

IAPR

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Newsletter

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From the Editor's Desk: How can I help you?

by Arjan Kuijper

arjan.kuijper@igd.fraunhofer.de

<http://www.gris.tu-darmstadt.de/~akuijper/>

"How can I help you?" How do you typically respond to this question? My first reaction is, "No, thank you," perhaps with an additional, "I'm just looking around." This may be the typical introvert reaction that many scientists have, and this "I can do it myself" attitude may be the reason that many are labelled "nerd".

Having already admitted to declining help in most situations, I am now about to ask you—the readers of the *IAPR Newsletter*—to help *me* help you. Will you behave nerdishly? I hope not!

The IAPR communicates through its scientific journals and also through this newsletter and the IAPR website (www.iapr.org). I need your help with the non-scientific media.

What kind of information would you like to see?

What value does the IAPR provide to you (besides some conference fee discounts)?

Besides conference information, is there anything else you would like to see from the IAPR?

Does it make sense for the IAPR to

be active on social media (if so, on which)?

If you have some thoughts, I want to read them, arjan.kuijper@igd.fraunhofer.de

In the meanwhile, I'd like to bring the [IAPR Research Scholarship](#) program to your attention. In this issue, you'll find an interview with Moises Diaz, the first IAPR Research Scholar, who spent some time of his PhD studies abroad, partially funded by the IAPR. It's a way of "Checking out what other people are eating" ([IAPR Newsletter 38\(4\) 2016](#)).

To me, this is a typical example of the additive value the IAPR has. Living in a global, digital, connected village still requires a personal touch, and a stay abroad can give your PhD time something extra. You just have to know that such programs exist—and you need to take a step and use the help offered.

And so, I repeat the question, "How can we help you?"

Arjan

p.s. I am not the first EiC to ask this question. See [IAPR Then and Now](#) on page 2 of this issue.

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/

[ICPRAM 2018](#)

The 7th International Conference on
Pattern Recognition Application and Methods
Madeira, Portugal
Deadline: Jul. 31, 2017
Dates: Jan. 16-18, 2018

[GREC 2017](#)

12th International Workshop on Graphics Recognition
Kyoto, Japan
Deadline: Aug. 1, 2017
Dates: Nov. 9-10, 2017

[HIP'2017](#)

4th International Workshop on
Historical Document Imaging and Processing
Kyoto, Japan
Deadline: Sep. 1, 2017
Dates: Nov. 10-11, 2017

[MedPRAI 2018](#)

The Second Mediterranean Conference on
Pattern Recognition and Artificial Intelligence
Rabat, Morocco
Deadline: Sep. 2, 2017
Dates: Mar. 27-28, 2018

[ICB 2018](#)

The 11th International Conference on
Biometrics
Gold Coast, Queensland, Australia
Deadline: Sep. 15, 2017
Dates: Feb. 20-23, 2018

[DAS 2018](#)

13th IAPR International Workshop on
Document Analysis Systems
Vienna, Austria
Deadline: Nov. 20, 2017
Dates: Apr. 24-27, 2018

[ICPR 2018](#)

The 24th International Conference on Pattern Recognition
Beijing, China
Deadline for Proposals for Workshops, Tutorials and Contests: Dec. 15, 2017
Deadline: Jan. 5, 2018
Dates: Aug. 20-23, 2018

IAPR Then and Now...30 Years Ago

FROM THE EDITOR'S DESK , IAPR Newsletter Vol. 10 No. 1, March 1987

One of the problems which has always haunted the Editor of the IAPR Newsletter is the scarcity of material submitted for publication. While the first reaction might be to postpone the production of next issue until the available pages are filled with print, this necessarily introduces an element of randomness in the publication schedule which can only discourage the inflow of topical material in the future. I intend to overcome this chicken and egg situation by introducing a rigid production schedule , with the Newsletter appearing in March, June, September and December come what may. So if you receive a blank copy then at least you will know that the Editor is not to be blamed (at least not entirely).

On a more constructive note, I would like to see the Newsletter become a forum for the ordinary IAPR member to express his or her views, pleasure or displeasure concerning any aspect of IAPR activities or any matter affecting the IAPR community. Are you satisfied with the format of IAPR conferences? What type of activities should IAPR engage in? How can the Newsletter be improved? Your contributions should be received well before the published deadlines for news copy to have a reasonable chance of appearing in the next issue.

The Editor [Josef Kittler]

Calls from IAPR Committees

From the IAPR Executive Committee (ExCo):

Call for Proposals for "Summer" Schools

Deadline: October 1, 2017
(for schools planned for
December 2017 - March 2018)

"Summer" schools are training activities where participants are exposed to the latest trends and techniques in the particular pattern recognition field. They provide a unique opportunity to engage students and junior researchers with senior scientists in a fruitful way.

To be eligible for a grant, the organizers must work through at least one of the IAPR's technical committees as they develop and present the proposal.

Of course, the term "Summer School" is somewhat generic and traditional. There is no requirement that a school be offered during the summer.

How to Submit: Proposals for IAPR funded summer schools should be submitted to IAPR Treasurer Apostolos Antonacopoulos by email (a.antonacopoulos@primaresearch.org). A PDF attachment containing all the required information is appreciated.

For detailed guidelines on the proposal, see the [ExCo Initiative on Summer Schools](#).

From IAPR TC4 on Biometrics Call for Nominations 2017 IAPR Young Biometrics Investigator Award (YBIA)

Deadline: August 15, 2017

The recipient is expected to be a young scientist, under the age of 40 as of 1st April 2017, who has made substantial contributions to the IAPR Biometrics community and whose research work has had a major impact in biometrics. The recipient of the 2017 award will deliver a plenary talk in IJCB 2017 (<http://www.ijcb2017.org/ijcb2017/index.php>).

More information can be found here: http://www.iapr.org/fellowsandawards/awards_ybiometrics.php.

From the IAPR Education Committee:

Call for Applications IAPR Research Scholarships

<http://www.iapr.org/docs/IAPR-EC-RS-Call-2016.pdf>

Description: IAPR Research Scholarships, awarded by the IAPR through its Education Committee (IAPR-EC), seek to make possible mobility across institutions and international boundaries for Early Career Researchers working in fields within the scope of the IAPR's interests. Through this program, the IAPR sees an opportunity to make a significant contribution to the development of Early Career Researchers as well as the wider Pattern Recognition community.

Covered expenses, funding and duration:

- The scholarship will cover round trip travel and basic living expenses
- The visits will be no longer than 12 months in duration.

Requirements:

- The candidate must be a full-time researcher (PhD research student who has completed at least one year's study at this level or someone already employed as a full-time researcher who has been active in the field for fewer than eight years and is working at a level equivalent to a post-doctoral researcher.
- The candidate must be member of an IAPR member society.
- The covered travel and housing expenses cannot be funded by another scholarship. If there is a shortfall between the actual costs and the amount covered by the Scholarship, the candidate may seek complementary funding, usually from either the home or the host institution.
- The host institution must be different from the candidate's home institution and should be in a different country.
- The home and host institutions must give explicit approval by a signed letter.
- A successful applicant will be permitted to adopt the title "IAPR International Scholar" for the period of the award.

Click here for the full Call for Applications.

Contact information:

IAPR-EC Chair
c/o Josep Lladós
josep.llados@cvc.uab.es

IAPR Secretariat
c/o Linda O'Gorman
secretariat@iapr.org

Getting to know...John Daugman, IAPR Fellow

Biometric Entropy: Searching for Doppelgängers (ICB 2016 IAPR Senior Biometrics Investigator Award Lecture)



Editor's note:

John Daugman is the recipient of the 2016 IAPR Senior Biometrics Investigator Award (SBIA) at ICB 2016 (see [report](#)). For this feature article, we asked Prof. Daugman to explain his award lecture for a general audience. A detailed discussion on the topic can be found in "[Searching for doppelgängers: assessing the universality of the IrisCode imposters distribution](#)" by John Daugman and Cathryn Downing and published in IET Biometrics.

The SBIA is presented at ICB in alternate years with the Young Biometrics Investigator Award (YBIA). Please see the [Call for Nominations for the 2017 YBIA](#).

~ Arjan Kuijper, Editor-in-Chief

by [John Daugman](#), Professor of Computer Vision and Pattern Recognition, University of Cambridge

The science of pattern recognition has deep roots in ancient philosophical concepts of the universal and the particular. In order to classify a thing as belonging to a class of objects, such as faces or bicycles, one must learn and detect the generic properties that should be universally possessed by members of such classes. But in order to discriminate among members of any such class and detect a particular one (Anna's face; my bicycle), one must learn and detect the features specifically unique to such instances. These two fundamental notions relate broadly to Plato's concept of "ideal forms" (of which any particular instance is just a transient projection), and to Aristotle's concept that the essence of a particular thing is "that which makes it different from everything else".

The tasks of face recognition begin, of course, with detecting faces generically (e.g. the Viola-Jones algorithm), then identifying a particular

*John Gustav Daugman,
IAPR Fellow*

ICPR 2012, Tsukuba Science City

*For contributions to computer
vision, pattern recognition and
biometrics*

John Daugman received his degrees at Harvard University and then taught at Harvard before coming to Cambridge University, where he is Professor of Computer Vision and Pattern Recognition. He has held the Johann Bernoulli Chair of Mathematics and Informatics at the University of Groningen, and the Toshiba Endowed Chair at the Tokyo Institute of Technology.

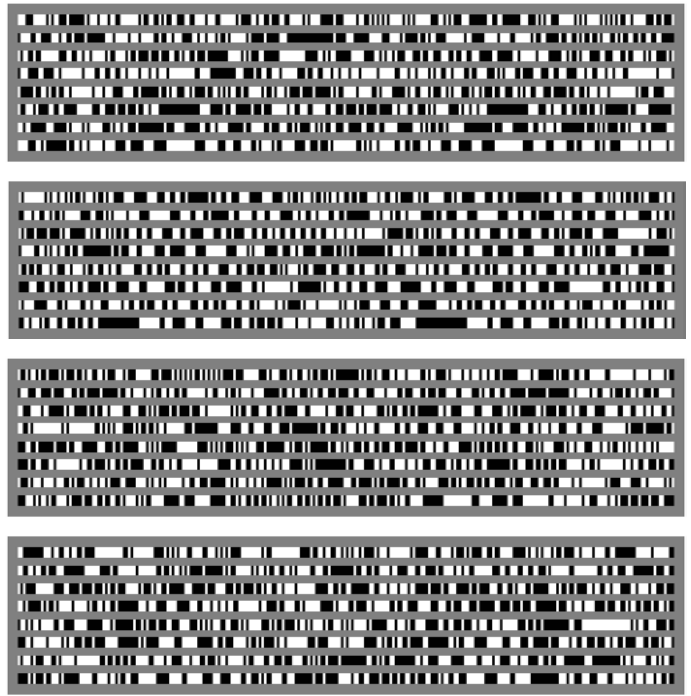
His areas of research and teaching at Cambridge include computer vision, information theory, neural computing and statistical pattern recognition.

