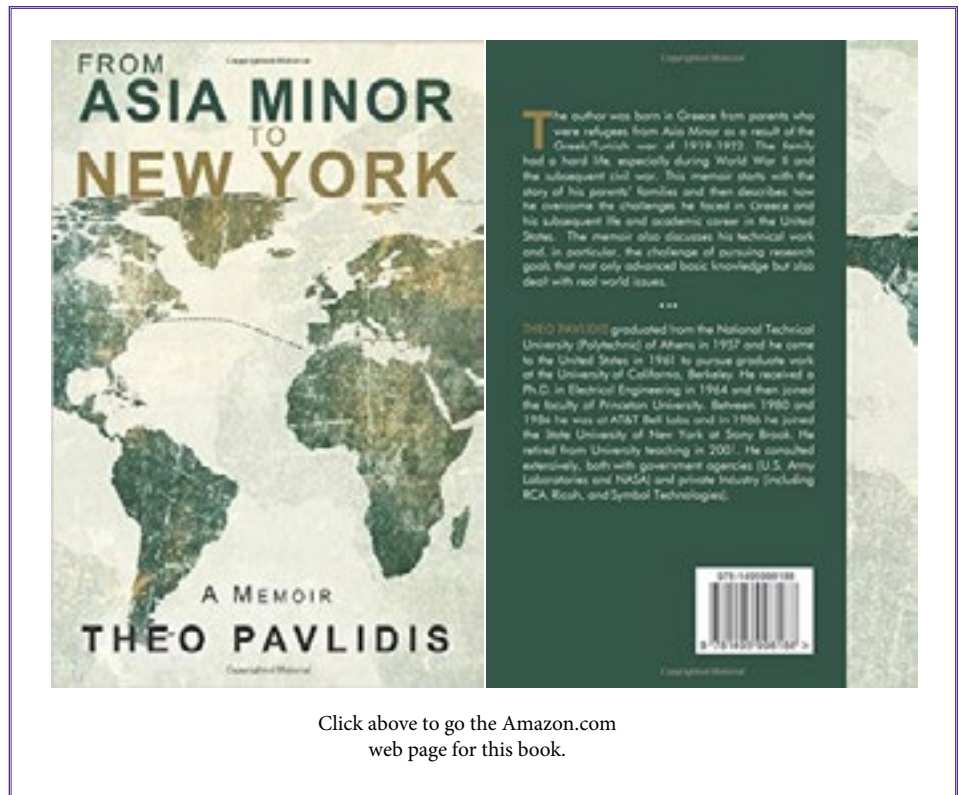
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Reviewed by [Rangachar Kasturi](#) (University of South Florida, Florida, USA)

In this book, Professor Pavlidis has weaved a fascinating story of the world events that shaped his early life, the system of education and bureaucracy in Greece, his early days in the United States as a student at Berkeley followed by his half a century of extraordinary personal and professional life. Embedded within this are the description of events that led to the formation of the IAPR, his leadership and contributions to the pattern recognition activities at the IEEE Computer Society and Transactions on Pattern Analysis and Machine Intelligence.

The 240 page book is comprised of 15 short chapters, 2 appendices, and two sets of photos. The first 12 chapters are organized chronologically and the last three are devoted to specific themes. Three chapters designated as dealing with technology contain descriptions of his many contributions to image processing, graphics, and pattern recognition technologies.

The book begins with a chapter on his family history which includes an excellent summary of early 20th century history of the Asia Minor region (part of modern Turkey). In this and the next chapter, Theo narrates the untold miseries suffered by many families including his grandparents and parents during the Greek-Turkish war, the infamous population exchange and the Second World War. He



Click above to go the Amazon.com web page for this book.

shares his teenage mischiefs, love and appreciation of his mother and her pragmatic approach, and the antiquated equipment at his undergraduate institution in the next two chapters. The story takes an interesting turn in Chapter 5 when Theo joins the Greek Army to serve the required two years of service. It is here we learn how Theo cleverly tricked an Army Major into allowing him to have his hair half an inch longer than the regulation and his amusing assignment as an editor supervising young women translators of American Technical Manuals into Greek. I wonder how well this job prepared him to serve as the Editor-in-Chief of PAMI!

The remainder of the book provides an insight into Professor Pavlidis' research interests, his many accomplishments and those of his advisees, his professional service to the IAPR and the IEEE, and, more importantly, his personal and family life. The book includes a number of illustrations, many family photos, and photos of key

events including a rare photo of Professors Herb Freeman, King-Sun Fu, Toshiuko Sakai, and Theo Pavlidis at the 3rd IJCP, 1978, in Kyoto, Japan.