Awards for his work in science and technology include the Information Technology Award and Medal of the British Computer Society, the "Time 100" Innovators Award, and the OBE, Order of the British Empire. He has been elected to Fellowships of: the Royal Academy of Engineering; the Institute of Mathematics and its Applications; the International Association for Pattern Recognition; the British Computer Society; and the US National Academy of Inventors. He received the 2016 Senior Biometrics Investigator Award from the IAPR. He was one of three finalists for the European Inventor of the Year Award, and recently he has been inducted into the US National Inventors Hall of Fame.

face (e.g. with Google FaceNet), perhaps with invariance across facial expressions; or perhaps the converse task of detecting and classifying facial expressions with invariance to person identity. Face identification is plagued by the “Doppelgänger problem”: there is not sufficient entropy (or statistical variation) among different faces to support large-scale database searches without drowning in false matches. Gold standard verification performance targets a false match rate (FMR) of one in 1,000 (depending on database difficulty). But in analogy with the “birthday problem”, (namely, that once 23 or more persons are randomly assembled it becomes more likely than not that at least one pair of them share a birthday), we have a collision problem here. At the benchmark FMR = 0.001 for single comparisons between different faces, then once a facial database is only as large as 38 persons, it becomes more likely than not that at least one pair of them would be falsely matched to each other (since 0.999 raised to the power $38 \times 37 / 2$, the number of possible pairings, is less than one-half). Facial Doppelgängers abound.

Information Theory teaches that avoiding accidental collisions (false matches) in database searches depends on using features with sufficiently high entropy (random variation) to ensure uniqueness. This is for exactly the same reason that cryptographic keys with higher entropy are stronger. Many years ago, I invented automatic iris recognition, identifying persons by the random patterns visible in the iris of an eye from some distance. My algorithms remain the basis of all public deployments of this technology worldwide, and the Government of India has now nearly finished enrolling all 1.2 billion citizens’ iris patterns (together with fingerprints) in a national ID and welfare entitlements distribution system. The principle behind these algorithms is that you are recognised because you failed a test of statistical independence against a template enrolled previously for yourself. This is an extremely powerful basis for pattern recognition, when there is sufficiently high entropy across different templates that the probability of chance collisions among different templates is minuscule. Each new enrollee in the Indian scheme is compared against all existing enrollees, for de-duplication checks. The portrayals here of actual IrisCodes (bit sequences that encode the phase structure of iris patterns) illustrate by their obvious entropy why false matches are avoided, despite such vast numbers of opportunities to make false matches. This is why there are no iris Doppelgängers.

Since the phase bits are equally likely to be 1 or 0, and thus any given bit from two different eyes’



IrisCodes are equally likely to agree or disagree, the distribution of such similarity scores (Hamming distances) whenever different eyes are compared is almost universal and invariant. It is remarkably narrow, and it corresponds to the distribution you would get from tossing a fair coin about 250 times in a row and tallying up the fraction of “heads” obtained: it is exceptionally rare to deviate much from a 50/50 fraction. We performed 100 billion comparisons between IrisCodes from different eye pairings, generating 316,250 different distributions (each for one eye against all of the others). Their standard deviations rarely differed by more than 2 percent. Thus, we have here the exceptional situation in pattern recognition that whenever different things are compared, their similarity scores are always drawn from the same, narrow, universal distribution! This is one reason why large biometric entropy is the key to avoiding false matches in huge, national-scale identifications.

The bit-sequence encoding also lends itself to extremely fast search, because IrisCode matching only requires a bit-parallel Exclusive-OR, on as many bits at once as the word-length of the machine. This allows millions of IrisCodes to be compared per second per single-core CPU. Prior image processing steps (segmentation of the visible iris at its boundaries, detecting occlusions, and normalising the iris texture into a dimensionless, pseudo-polar mapping) are executed as fast as the video frame-rate. The actual encoding of the bit stream resembles what is now called a convolutional neural network; but some readers of this newsletter may rejoice that it has nothing to do with “Deep Learning”!

An interview with Moises Diaz, recipient of the first IAPR Research Scholarship



Editor's note:

This interview gives insight into the IAPR Education Committee as well as an IAPR...Next Generation researcher as well as the [IAPR Research Scholarship Program](#) itself. Three features in one!

A full paper based on the research conducted will be presented at ICDAR 2017.

~ Arjan Kuijper, IAPR Newsletter EiC

Moises Diaz received the M.Tech., M.Sc., and Ph.D. degrees in engineering, and the M.Ed. degree in secondary education from La Universidad de Las Palmas de Gran Canaria, Las Palmas, Spain, in 2010, 2011, 2016, and 2013, respectively.

He is currently an assistant professor at Universidad del Atlantico Medio, Spain.

He has been a Post-Doctoral visiting researcher with the University of Hertfordshire, UK in 2017. He has also carried out research internships with the University of Salerno, Italy, the University of Bari, Italy, the University of Parma, Italy, the University of Fribourg, Switzerland, Indian Statistical Institute, Kolkata, India, and the École Polytechnique de Montréal, Montreal, QC, Canada.

His current research interests include pattern recognition, document analysis, handwriting recognition, biometrics, computer vision, and intelligent transportation systems.

Diaz serves as a reviewer for the Elsevier PRL, Elsevier CVIU, IEEE T-HMS, IEEE T-ITS and Plos One, as well as for International Conferences, including ICFHR, ICB, ICDAR and ITSC.

He is an IEEE and IAPR member.

EiC: How did you learn about the IAPR Research Scholar program?

MD: It was actually by chance. It was within the IAPR International Conference on Document Analysis and Recognition (ICDAR2015) in Nancy, France. I was in a coffee break when I decided to have a look at the flyers and announcements. At that moment, I saw Prof. Josep Lladós taking out of his bag the announcement of the IAPR Research Scholar program. So, I had the opportunity to speak with him and learn about this program.

EiC: How did you proceed to apply? Was the process complicated? How long did the process take (between deciding to apply, getting the application written, getting selected, going there ...)?

MD: I had decided to carry out a final visiting student research before finishing my PhD, so this program fit like a glove. After the conference in Nancy (2015), I discussed several options to do such a visit with my supervisor (Prof. Miguel A. Ferrer). We eventually decided that Salerno would be a promising option. So I prepared the paperwork and documents. In my opinion, the required documents were reasonable: research plan, letters from the host institution and so on. Once I gathered the documents, I sent an email to Prof. Josep Lladós and Linda O'Gorman. It was on February 23, 2016.

Then, my application was evaluated. They wrote to me a communication on July 11, 2016.

When my research visit finished, I sent an email to the IAPR board members with some required documents (flight boarding pass, a brief report with the activities developed in Salerno, and a letter from Prof. Marcelli). It was on October 7, 2016, and they reimbursed the agreed budget on December 2, 2016.

EiC: Did you and Prof. Marcelli know each other before? How did you meet?

MD: I officially started my PhD in 2013. At the beginning, I read some related papers. One of the most clear papers that I read was published by Prof. Marcelli and his team. This paper described the principles of the motor equivalence theory. I used this theory as one of the bases of my PhD.

I knew Prof. Marcelli in person from a conference (ICFHR 2014) in Crete, Greece. Then, I learned more about his research interest while we had some beers after the AFHA workshop, in Nancy 2015.

Also, my team, Grupo de Procesado Digital de la Señal (GPDS), in Spain had had some relations with the Prof. Marcelli's team.

EiC: What did the research scholarship cover?

MD: In my particular case, the scholarship covered the flights from my place to the University of Salerno (and return) and a certain weekly budget.

EiC: Did you achieve any scientific results that you would not have achieved otherwise?

MD: Definitely yes. I would like to highlight the discussions with Prof. Marcelli and his lab staff. They were really interesting and I could learn more about their spin off, their research, their forensic relationships, etc. It helped to me to write a scientific paper for ICDAR 2017 (which will be presented at the conference). In this paper we show the initial results of our collaborative research. Additionally, we also presented a paper in the IGS 2017 conference. It could be said that it was a scientific-wise fruitful collaboration.

EiC: Did your stay have an impact on further collaborations?

MD: Personally, it is a bit too early to properly answer this question. However, some work that I had previously developed was useful for this stay. For instance, the paper published in the IGS 2017 conference was a follow up of previous research work between Prof. Marcelli's team and my PhD research, but explored completely new directions, on which none of us had previously investigated.

EiC: Were there any outcomes (scientific, collaboration, other) that were not anticipated?


MD: After my stay the relationship between my group in Spain and Prof. Marcelli's group has been strengthened, and we will likely end up in a joint project that will be submitted for funding.

EiC: In addition, please share any recommendations you may have to improve the IAPR Research Scholarship program.

MD: In my opinion, this is an excellent program for students. The publicity of this program is essential. Apart from IAPR publicity, perhaps it could also be publicised by the IAPR's national member societies. I think the national associations can easily find in their countries good candidates to apply to this rewarding program.



Presentation of the IAPR Research Scholar Certificate at ICPR 2016. From left, Josep Lladós (Chair, IAPR-EC, 2014-2016) Moises Diaz, Ingela Nyström (IAPR President, 2014-2016).



International Association for Pattern Recognition

IAPR Research Scholar

to

Your name here

for research entitled

Your research

conducted [at some time in the future],
at [a host university] under the supervision of [a hosting professor]

IAPR Education Committee Chair IAPR President

Learn more about the IAPR Research Scholarship Program here:
<http://www.iapr.org/docs/IAPR-EC-RS-Call-2016.pdf>

BENCHMARK DATASETS

Editor's note:

For the "Benchmarking Datasets" feature in this issue, the IAPR Newsletter spotlights benchmark challenges at ICCV'17 that have come to our attention. IAPR TC12 and ChaLearn Looking at People have two challenges (see [TC12](#) article in the TC News section of this issue for more information), and we also learned about one from IBUG.

Do you have benchmarking news to share?

Send the link.

Describe the contents.

Include a contact person.

We'll feature your dataset in this series.

~ Arjan Kuijper, IAPR Newsletter EiC
arjan.kuijper@igd.fraunhofer.de



IAPR TC12 and ChaLearn Looking at People have two challenges related to human behavior analysis at ICCV'17. The [ChaLearn Competition on Action, Gesture, and Emotion Recognition: Large Scale Multimodal Gesture Recognition and Real versus Fake Expressed Emotions](#).



Call For Participation:

1st 3D facial tracking in-the-wild challenge in conjunction with ICCV 2017 <http://bit.ly/2szZTCb>
Contact: menpo.3d.challenge@gmail.com

Currently comprehensive benchmarks exist for facial landmark localisation and tracking (e.g. [300W](#), [300VW](#), [Menpo Benchmark](#)). In ICCV'17 we make a step further and introduce a new benchmark that includes both 2D and 3D tracking of landmarks in videos. This will likely be considered as the standard benchmark for the following years in landmark localisation in 3D tracking, hence we invite you to demonstrate the strengths of your research projects.

All researchers with interest in the subject are encouraged to participate.

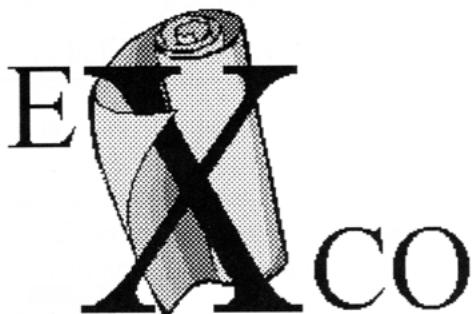
IMPORTANT DATES:

17 June: Release of training data.
30 July: Release of test videos.
9 August: Deadline for returning the results.
16 August: Deadline for paper submissions.
25 August: Submission of the camera ready.

You can also subscribe in the form for future announcements about new [Menpo] competitions here:
<https://goo.gl/forms/Xfp0hHH5oXJAbN2S2>

From the

News from the Executive Committee of the IAPR



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



Victoria, July 19, 2017

The IAPR ExCo is currently preparing for its interim meeting, which is traditionally held in years between ICPR conferences in the home city of the IAPR Past President. This year, the meeting will be hosted by Prof. Ingela Nyström at the University of Uppsala, Sweden, on August 28 and 29, 2017. Although we will have a very dense agenda on both days, I am grateful for the opportunity to visit again this charming Swedish city which is, according to Lonely Planet, the ‘historical and spiritual heart of the country.’



Uppsala Cathedral at midnight

Since the last ExCo meeting in Cancun, December 2016, progress has been made on many fronts. Most IAPR [Standing Committees](#) have been finalized and have started their mandated work. Please consult the IAPR web page for the most up to date information on the composition of Standing and [Technical Committees](#), TCs.



During the last three months, the ExCo has worked closely with the [ICPR 2018 Local Chairs and Workshop Co-chairs](#), as well as with the IAPR Conferences and Meetings Committee (C&M), in order to improve the organization and possibly increase the quality and the visibility of satellite workshops at ICPR 2018. The results of this work are the following changes:



- The overall procedure for handling workshop applications has been streamlined. In particular, there will be a single online form for submitting an application to organize an ICPR 2018 Workshop and request IAPR endorsement/sponsorship.
- The workshop proposal form will enable a thorough evaluation process which will select only high quality workshops that are relevant in scope to ICPR.
- For the first time, for IAPR Endorsed/IAPR Sponsored ICPR 2018 Workshops, if requested by the workshop organizers, all accepted papers will be published in the “ICPR 2018 Workshops Proceedings” published like the ICPR Proceedings, but in a distinct volume to differentiate workshop papers from the main conference papers.
- As for ICPR 2016, the registration fee for the main conference will also include attendance at satellite workshops and tutorials. In this way the workshop organizers will be able to focus only on scientific matters without the burden of logistic and financial issues.



These are great steps towards ensuring that ICPR Workshop papers get the visibility that they deserve in international research communities. Some of the most innovative ideas and application areas come sometimes from satellite workshops, and the ICPR 2018 Workshops will provide highly focused forums where participants will have the opportunity to discuss specific topics in a collegial atmosphere that fosters collaboration.

The Call for Workshops for ICPR 2018 is going to be issued in the coming days. If you are interested in submitting a workshop proposal, I suggest that you follow the updates closely at the ICPR 2018 web page (<http://www.icpr2018.org/>).

I hope that you will enjoy reading the July issue of our newsletter!



IAPR MEMBER NEWS

Editor's note:

On behalf of the IAPR Community, the IAPR Newsletter sends warm congratulations to Herb Freeman as he celebrates the 70th anniversary of his graduation from Union College in Schenectady, NY, his "70th Re-Union".

Herb is a founding member of the IAPR, arranging for its incorporation, serving as its first treasurer, being awarded IAPR Fellowship and the K.S. Fu Prize in 1994, devoting over five decades of service to the organization, and, lastly, volunteering to update the IAPR's official history document <http://www.iapr.org/docs/IAPR-History.pdf> in 2008.

You can learn more about Herb and his fascinating life and career here: http://ethw.org/Oral-History:Herbert_Freeman.

*~ Arjan Kuijper, IAPR Newsletter EiC
arjan.kuijper@igd.fraunhofer.de*



IAPR Technical Committee News

This section of the IAPR Newsletter will publish short, timely items by and about the IAPR's Technical Committees.

There are three main aims:

1. to give the IAPR's TCs regular access to the broader IAPR community
2. to introduce the various TCs to those who are new to the IAPR and
3. to keep the rest of the IAPR community interested and informed about TC happenings.

~Arjan Kuijper, IAPR Newsletter EiC

IAPR TC1 - Statistical Pattern Recognition Techniques

<http://pralab.diee.unica.it/iapr-tc1/>

Battista Biggio, University of Cagliari, Italy, Chair
Luis Muñoz-González, Imperial College London, Vice Chair

IAPR TC1 on Statistical Pattern Recognition Techniques aims to promote interaction and collaboration among researchers working in statistical pattern recognition and machine learning, with applications in computer vision, cybersecurity and other related fields.

We have updated our new website at <http://pralab.diee.unica.it/iapr-tc1/>, from which it is now possible to subscribe to our mailing list and be constantly updated about the activities of TC1.

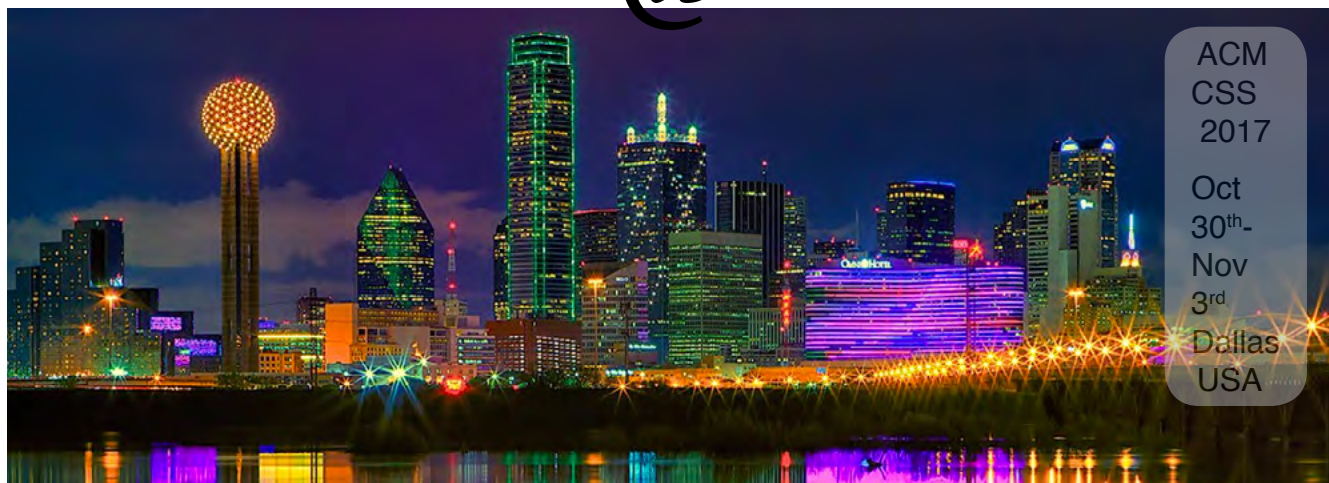
In this respect, we have been involved in the organization of the AISec workshop (<http://www.ai-sec.net/>), which provides a venue for presenting and discussing new developments in the intersection of security and privacy with artificial intelligence and machine learning. AISec is co-located with the flagship [ACM Conference on Computer and Communications Security \(CCS\)](#), and it will be held in Dallas, Texas, USA, on November 3, 2017. The deadline for paper submission is July 31, 2017, <http://ai-sec.net/AISec2017/call-for-papers.html>. Please do not hesitate to contact us if you are interested in participating or submitting a paper.

Moreover, we are also planning the organization of a summer school on such topics in 2018, as a follow up of the well established BTIA school (<https://comsec.diee.unica.it/summer-school/>), and we are actively involved in the organization of the next edition of S+SSPR, to be held in China in 2018.

If you are working in this exciting domain area, and want to be kept up-to-date or maybe contribute to TC1's activities please mail to battista.biggio@diee.unica.it.

AISec 2017

@



More IAPR Technical Committee News

IAPR TC11 - Reading Systems

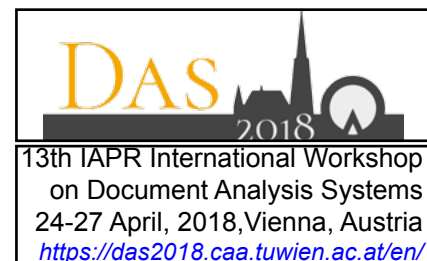
<http://www.iapr-tc11.org/>

[Dimosthenis Karatzas](#), Chair
[Masakazu Iwamura](#), Vice Chair

[IAPR TC11](#) (Reading Systems) is concerned with systems and methods for recognizing character content and structure in handwritten and typeset documents, images, and video. Recently our community has been busy with preparations for the International Conference on Document Analysis and Recognition (ICDAR) being held November 9-15 in Kyoto, Japan. Information regarding registration, hotel reservations, and student travel awards are now available from the [ICDAR 2017](#) website (<http://u-pat.org/ICDAR2017>).

ICDAR 2017 received 400 paper submissions, of which 214 were accepted (acceptance rate: 54%). 25 competitions have been held on a wide variety of tasks, and there will be eight workshops and three tutorials at the conference. In addition, there will be a special workshop concerned with exploring future directions for Document Analysis and Recognition research, which will be free of charge for participants—we hope to see you there.

Moving forward, please consider submitting your work on document recognition and analysis to [DAS 2018](#), [ICPRAI 2018](#), and [ICFHR 2018](#). Calls for papers are available from the links provided below. Also, the International Journal on Document Analysis and Recognition is planning a special issue on "Deep Learning for Document Analysis and Recognition." The deadline for submissions is August 31st, 2017.



And More IAPR Technical Committee News

IAPR TC12 Multimedia and Visual Information Systems

<http://iapr-tc12.info>

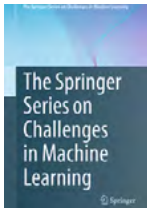
Sergio Escalera, Chair

Henning Müller and **Martha Larson**, Vice Chairs

A main activity of IAPR [TC12](#): Multimedia and Visual Information Systems is the design and implementation of benchmarking initiatives for multimedia analysis and retrieval. These initiatives are performed in collaboration with ChaLearn Looking at People, ImageCLEF, and MediaEval.