As someone who has known Theo since the 1980s and having been a part of many of the activities that he describes, it was hard to put the book down once it arrived in my mailbox. I couldn't wait to read the next chapter and the one after that, and so I kept skipping ahead and then had to return to earlier stories to enjoy his narration; I wished I could read it in parallel! At the recent ICPR, Professor George Nagy and I spent an entire evening discussing this book. I am sure that for many from my generation reading this book will be an equally enjoyable, nostalgic experience, and for those from the younger generation, it will be an excellent introduction to the trials and tribulations of an outstanding educator, researcher, leader, and above all a loving family man.

BOOKSBOOKSBOOKS

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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](#), Associate Editor for Book Reviews

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- * **Advances in Embedded Computer Vision** by Branislav Kisačanin and Margrit Gelautz (ISBN 978-3-319-09386-4): <http://www.springer.com/computer/image+processing/book/978-3-319-09386-4>
- * **Video Text Detection** by Tong Lu et al. (ISBN 978-1-4471-6514-9): <http://www.springer.com/computer/image+processing/book/978-1-4471-6514-9>
- * **Computer Vision and Machine Learning with RGB-D Sensors** by Ling Shao et al. (ISBN 978-3-319-08650-7): <http://www.springer.com/computer/image+processing/book/978-3-319-08650-7>
- * **Handbook of Biometric Anti-Spoofing** by Sébastien Marcel et al. (ISBN 978-1-4471-6523-1): <http://www.springer.com/computer/communication+networks/book/978-1-4471-6523-1>

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- * **Advanced Video Coding Systems** by Wen Gao and Siwei Ma (ISBN 978-3-319-14242-5): <http://www.springer.com/computer/theoretical+computer+science/book/978-3-319-14242-5>
- * **Visual Cryptography for Image Processing and Security** by Feng Liu and Wei Qi Yan (ISBN 978-3-319-09643-8): <http://www.springer.com/computer/image+processing/book/978-3-319-09643-8>
- * **Natural User Interfaces in Medical Image Analysis** by Marek R. Ogiela and Tomasz Hachaj (ISBN 978-3-319-07799-4): <http://www.springer.com/computer/image+processing/book/978-3-319-07799-4>
- * **Fusion in Computer Vision** by Bogdan Ionescu et al. (ISBN 978-3-319-05695-1): <http://www.springer.com/computer/image+processing/book/978-3-319-05695-1>
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- * **Biometrics in the New World** by Julian Ashbourn (ISBN 978-3-319-04158-2): <http://www.springer.com/computer/image+processing/book/978-3-319-04158-2>
- * **Image Blending Techniques and their Application in Underwater Mosaicing** by Ricard Prados, Rafael Garcia, and László Neumann (ISBN 978-3-319-05558-9): <http://www.springer.com/computer/image+processing/book/978-3-319-05558-9>



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1. [Airborne and Terrestrial Laser Scanning](#) by George Vosselman, Hans-Gerd Maas (Whittles Publishing, 2010). Reviewer: Giuseppe Maino. Under review since February 2010.
2. [Support Vector Machines for Pattern Classification, 2nd Ed.](#), by Shigeo Abe (Springer, 2010). Reviewer: Huthaifa Abderahman. Under review since July 2013.
3. [Concise Computer Vision](#) by Reinhard Klette (Springer 2014). Reviewer: Tayyab Naseer. Under review since February 2014.
4. [Decision Forests for Computer Vision and Medical Image Analysis](#) by Antonio Criminisi and Jamie Shotton, Eds. (Springer 2013). Reviewer: Zeeshan Zia. Under review since April 2014.
6. [Imaging Spectroscopy for Scene Analysis](#) by Antonio Robles-Kelly and Cong Phuoc Huynh (Springer 2013). Reviewer: Tanish H. Zaveri. Under review since August 2014
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* Asterisks denote non-IAPR events *

	Meeting	Previous edition	Venue
2015	MAR CCIW 2015 : Fifth Computational Color Imaging Workshop	CCIW 2013	France
	MAY GbR 2015 : 10th IAPR TC-15 Workshop on Graph-based Representations in Pattern Recognition	GbR 2013	China
	MAY MVA 2015 : 14th IAPR International Conference on Machine Vision Applications	MVA 2013	Japan
	MAY ICB 2015 : 8th IAPR/IEEE International Conference on Biometrics	ICB 2013	France
	JUN SCIA 2015 : 19th Scandinavian Conference on Image Analysis	SCIA 2013	Denmark
	JUN Biometrics 2015 : 12th Summer School for Advanced Studies on Biometrics for Secure Authentication: Biometrics in Forensic, Security and Mobile Applications	Biometrics 2014	Italy
	JUN MCS 2015 : 12th International Workshop on Multiple Classifier Systems	MCS 2013	Germany
	AUG ICDAR 2015 : 13th International Conference on Document Analysis and Recognition	ICDAR 2013	Tunisia
	SEP ICIAP 2015 : 18th International Conference on Image Analysis and Processing	ICIAP 2013	Italy
	SEP * ICIP 2015 : IEE International Conference on Image Processing *		Canada
	NOV 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

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