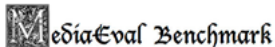
[ChaLearn Looking at People](#) and IAPR TC12 present the Explainable Computer Vision and Job Candidate Screening competition at CVPR 2017 workshops, 26th July 2017. A large multimedia dataset of "youtubers" is provided, including personality traits annotation, text transcriptions, audio, and video. The next workshop at the International Conference on Computer Vision, ICCV 2017, includes two associated challenges related to human behavior analysis: multi-modal human gesture recognition and human emotion recognition (fake vs real expressed emotions) from image sequences. <http://chalearnlap.cvc.uab.es/>



New Springer Series: The Springer Series on Challenges in Machine Learning (<http://www.springer.com/series/15602> and <http://ciml.cvc.uab.es/>). The books in this innovative series collect papers written by successful competitions in computer vision and machine learning. They also include analyses of the challenges, tutorial material, dataset descriptions, and pointers to data and software. Together with the websites of the challenge competitions, they offer a complete teaching toolkit and a valuable resource for engineers and scientists.



The ImageCLEF results for the four tasks of 2017 (lifelog, remote sensing, figure caption prediction and tuberculosis classification) are now online at <http://www.imageclef.org/> and the CLEF working notes will be ready by the end of July. Preparations for the CLEF workshop in September in Dublin are ongoing.



A report on the 2016 benchmark for Multimedia Evaluation ([MediaEval 2016](#)) has appeared in IEEE Multimedia magazine [1]. Currently, the [2017 edition of MediaEval](#) is running seven tasks, which use a variety of data sources: large-scale social images, satellite images, medical video, music. The task lists also include tasks that focus on interestingness, subjectivity, and emotion.

[1] M. Larson, M. Soleymani, G. Gravier, B. Ionescu and G. J. F. Jones, "The Benchmarking Initiative for Multimedia Evaluation: MediaEval 2016," in IEEE MultiMedia, vol. 24, no. 1, pp. 93-96, Jan.-Mar. 2017. <http://ieeexplore.ieee.org/document/7849098/>

Current and Upcoming Workshops:



ICPR 2018

24th INTERNATIONAL CONFERENCE ON PATTERN RECOGNITION

www.icpr2018.org

ICPR will be an international forum for discussions on recent advances in the fields of Pattern Recognition, Machine Learning, and Computer Vision and on applications of these technologies in various fields.

IMPORTANT DATES

Oct. 15, 2017 - Proposals for Workshops, Tutorials and Contests

Nov. 5, 2017 - Submission opens

Jan. 5, 2018 - Paper submission deadline

August 20-24, 2018 - Conference Dates

In Beijing, China — August 20-24, 2018

GENERAL CHAIRS:

Tieniu Tan (China), Josef Kittler (UK), Anil Jain (USA)

PROGRAM CHAIRS:

Cheng-Lin Liu (China), Rama Chellappa (USA), Matti Pietikäinen (Finland)

TRACKS and TRACK CHAIRS:

Track 1: Pattern Recognition and Machine Learning

Dacheng Tao (Univ. of Technology Sydney, Australia)
Daniel Lee (University of Pennsylvania, USA)
Marcello Pelillo (University of Venice, Italy)
Sergios Theodoridis (Univ. of Athens, Greece)

Track 2: Computer Vision

Hongbin Zha (Peking University, China)
Takayuki Okatani (Tohoku University, Japan)
Krystian Mikolajczyk (Imperial College, UK)
Ming-Hsuan Yang (UC Merced, USA)

Track 3: Speech, Image, Video and Multimedia

Changsheng Xu (Inst. of Automation of CAS, China)
Theo Gevers (Univ. of Amsterdam, The Netherlands)
Bhiksha Raj (Carnegie Mellon University, USA)
Yi Yang (University of Technology Sydney, Australia)

Track 4: Biometrics and Human Computer Interaction

Zhenan Sun (Institute of Automation of CAS, China)
Arun Ross (Michigan State University, USA)
Massimo Tistarelli (University of Sassari, Italy)
Brian Lovell (University of Queensland, Australia)

Track 5: Document Analysis and Recognition

Koichi Kise (Osaka Prefecture University, Japan)
Venu Govindaraju (SUNY Buffalo, USA)
Simone Marinai (University of Firenze, Italy)
Apostolos Antonacopoulos (University of Salford, UK)

Track 6: Biomedical Imaging and Bioinformatics

Tianzi Jiang (Institute of Automation of CAS, China)
Dimitris Metaxas (Rutgers University, USA)
Elena Marchiori (Radboud Univ., The Netherlands)
Seong-Whan Lee (Korea University, Korea)

WORKSHOPS, TUTORIALS & CONTESTS

<http://www.icpr2018.org/index.php?m=content&c=index&a=show&catid=29&id=22>

The ICPR 2018 Organizing Committee invites proposals for workshops, tutorials and contests in conjunction with the 24th International Conference on Pattern Recognition (www.icpr2018.org). These events will be held on August 19th, 2018, immediately before the main conference.

The ICPR 2018 workshops will provide an informal setting where participants will have opportunities to discuss technical topics in an atmosphere that fosters the active exchange of ideas. The topics of the workshops should be such that the workshops do not divert papers from the main conference. Each proposal will be assessed for its scientific content, proposed structure and overall relevance. Furthermore, Good workshops encourage discussion and interaction between the participants, which can be achieved in a number of ways, e.g., through presentations of submitted work, panel discussions and hands-on sessions.

Deadline and Submission Information:

Deadline for proposal submission: **December 15, 2017**
Proposals are submitted with one single online application form that is automatically delivered to the C&M chair and ICPR 2018 workshop chairs.

Workshop Co-chairs:

Prof. Zhaoxiang Zhang (CASIA, China)
zhaoxiang.zhang@ia.ac.cn
Prof. David Suter (Adelaide, Australia)
dsuter@cs.adelaide.edu.au
Prof. Yingli Tian (CUNY, USA)
ytian@ccny.cuny.edu



Meeting Reports

Conferences, Workshops & Summer Schools



General Chairs:

[Cheng-Lin Liu](#), China

Youbin Chen, China

by [Xu-Yao Zhang](#)

ICFHR 2016 was held at the Ming Wah International Convention Centre, Shenzhen, China. ICFHR is the most important event in the field of handwriting recognition. The aim of this conference is to bring together international experts from academia and industry to share their experiences and to promote research and development in all aspects of handwriting recognition and applications. ICFHR 2016 was sponsored by the International Association for Pattern Recognition (IAPR) [TC11 on Reading Systems](#), and was organized by the Institute of Automation of Chinese Academy of Sciences (CASIA) and the Shenzhen Graduate School of Tsinghua University. Over 150 participants attended the conference.

ICFHR 2016 was highlighted by three keynote talks. Prof. [Lambert Schomaker](#) of the University of Groningen, the Netherlands, gave a talk entitled "How Deep is Deep and What's Next in Computational Intelligence". Prof. [Hermann Ney](#) of RWTH Aachen University, Germany, gave a talk on "Handwriting and Speech Recognition: From Bayes Decision Rule to Deep Neural Networks". Prof. [Masaki Nakagawa](#) of Tokyo University of Agriculture and Technology, Japan, spoke about "Online Handwriting Recognition: Past, Present and Future". The keynote talks covered important topics including the emerging deep learning as well as the historical review of handwriting recognition techniques and applications. A panel session was also organized to discuss the frontier research

issues of handwriting recognition in the deep learning era.

The program included seven oral sessions, two poster sessions and a competition session. The 33 oral papers and 66 poster papers were selected from 135 full submissions after strict review. The topics covered handwritten document segmentation and understanding, deep learning for handwriting recognition, online handwriting recognition, handwritten character and text recognition, handwritten document retrieval, writer identification, and other related issues of document image analysis and applications. The eight competition papers reported the results of benchmarking on different techniques in handwriting recognition.

The conference also hosted



tutorials. The tutorial “Forensic Document Examination: State of the Art and Open Issues” was presented by Michael Blumenstein, Donato Impedovo, Imran Malik, and Angelo Marcelli. The tutorial “Deep Representation Learning for Handwriting Recognition” was presented by Tonghua Su and Guoqiang Zhong.

The social program of ICFHR 2016 was very impressive. The social event took place at the Chinese Folk Culture Village, where the conference delegates were surprised by a show of Chinese dances and acrobatics. The banquet was then held at

the GLEETOUR Seaview Hotel Shenzhen.

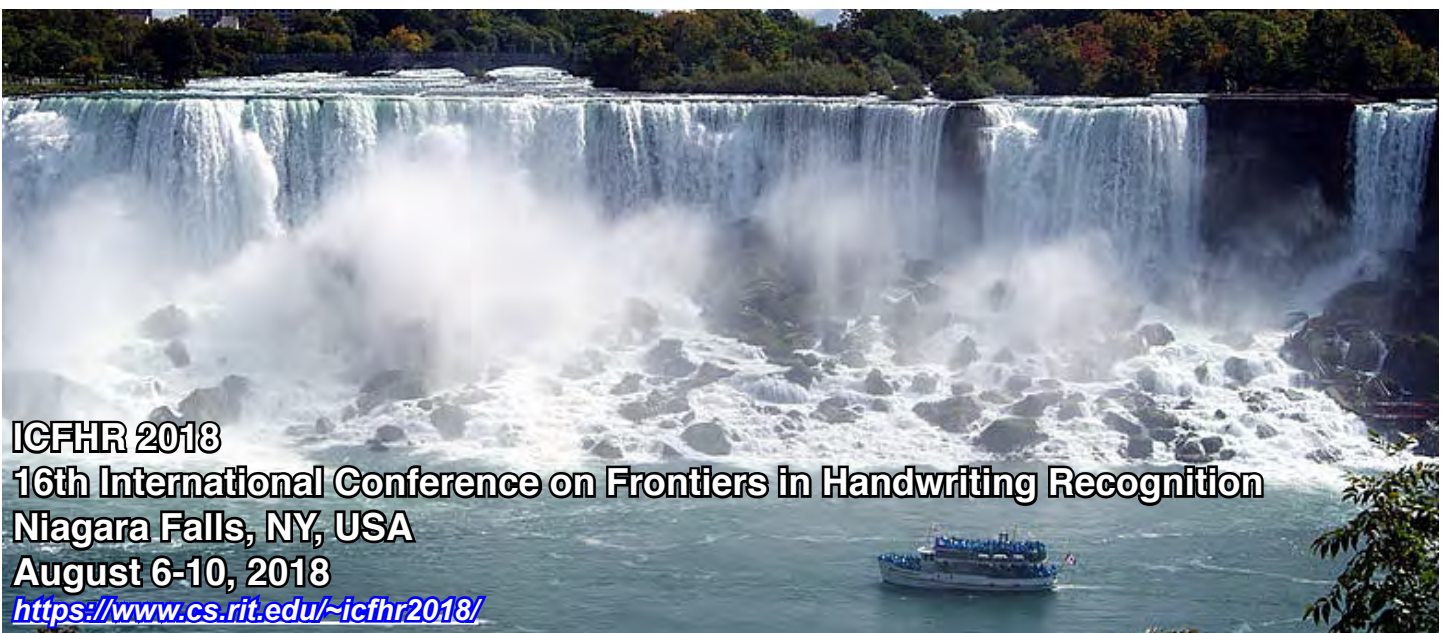
At the closing ceremony, three paper awards were announced and presented. The awards were selected based on evaluation of review scores and presentation quality by a committee led by the program chairs. The paper awards and the recipients are as follows:

- IAPR Best Paper Award: Sebastian Sudholt and Gernot Fink. "PHOCNet: A Deep Convolutional Neural Network for Word Spotting in Handwritten Documents"
- IAPR Best Student Paper

Award: Paul Voigtlaender, Patrick Doetsch and Hermann Ney. "Handwriting Recognition with Large Multidimensional Long Short-Term Memory Recurrent Neural Networks"

- IAPR Best Poster Award: Lei Hu and Richard Zanibbi. "MST-Based Parsing of Online Handwritten Mathematical Expressions"

Proceedings of ICFHR 2016
have been published in
[IEEE Xplore](http://ieeexplore.org)



ICFHR 2018
16th International Conference on Frontiers in Handwriting Recognition
Niagara Falls, NY, USA
August 6-10, 2018
<https://www.cs.rit.edu/~icfhr2018/>

CIARP 2016

XXI Iberoamerican Congress on Pattern Recognition

Pontificia Universidad Católica del Perú

8-11 November 2016, Lima, Peru

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

General Chairs:

[César A. Beltrán Castañón](#), Pontificia Universidad Católica del Perú, Perú

[Ingela Nyström](#), Uppsala University, Sweden

[Fazel Famili](#), University of Ottawa, Canada

by the General Chairs

CIARP 2016, endorsed by the IAPR, was the 21st in the CIARP series of annual international conferences devoted to disseminating novel advances and applications in deep learning, image processing and analysis, machine learning, biomedical imaging, 3D computer vision, objects and scene understanding, and others. The conference is a vehicle to stimulate the diffusion of research among the ibero-american pattern recognition community (Argentina, Brazil, Chile, Cuba, Mexico, Uruguay, Portugal, Spain, Peru, and Colombia). CIARP 2016 was held in Lima, the capital of Peru.

CIARP 2016 received 119 papers, by 311 authors from 30 countries (Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Cuba, Czech Republic, Denmark, Ecuador, France, Italy, Mexico, Netherlands, Norway, Peru, Poland, Portugal, Russia, South Africa, Spain, Sweden, Tunisia, USA, Ukraine, United Kingdom, Uruguay, and Venezuela). Each submission was reviewed by three highly qualified

reviewers, and 69 papers (31 for oral and 38 for poster presentation) were accepted. The Program Committee was composed of 149 members from 30 countries. All of the accepted papers had scientific quality above the overall mean rating.

The final program was organized in a single track with eight oral sessions in which general interest papers were presented. Additionally, there were two poster sessions with two minute highlight presentations during the program. Each session was in led by a renowned researcher: Bernardete Ribeiro (Portugal), Marcelo Mendoza (Chile), Gabriela Sanniti di Baja (Italy), Maria Trujillo (Colombia), Michal Haindl (Czech Republic), Ingela Nyström (Sweden), Oriol Pujol (Spain), Francesc Ferri (Spain), Jordi Vitrià (Spain), Alvaro Gómez (Uruguay), Pablo Negri (Argentina), Guillaume Noyel (France).

As a tradition of the conference, two awards were given:

- The IAPR-CIARP Best Paper Prize was given to Santi Seguí, Michal Drozdal, Guillem Pascual, Carolina Malagelada,

Fernando Azpiroz, Petia Radeva, and Jordi Vitrià for the paper “Deep Learning Features for Wireless Capsule Endoscopy Analysis”.

- The Iberoamerican CIARP Aurora Pons-Porrata Medal was given to Petia Radeva, from Spain. This award is given in recognition of technical contribution to the field of pattern recognition.

The selection of the winners was based on the evaluation and recommendations of the Program Committee members, for the IAPR-CIARP Best Paper Prize, and the proposal of the national associations on pattern recognition, for the Aurora Pons-Porrata Medal. These national proposals were evaluated by the Award Committee constituted by three previously awarded researchers: Marta Mejail (Argentina), María Luisa Micó Andrés (Spain), and Heydi Méndez-Vázquez (Cuba).

Besides the 69 accepted papers, the scientific program of CIARP 2016 also included four outstanding keynote speakers who offered talks with the cutting edge



advances in pattern recognition:

- Yann LeCun (Facebook AI Research, NY University): “Unsupervised Learning: the Next Frontier in AI”
- B.S. Manjunath (University of California): “BisQue: Scalable Scientific Image Informatics with Deep Learning in the Cloud”
- Xiaohui Liu (Brunel University London): “25 years of data analytics: what has been learnt?”
- George Azzopardi (University of Malta): “COSFIRE: A brain-inspired approach to visual pattern recognition”

During the evenings the participants enjoyed the different attractions of the city. Lima is a foodie paradise with world-class restaurants. Lima’s historic center is lively and easy to walk, where you can find monasteries, museums and historic places. One of the true wonders of the world, buried deep in the Andes Mountains of Peru, is Machu Picchu, symbol of Inca civilization.

CIARP 2016 organization in Peru was an excellent opportunity for the pattern recognition community, especially in the Latin American region, to share scientific experiences and promote theoretical and practical development in machine learning.

The Pontifical Catholic University of Peru showed its high degree of organization—which ratifies its national and continental leadership—by promoting the organization of world-class events. Many thanks to those who supported the event (President and Vice-presidents, Post-graduate Unit in Computer Science, Faculty of Sciences and Engineering, Department of Engineering, Computer Engineering unit).

A special recognition to Ingela Nyström, President of the IAPR during 2014-2016, who gave freely of her time from the beginning of the organization until the publication of this report. In addition, we recognize the full support from Springer, which has been publishing the proceedings of

CIARP yearly, dedicating a special number through LNCS. The CIARP 2016 proceedings were published in the LNCS 10125 - ISBN: 978-3-319-52276-0 - Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications; Book ID: 421093.



See you again at CIARP 2017 that will be held in Valparaiso, Chile:
<https://www.ciarp2017.org/>



IAPR Summer School on Document Analysis: Document Informatics

Dates: 23rd to 28th January 2017

Location: Jaipur, India

Endorsed by: TC10 & TC11

<http://cvit.iiit.ac.in/SSDA/>

General Chairs:

[Santanu Chaudhury](#), CEERI, India

[Venu Govindaraju](#), University of Buffalo, State University of New York, USA

[C. V. Jawahar](#), IIT Hyderabad, India

by the General Chairs

SSDA 2017 was the first IAPR Summer School with emphasis on core informatics aspects, such as representation and indexing of large document collections, content representation and manipulation, information and document retrieval, machine learning and analytics for large document repositories. The summer school was conducted with invited speaker presentations from academia and industry. Participants performed hands-on exercises, presented posters and got feedback about their posters from the program committee.

There were a total 80 participants with a healthy diversity of geography. The 11 students were from Japan (3), Germany (1), Spain (2), Switzerland (4), and USA (1). The participant group was also diverse in terms of being a good mix from academia and industry. Participants' experience level ranged from experienced working professionals from industry, experienced and also young teaching faculty from educational institutes, graduate students, as well as bachelor's students. Some young professionals from industry were interested to know the research problems in the field. The student researchers were interested in the latest research developments in the field of document informatics. The invited talks gave a research overview on various paradigms of information foraging from document collections. The emerging tools and techniques for comprehensive interpretation of content were discussed at tutorial level and accompanied with laboratory sessions.

A Day-by-Day overview

First day (23rd January)

Professor Purnendu Ghosh (Executive Director, Birla Institute of Scientific Research, Jaipur) was the invited guest for the inaugural program.

Complete list of lecturers and the presented lectures

Monday, Jan 23

- Prof. Pushpak Bhattacharya (IIT Patna) Cognitive Natural Language Processing.
- Dr. Ashok Popat (Google Inc.) Developing Multilingual OCR and handwriting recognition at Google.
- Lab Session: Swapnil Behle and Tushar Patnaik (CDAC India) Indian Language OCR systems.

Tuesday, Jan 24

- Prof. Gernot Fink (TU Dortmund University, Germany) Word Spotting: From Bag-of-Features to Deep Learning.
- Prof. B. B. Chaudhuri (ISI Kolkata, India) Detection and cleaning of strike-out texts in offline handwritten documents.
- Lab Session: Word Spotting by Prof. Gernot Fink and Sebastian Sudholt.

Wednesday, Jan 25

- Prof. Koichi Kise (Osaka Prefecture University, Japan) Reading behavior analysis for reading-life log and its fundamental technologies.
- Prof. Bhabatosh Chanda (ISI Kolkata, India) Document page layout analysis.
- Lab Session: Prof. Koichi Kise and Charles Lima Sanches.

Thursday, Jan 27

- Prof. Marcus Liwicki (German Research Center for Artificial Intelligence) Historical Document Analysis.
- Dr. Lipika Dey (TCS Innovation Labs, India) Analyzing text documents - separating the wheat from chaff.
- Lab Session: DIVAServices (Prof. Marcus Liwicki, Marcel Würsch) and Texcape (Nidhi Saraswat, TCS Innovation Labs).

Friday, Jan 28

- Dr. Utkarsh Porwal (eBay, USA) Language Model: Theory and Applications.
- Dr. Manik Verma (Microsoft Research, India) Extreme Classification for Tagging on Wikipedia, Query Ranking on Bing and Product Recommendation on Amazon.
- Lab Session: Language Modeling by Dr. Utkarsh Porwal.

After a participant introduction, the opening talk was delivered by Pushpak Bhattacharya (IIT Patna). His talk, entitled "Cognitive Natural Language Processing", dwelt on the use of eye tracking and cognition based features such as Machine Translation, Sentiment Analysis, Readability, and Sarcasm to augment the efficacy of ML based NLP manifolds.

The second talk was delivered by Ashok Papat (Google Inc.) on "Developing Multilingual OCR and handwriting recognition at Google" in which he shared his team's experiences in developing a multilingual OCR and handwriting recognition system at Google. A demonstration of a gamut of Indian Language OCR systems was also presented by Swapnil Behle and Tushar Patnaik (CDAC India)

The day ended with poster presentations from participants. Program committee members visited the posters and engaged in dialogue about them.

Second Day (24th January)

The third invited talk was delivered by Gernot Fink (TU Dortmund University, Germany) on "Word Spotting: From Bag-of-Features to Deep Learning" which introduced a range of machine learning methods to derive powerful models for representing queries and handwriting retrieval using state of the art deep-learning architectures.

The fourth invited talk was by B.B. Chaudhuri (ISI Kolkata, India) on "Detection and cleaning of strike-out texts in offline handwritten documents" in which he discussed techniques to detect various types of strikeout texts and discussed a range of open problems in the frontiers of handwriting research.

The rest of the day was devoted to the hands-on lab sessions on word spotting.

Third Day (25th January)

Koichi Kise (Osaka Prefecture University, Japan) was the fifth invited speaker who spoke about "Reading behavior analysis for reading-life log and its fundamental technologies" where several in-situ technologies that produced a "reading log" from everyday common reading were presented.

The sixth talk was by Bhabatosh Chanda (ISI Kolkata, India) on "Document Page Layout Analysis" in which he discussed several methods and algorithms to extract logical components from structured as well as complicated designer layouts.

The rest of the day was devoted to poster presentations from participants who got feedback from the program committee members.

Fourth day (26th January)

This was the Republic Day holiday throughout India. Participants and speakers took time off for a local Jaipur tour and an Agra tour (famous for Taj Mahal).

Fifth day (27th January)

The seventh talk was by Marcus Liwicki (German Research Center for Artificial Intelligence) on "Historical Document Analysis" in which he discussed various challenges in historical document analysis and gave an overview of typical processing algorithms and reported the recent trends towards interoperability.

The eighth talk was by Lipika Dey (TCS Innovation Labs, India) on "Analyzing text documents - separating the wheat from chaff" in which she discussed the challenges in text data analysis and explained several techniques to get meaningful insights from text documents. The afternoon session was busy with the Labs and demos of DIVAServices (Uni. Fribourg) and Texcape (Tata Consultancy Services).

The closing of the day was with the talk "Development of National Digital Library of India" by Nanda Gopal Chattopadhyaya (NDL Project, NME-ICT, MHRD Indian Institute of Technology, Kharagpur).

A special Planetarium show was arranged for all as a wind down of the day.

Sixth day (28th January)

The ninth talk was by Utkarsh Porwal (eBay, USA) on "Language Model: Theory and Applications" in which he gave a tutorial on language modeling and its applications to text processing.

The tenth talk was by Manik Verma (Microsoft Research, India) on "Extreme Classification for Tagging on Wikipedia, Query Ranking on Bing and Product Recommendation on Amazon" in which he discussed various aspects related to the design of such classifiers in the context of recommender systems. The afternoon session was a lab and demo on language model tools.

The school ended with a valedictory session in which Prof. A K Pujari, Vice Chancellor of the Central University of Rajasthan, was the chief guest. Certificates of attendance were distributed to the participants.

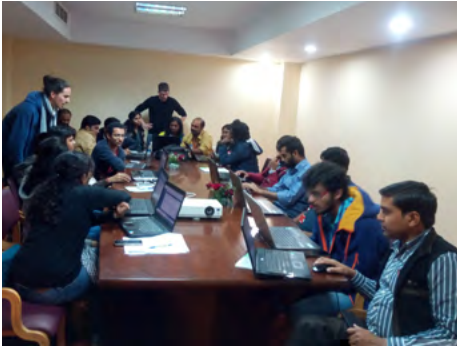
Features of the Program

All the talks were interactive in the spirit of a summer school and questions and explanations were encouraged. There were ample breaks in between so that the participants got the opportunity for technical discussions and networking.

About the Lab Sessions/Demo

The lab sessions were organized in three rooms each having a round table with about 25 chairs. All participants actively took part in the lab sessions. The participants were given a tutorial of the tools

and instructions on how to execute programs and what kind of results to expect for their inputs. Session instructors were there to answer individual doubts and queries.



About the Poster Sessions

The school participants were given the opportunity to submit an abstract and display a poster on their research activity. There were two poster sessions organized

in which a total 19 posters representing research from over 15 domestic and 4 international academic institutions were presented. The poster sessions, spread over two days, attracted lively scientific discussions and a few selected high quality posters will be published as full papers in the edited book volume to be brought out. Suggestions were given orally to some of the posters by committee members who visited the posters.

Banquet

The banquet was organized at Chokhi Dhani in Jaipur on the evening of the second day. The participants enjoyed the local cuisine, cultural shows and rural hospitality.

Sightseeing Tour

There were two sightseeing tours conducted on the fourth day of the school. One was an outstation tour to Agra and Fatehpur Sikri. The other was a local tour for sightseeing in Jaipur. A planetarium show was also organized for the participants in evening on the 5th day of the school.

Plan for the edited book

An edited volume on Document Informatics is being planned for the book series Advances in Computer Vision and Pattern Recognition (Springer) with contributed chapters from speakers and select participants in the school.





Computational Color Imaging

6th Computational Color Imaging Workshop (CCIW'17), March 29-31, 2017, Milan, Italy

<http://www.ivl.disco.unimib.it/minisites/cciw17/>

General Chairs:

[Simone Bianco](#), Italy

[Raimondo Schettini](#), Italy

[Shoji Tominaga](#), Chiba University, Japan

[Alain Trémeau](#), University Jean Monnet, St-Etienne, France

by the General Chairs

CCIW 2017 was the sixth CCIW and was organized by the University of Milan-Bicocca, with the endorsement of the International Association for Pattern Recognition (IAPR), the Gruppo Italiano Ricercatori in Pattern Recognition (GIRPR), and the Gruppo del Colore (GdC).

The aim of the workshop was to bring together engineers and scientists of various imaging companies and research laboratories from all over the world to discuss diverse aspects of their latest work, ranging from theoretical developments to practical applications in the field of color imaging as well as color image processing and analysis.

Since the first Computational Color Imaging Workshop organized in 2007 in Modena, Italy, CCIW has been an inspiration for researchers and practitioners in the fields of digital imaging, multimedia, visual communications, computer vision, and consumer electronics who are interested in the fundamentals of color image processing and its emerging applications. For CCIW 2017 there were many excellent

submissions of high scientific level.

Each paper was peer reviewed by at least two reviewers. Only the 20 best papers were selected for presentation at the workshop. The final decision for the paper selection was based on the criticisms and recommendations of the reviewers, and the content relevance of papers to the goals of the workshop. In addition to the submitted papers, three distinguished researchers were invited to this sixth CCIW to present keynote speeches. Challenging issues and open problems not sufficiently addressed in the state of the art were addressed at the workshop. In the following, we summarize issues and problems that were covered by the papers accepted for CCIW 2017, the invited speeches, and the tutorials.

CCIW 2017 started with four tutorials:

- Material Appearance by S. Tominaga
- Color Texture Analysis and Classification by F. Bianconi, C. Cusano, and P. Napoletano
- Review of Systems Coupling Multispectral Imaging and 3D Imaging by A. Trémeau

- Color Vision Is a Spatial Process: The Retinex Theory by M. Lecca

The three invited talks were hosted over the next two days:

- On Gloss and the Appearance of Color by A. Gijsenij
- Fourier Multispectral Imaging: Measuring Spectra, One Sinusoid at a Time by K. Hirakawa
- Computational Print Control by J. Morovic

In the Color Image Processing session, S. Yamaguchi et al. presented a method for smoke removal based on a smoke imaging model and a space-time pixel compensation. E. Provenzi presented the similarities and differences in the mathematical formalizations of the Retinex models and its variants. M. Lecca et al. presented a new Milano Retinex implementation, based on an intensity thresholding strategy.

In the Color Image Quality session, B. Ortiz-Jaramillo et al. presented a software for image fidelity assessment. S. Corchs and F. Gasparini presented a multidistortion database to be used for image quality assessment,

and G. Ciocca et al. presented an image analysis based on image complexity to investigate interference between distortions and image contents in image quality assessment.

In the Color in Digital Cultural Heritage session, J.A. Toque et al. presented a method for the visualization of subsurface features in oil paintings using a combination of high-resolution visible and near-infrared scanned images.

K. Yoshida et al. presented a scanner for high-resolution imaging of wall paintings. M. Tsuchida et al. presented a technique for visualizing lost design of degraded early modern tapestry using infrared images. R. Kanai et al. presented a novel scanning technique for imaging of gold and silver foils used in art works. T. Komiyama et al. presented a transmission type scanning system to be used for ultra high-resolution

scanning. And, T. Vitorino et al. showed the importance of hyperspectral imaging applied to the investigation of paintings.

In the Spectral Imaging session, P. Lapray et al. presented a database of spectral filter array images that combine both visible and near-infrared bands. H.A. Khan et al. presented an analytical survey of highlight detection in color and spectral images.

In the Color Characterization session, M. Hebert et al. presented a method for the characterization of structural color prints by hyperspectral imaging and hypercolor gamut estimation. S. Mazauric et al. presented a fast calibration reflectance-transmittance model to compute multiview recto-verso prints. J.-B. Thomas et al. presented the use of an image contrast measure as a gloss material descriptor.

In the Color Image Analysis session, S. Bianco et al. presented the recognition of artistic photo filtering using Convolutional Neural Networks. P. Napoletano presented a comparison between hand-crafted and learned descriptors for color texture classification. F. Bianconi et al. presented an improved opponent-color local binary patterns for color texture classification.

Proceedings have been published by Springer in Lecture Notes in Computer Science (LNCS, volume 10213). A journal special issue related to the workshop is also forthcoming as a Special Section in the Journal of Electronic Imaging (JEI) titled Computational Color Imaging.



The next CCIW will be held in Japan in 2019.

IAPR Then and Now...10 Years Ago, *IAPR Newsletter* Vol. 29 No. 4, October 2007

2007 Computational Color Imaging Workshop

The 2007 Computational Color Imaging Workshop (CCIW'07) was held in Modena, Italy, on September 14, 2007. The workshop, with the endorsement of the International Association on Pattern Recognition (IAPR), was organized along with the 14th International Conference on Image Analysis and Processing (ICIAP).

While planning the CCIW'07 workshop, its organizers/chairs, Raimondo Schettini (Univ. of Milano-Bicocca, Italy), Rastislav Lukac (Epson Canada Ltd., Canada) and Alain Tremeau (Univ. of Saint-Etienne, France), aimed at bringing together the international community of imaging scientist and technologists to discuss recent advances in the areas of color image processing and analysis, ranging from theoretical developments to practical applications. Twelve papers selected for presentation at the CCIW'07 workshop documented importance and challenges of computational color imaging and provided a good starting point for the valued discussion of the workshop

participants.

The workshop program included three sessions. After opening the workshop, the introductory session began with a discussion on color constancy (A. Gijsenij, Univ. of Amsterdam, Netherlands), followed by presentations on white chromaticity estimation (S. Bianco, Univ. of Milano-Bicocca, Italy) and color vision-based modeling (T. Jetsu, Univ. of Joensuu, Finland).

In the next session, the attention of workshop participants was brought to mathematical morphology for color images (O. Lezoray, Univ. of Saint-Lô, France), gamut expansion (M.R. Gupta, Univ. of Washington, USA), red eye removal (by L. Marchesotti, Xerox Research Center Europe, France), and color image sharpening and denoising (T. Horiuchi, Chiba University, Japan).

In the final session, the discussed themes included color bleeding removal from JPEG images (G. Spampinato, STMicroelectronics, Italy), animation

movie abstract construction (P. Lambert, Univ. of Savoie, France), compacigram-based color image segmentation (O. Losson, Univ. of Lille, France), resampling for the OSA-UCS color space (G. Menegaz, Univ. of Siena, Italy) and gamut preserving image dependent color sampling (A. Tremeau, Univ. of Saint-Etienne, France). The workshop ended with an open discussion moderated by the workshop chairs on the recent trends and future research directions in computational color imaging.

It is our hope that the workshop provided a convenient forum where researchers and practitioners in digital imaging, multimedia, visual communications, computer vision, and the consumer electronics industry, who are interested in the fundamentals of color image processing and its emerging applications, could interact and benefit from these interactions. We are looking forward to seeing you at future events devoted to computational color imaging.



MVA 2017
IAPR International Conference on
Machine Vision Applications
May 8-12, 2017
Nagoya, Japan

www.mva-org.jp/mva2017/

General Chairs:

[Hiroshi Ishikawa](#), Waseda University, Japan
Ryuzo Okada, Toshiba, Japan

Program Chairs:

[Norimichi Ukita](#), NAIST, Japan
[Greg Mori](#) Simon Fraser University, Canada

by the General Chairs

The Fifteenth IAPR International Conference on Machine Vision Applications (MVA 2017) was co-sponsored by the MVA Organization, the IAPR, and the Graduate School of Informatics, Nagoya University. The biennial MVA conference series, established in 1988, has aimed at bringing together researchers and practitioners from both academia and industry, covering the topics of sensing, algorithms, and applications in machine vision research. The venue of the 15th MVA was the Toyoda Auditorium at Nagoya University, Nagoya, Japan, where 234 participants gathered from 28 countries all over the world.

We received 194 full-paper submissions, from which 36 papers were selected for single-track oral presentation and 94 for poster presentation. An international program committee composed of 36 area chairs and 218 reviewers

made the selections using a rigorous double-blind peer-review process. The conference proceedings will be made available via IEEE Xplore, in addition to the MVA Organization website (<http://www.mva-org.jp/proceedings.php>), which also offers the proceedings of all of the past MVA conferences. This year, some of the best papers were also simultaneously published in the journal IPSJ Transactions on Computer Vision and Applications and are also freely accessible.

During the conference, three IAPR Distinguished Lectures on wide-ranging topics were given by three leading researchers: “Direct Methods for 3D Reconstruction & Visual SLAM” by Professor Daniel Cremers (Technical University of Munich), “Connecting the Dots: Embodied Visual Perception from First-person Cameras” by Professor Jianbo Shi (University of Pennsylvania), and “Image Recognition for Driver Assistance in Intelligent Vehicles” by

Professor Hiroshi Murase (Nagoya University). The financial support by the IAPR that enabled us to organize these valuable talks is greatly appreciated as well as the generous financial support from the Tateisi Science and Technology Foundation for other activities of MVA 2017.

MVA 2017 also offered several technical events. Technical demonstration sessions were intensified by the invitation of a number of internationally-renowned companies. Two events for promoting networking and friendship among young researchers in machine vision research were also arranged. A Young Researchers Meeting was held at the lunch time on May 9th, where junior researchers enjoyed discussing their work in a relaxed atmosphere with senior colleagues in the industry. We also arranged a Doctoral Thesis Session in collaboration with the IPSJ SIG-CVIM, a leading Japanese computer vision special interest



group.

After the main conference, two tutorial sessions were given by up-and-coming vision researchers: “Large-Scale Datasets and Scene Understanding” by Dr. Mohamed Omran (Max Planck Institute for Informatics) and “Machine Vision for Problems with Robot Manipulation” by Dr. Yukiyasu Domae (Mitsubishi Electric Corporation). Finally, a technical tour was conducted, in which the participants visited vision-related laboratories at Nagoya University and toured an actual Toyota manufacturing plant followed by the Toyota Kaikan Museum.

Following the MVA tradition, the following four awards were presented at the conference:

Most Influential Paper over the Decade Award (selected from the papers presented at MVA 2007)

- “One Fish, Two Fish, Butterfish, Trumpeter: Recognizing Fish in Underwater Video” by Andrew Rova, Greg Mori, and Lawrence M. Dill
- “A Video Motion Capture System for Interactive Games” by Ryuzo Okada, Nobuhiro

Kondoh, and Björn Stenger

Best Paper Award

- “Fast Search Based on Generalized Similarity Measure” by Yuzuko Utsumi, Tomoya Mizuno, Masakazu Iwamura, and Koichi Kise

Best Practical Paper Award

- “Mobile Hologram Verification with Deep Learning” by Daniel Soukup and Reinhold Huber-Mörk

Best Poster Award

- “Enhancing Discriminability of Randomized Time Warping for Motion Recognition” by Lincon Sales de Souza, Bernardo Bentes Gatto, and Kazuhiro Fukui
- Two Features Combination with Gated Recurrent Unit for Visual Speech Recognition” by Masaya Iwasaki, Michiko Kubokawa, and Takeshi Saitoh
- “A Deep Network Model based on Subspaces: A Novel Approach for Image Classification” by Bernardo Bentes Gatto, Lincon Sales de Souza, and Eulanda M. dos Santos

The Most Influential Paper over

the Decade Awards were given at the Banquet on May 9th, where participants enjoyed the beautiful night view of the Nagoya Castle. Prizes for papers presented at MVA 2017 were awarded at the closing session and warmly celebrated by the many attendees. We hope that the group photo, taken just after the closing session, conveys the friendly atmosphere during the conference.

The next MVA will be organized by a team lead by Ryuzo Okada (Toshiba) as a General Chair, and it will be held in Tokyo around the same time of the year in 2019.

Learn more about the MVA Organization
<http://www.mva-org.jp/about.php>

Proceedings of MVA 2017 will be published in [IEEEExplore](#) and at the MVA Organization website: <http://www.mva-org.jp/proceedings.php>



[GbR 2017](#)

11th IAPR TC-15 Workshop on Graph-based Representations in Pattern Recognition

May 16-18, 2017, Anacapri, Italy

<http://gbr2017.unisa.it/site/>

General Co-chairs:

[Pasquale Foggia](#), University of Salerno, Italy

[Cheng-Lin Liu](#), Institute of Automation of Chinese Academy of Sciences, China

[Mario Vento](#), University of Salerno, Italy

by Pasquale Foggia and Mario Vento

GbR is a IAPR-sponsored biennial workshop organized by the [IAPR Technical Committee 15 \(TC15\)](#), aimed at encouraging research works in Pattern Recognition and Image Analysis within the graph theory framework. This workshop series traditionally provides a forum for presenting and discussing research results and applications in the intersection of pattern recognition and image analysis on one side and graph theory on the other side.

The 11th edition of GbR was held in Anacapri, a village on the wonderful and world-renowned island of Capri, in Italy, and was organized by Professors Pasquale Foggia and Mario Vento of the University of Salerno, and Cheng-Lin Liu of the Institute of Automation of the Chinese Academy of Sciences.

The program included two invited talks by IAPR-sponsored speakers:

- **“Graph Edit Distance: Basics and History”** by Prof. Luc Brun of ENSICAEN (France)
- **“Approaches to analysis of large networks”** by Prof. Vladimir Batagelj of the University of Ljubljana (Slovenia).

Furthermore, the program included 25 oral presentations organized in 8 sessions on the topics: image and shape analysis, learning and graph kernels, graph matching, large graphs and social networks, mining and clustering, graph edit distance, graphs and information theory, and graph applications. The 25 accepted papers were from 8 different countries (France, Italy, UK, China, Spain, Switzerland, Germany, USA).

During the workshop, the GbR2017 Best Paper award was assigned to the paper “Exact Computation of Graph Edit Distance for Uniform and Non-Uniform Metric Edit Costs” by David B. Blumenthal and Johann Gamper.

The workshop also included a meeting of TC15 (Graph-based Representations), where the members discussed, among other

things, initiatives related to the sharing of datasets and algorithm libraries, education-related initiatives such as the exchange of students and of teachers, and of the possibility of EU-funded projects related to the TC15 activities. Also, at the meeting proposals for GbR2019 were presented and discussed. After the discussion, the participants chose the proposal by the University “F. Rabelais” of Tours (France), presented by Jean-Yves Ramel and Donatello Conte.

The social program of the workshop included a breath-taking walk among the natural wonders and fantastic landscapes of Capri, and a gala dinner at restaurant “Il faro”, just under the island old lighthouse, starting with a cocktail while watching the sun setting on the sea.



The winner of the Best Paper Award, David B. Blumenthal, second from right, together with the members of the award committee.



Some of the participants during the walk to see the Faraglioni and the arco naturale...

The proceedings of the workshop have been published as [Volume 10310](#) in the Lecture Notes in Computer Sciences series by Springer-Verlag. Also, the authors of the presented papers have been asked to submit an extended version of their work for a thematic Special Issue of the journal Pattern Recognition Letters on [Applications of Graph-based Techniques to Pattern Recognition](#) (AppGTPR), that will be published in 2018.

The success of the GbR2017 workshop was undoubtedly made possible by the work and dedication of the members of the organizing committee, and we would like to thank: Gennaro Percannella, Pierluigi Ritrovato, Alessia Saggese, Luca Greco, Vincenzo Carletti, and Antonio Greco.

Conference proceedings



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IAPR Then and Now...30 Years Ago IAPR Newsletter Vol. 10 No. 3, September 1987

NEWS IN BRIEF

INTERNATIONAL COMPUTER VISION CONFERENCE. The 1st International Computer Vision Conference held in London last June was attended by more than 300 people. The conference was organised by the IEEE Computer Society and cosponsored by IAPR. At the conference Prof Azriel Rosenfeld presented David J Heeger of University of Pennsylvania and SRI International the Marr prize for the best paper on computational vision submitted to the conference.

MULTIRESOLUTION IMAGE ANALYSIS A seminar on Multiresolution Image Analysis will be held in Kefar Hamakabia, Israel on September 17, 1987. The meeting is organized by the Information Processing Association of Israel, the IAPR affiliate in Israel

BOOKSBOOKSBOOKS

Algorithmic Advances in Riemannian Geometry and Applications

by Hà Quang Minh and Vittorio Murino, Editors

Springer, 2016

<http://www.springer.com/us/book/9783319450254>

Reviewed by [Tim Zajic](#), Raytheon, Woburn, MA, USA

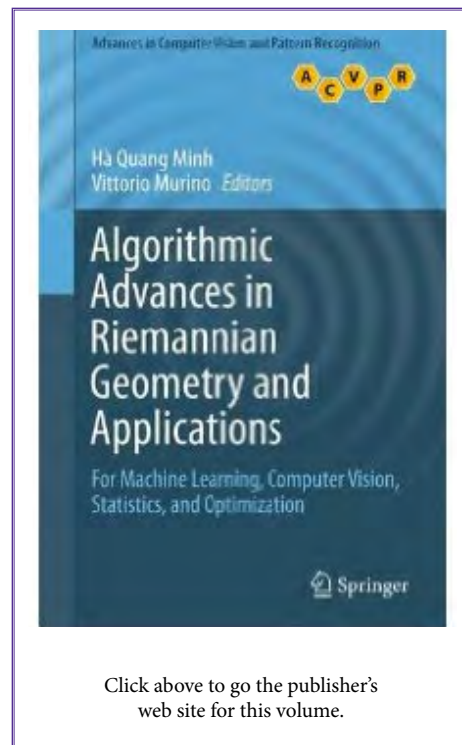
Given either data or a system to model, choosing the space in which to work can play an important role in successfully extracting information from your data or gaining insight into the system being modeled. The book under review focuses on the case in which the space of interest is a manifold equipped with a Riemannian structure. Though the problem of mapping a given data set onto a manifold as a means of dimensionality reduction, well covered in the book [1], is related to the subject matter under review, the focus here is on the treatment of practical problems which have a natural manifold associated with the state or states of interest.

A very simple example illustrating the gain one can obtain by mapping the problem of interest to a manifold is the problem of maximizing a function over the unit circle. While in some cases it may be advantageous to work in Euclidean space and constrain the points to lie on the unit circle, one should consider replacing the two-dimensional x and y coordinates by the one-dimensional angle coordinate. As increasingly complex problems are considered,

the underlying manifold naturally increases in complexity. For introductory treatments of differential geometry and Riemannian manifolds in particular, see the books, [2], [3], [4], [5], with the first the easiest to digest and the last the most challenging.

The book under review consists of eight chapters, each introducing techniques for solving problems on manifolds and illustrating these with examples. In some cases, the authors have made available their software or reference third-party software which the reader can obtain. My own interests in working with manifolds involves target tracking on manifolds and both supervised and semi-supervised learning on manifolds. In looking over the table of contents I realized that reading this book would add to my collection of tools for working with data on manifolds and expose me to new problems treatable by these tools. Let us move on to the actual review.

The first chapter treats the topic of Bayesian statistical shape analysis. The authors model shape variability via random variables on the manifold of diffeomorphic transformations and consider two problems. The atlas problem seeks to find a representative image given a set of input images. An EM approach is taken to estimating the model parameters, with the expectation step replaced by an approximation formed using samples obtained from a Hamiltonian Monte Carlo algorithm. The second problem is a generalization of PCA referred



to as Bayesian principal geodesic analysis (BPGA). Experimental results are demonstrated on brain MRI data. In particular, BPGA is shown to perform better than linear PCA and tangent PCA.

The second chapter treats the problem of sampling constrained probability distributions, a requirement for many applications. Having used more traditional methods for sampling from particular constrained distributions, I was intrigued to learn of the approaches covered here. The authors consider mapping the constrained domain to a sphere in an appropriate space, which they refer to as spherical augmentation, or SA. Monte Carlo approaches are then derived for sampling from the resulting distributions on the sphere; in particular a spherical

Hamiltonian Monte Carlo approach and a spherical Lagrangian Monte Carlo approach. The approaches are illustrated on several examples, including truncated multivariate Gaussians, bridge regression and latent Dirichlet allocation, with performance comparisons made to alternative approaches.

Next comes a chapter treating optimization on manifolds. Specifically the authors treat the manifold of positive definite matrices. Here the concepts of geodesic-convexity and Thompson nonexpansivity play important roles. The authors consider applying the techniques to Gaussian mixture models and maximum likelihood estimation for a class of elliptically contoured distributions. In the former case, they illustrate performance superior to that of the EM algorithm.

Chapter four considers the problems of sparse coding and dictionary learning, doing so on the manifold of symmetric positive definite matrices. As an underlying example, the authors apply their algorithms to covariance descriptors, which arise in image processing applications. The superior performance of the approach put forth is demonstrated on problems including face recognition, texture classification and 3D object recognition.

Moving on to the second half of the book, the authors of chapter five revisit the idea of using covariance matrices for image representation. By applying the kernel approach, or trick, to the data of interest, the covariance matrix is naturally replaced by a covariance operator, acting on a possibly infinite dimensional reproducing kernel Hilbert space. This point of view allows the capture of nonlinear correlations between features. The relevant manifold is the

Riemannian manifold of positive definite Hilbert-Schmidt operators, and the authors provide explicit formulae for two distances on this manifold. As an application of their general framework, the authors consider a 'two-layer kernel machine' for image classification and demonstrate improved performance from their approach.

Sparse coding and dictionary learning comes up again in chapter six. This time the manifold of interest is the Grassman manifold. The Grassman manifold with parameters (p,d) has for points the p -dimensional linear subspaces of the standard d -dimensional real vector space. Two representations of this space are presented along with a discussion of relevant metrics. Sparse coding and dictionary learning are then covered, including a kernel version. An application to classifying actions in videos is considered, demonstrating the algorithm outperforms alternative approaches.

The next to last chapter considers regression on Lie groups. A Lie group is a group that is also a differentiable manifold, with some requirements on the group operations. This is a rather short chapter and it would have been nice to see a little more discussion about Lie groups and their associated Lie algebras. The author puts forth a regression approach, using results from the theory of Lie groups and proposes a tracking algorithm which leverages the regression approach. The algorithm is applied to imagery data and shown to outperform a well-known alternative approach which does not exploit the underlying geometry of the problem.

The final chapter revisits the broad topic touched upon by the first chapter, namely shape

analysis. The authors refer to their framework as elastic shape analysis, a primary component of which is a metric with appropriate invariance properties, referred to as an elastic Riemannian metric. The authors focus includes computing geodesic paths and sample means. Three settings are considered: Euclidean curves, trajectories in Hilbert spaces and axonal trees. Experimental results presented include an application of the techniques presented to digitally reconstructed neurons.

I was glad that I took up the opportunity to review this book. The authors are all experts in their areas and have provided a number of techniques and applications between the covers. In each case an effort has been made to provide enough of the underlying theory supporting the techniques, with explicit references where the interested reader can go for further details. In addition, applications of the algorithms to problems of current interest have been carried out and the performance illustrated.

[1] Jianzhong, W., Geometric Structure of High-Dimensional Data and Dimensionality Reduction, Springer, 2012.

[2] Bloomis, L., Sternberg, S., Advanced Calculus, revised edition, Jones and Bartlett, 1990.

[3] Do Carmo, M., Riemannian Geometry, Birkhauser, 1992.

[4] Boothby, W., An Introduction to Differentiable Manifolds and Riemannian Geometry, Revised Second Edition, Volume 120, Pure and Applied Mathematics, Academic Press, 2002.

[5] Willmore, T., Riemannian Geometry, Oxford Science Publications, 1997.



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~[Owais Mehmood](#), Associate Editor for Book Reviews



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* **"Guide to Medical Image Analysis" (Second edition)** by Klaus D. Toennies: <http://www.springer.com/book/9781447173182>

Furthermore, the next titles due to publish in the series are:

* **"Domain Adaptation in Computer Vision Applications"** by Gabriela Csurka (Ed.): <http://www.springer.com/book/9783319583464>

* **"Deep Learning and Convolutional Neural Networks for Medical Image Computing"** by Le Lu et al. (Eds.): <http://www.springer.com/book/9783319429984>

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* **"Guide to Convolutional Neural Networks"** by Hamed Habibi Aghdam et al.: <http://www.springer.com/book/9783319575490>

* **"Introduction to Intelligent Surveillance"** (Second Edition) by Wei Qi Yan: <http://www.springer.com/book/9783319602271> (forthcoming)



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~[Owais Mehmood](#), Associate Editor for Book Reviews



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* **Deterministic Learning Theory for Identification, Recognition, and Control** by Cong Wang, David J. Hill: <https://www.crcpress.com/Deterministic-Learning-Theory-for-Identification-Recognition-and-Control/Wang-Hill/p/book/9781138112056>

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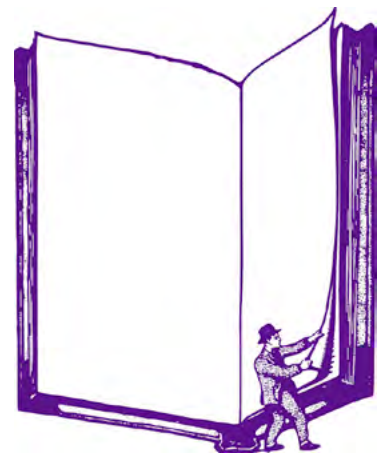
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NOTE: Highlighting indicates that the paper submission deadline is still open.

* Asterisks denote non-IAPR events *

	Meeting	Report on previous edition	Venue
2017	AUG * CAIP 2017 : 17th International Conference on Computer Analysis of Images and Patterns *		Sweden
	CVIP 2017 : 2nd Intl. Conference on Computer Vision and Image Processing & Workshop on Multimedia	CVIP 2016	India
	ICIAP 2017 : 19th Intl. Conference on Image Analysis and Processing	ICIAP 2015	Italy
	ICIG 2017 : The 9th International Conference on Image and Graphics		China
	* GCPR 2017 : 39th German Conference on Pattern Recognition *		Germany
	SEP DGCI 2017 : 20th International Conference on Discrete Geometry for Computer Imagery	DGCI 2016	Austria
	OCT IJCB 2017 : 3rd International Joint Conference on Biometrics		USA
	CIARP 2017 : 22nd Iberoamerican Congress on Pattern Recognition	CIARP 2016	Chile
	GREC 2017 : 12th International Workshop on Grapics Recognition	GREC 2015	Japan
	HIP'2017 : 4th International Workshop on Historical Document Imaging and Processing		Japan
	ICDAR 2017 : 14th International Conference on Document Analysis and Recognition		Japan
	PSIVT 2017 : 8th Pacific Rim Symposium on Image and Video Technology	PSIVT 2015	China
	NOV ACPR 2017 : 4th Asian Conference on Pattern Recognition	ACPR 2015	China
	DICTA 2017 : 2017 International Conference on Digital Image Computing: Techniques and Applications	DICTA 2016	Australia
	DEC PreMI 2017 : 7th International Conference on Pattern Recognition and Machine Intelligence	PreMI 2015	India

2018 meetings on next page...



Meeting and Education Planner

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

* Asterisks denote non-IAPR events *

	Meeting	Report on previous edition	Venue
2018	JAN ICPRAM 2018 : The 7th International Conference on Pattern Recognition Application and Methods	ICPRAM 2017	Portugal
	FEB ICB 2018 : 11th International Conference on Biometrics	ICB 2016	Australia
	MAR MedPRAI 2018 : The Second Mediterranean Conference on Pattern Recognition and Artificial Intelligence	MedPRAI 2016	France
	APR DAS 2018 : 13th International Workshop on Document Analysis Systems	DAS 2016	Austria
	AUG ICPR 2018 : 24th International Conference on Pattern Recognition	ICPR 2016	China



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Arjan Kuijper, Editor-in-Chief
arjan.kuijper@igd.fraunhofer.de

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