

IAPR
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Newsletter

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Special Issue

This Special Issue of the *IAPR Newsletter* highlights the 22nd International Conference on Pattern Recognition.

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Letter from the President



[Ingela Nyström](#)

Uppsala October 3, 2014

It is a great honour for me to have been elected IAPR President for the mandate period until the next ICPR 2016 in Cancun. I attended the first ICPR in Vienna in 1996 and have had close contact with IAPR and ICPR since then. I participated in my first Governing Board (GB) meeting as a GB member representing the Swedish Society for Automated Image Analysis at ICPR 2002 in Québec City. I have been a member of the Executive Committee (ExCo) since 2008 and have bit by bit gotten to know the various aspects of our society. The insights I have gained into the IAPR from my colleagues and through my offices are manifold, one of the strongest being my wish to continue to be involved and to spread knowledge about IAPR.

After the GB meeting when I was elected IAPR President, we sat down around a table in one of the hotel lobbies in Stockholm. On one side of the table, on a sofa, three wise men were seated. (In fact, they are three Past Presidents of IAPR.) Before we parted for the night, I asked them to each give me one piece of advice for the upcoming period as IAPR President.

The first wise man said: Don't lose your sense of humour.

I am the 21st President of IAPR. We all have our personal ways of conducting leadership. I take this

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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/

[CCIW 2015](#)

The 5th Computational Color Imaging Workshop
Saint-Etienne, France
Dates: May 24-26, 2015
Deadline: Oct. 20, 2014

[ICB 2015](#)

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

[MVA 2015](#)

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

[GbR 2015](#)

10th IAPR-TC15 Workshop on
Graph-based Representations in
Pattern Recognition
Beijing, China
Dates: May 13-15, 2015
Deadline: Dec. 31, 2014

[SCIA 2015](#)

19th Scandinavian Conference on
Image Analysis
Copenhagen, Denmark
Dates: Jun. 15-17, 2015
Deadline: Jan. 14, 2015

[ICDAR 2015](#)

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

advice as one that tells me to not try to be someone else by mimicking past presidents, but to stay as myself in the process.

The second wise man said: Don't try to solve everything.

This is good advice in a large organisation. In addition to the day-to-day business of the IAPR, I have selected two new tasks to focus on.

1. We will announce a new award, the Maria Petrou Prize, to honour the memory of our colleague Maria Petrou who sadly passed away in 2012. Maria made substantial contributions to the broad pattern recognition community and to the IAPR during many years. The prize is to be awarded at ICPRs to a female researcher in the field of Pattern Recognition.
2. We will launch an IAPR Research Scholarship for young researchers to spend time at a different institute than their home institute.

Look for these announcements at the IAPR website and in the *IAPR Newsletter*.

The third wise man said: Enjoy the ride.

I realize that being President is a very responsible role and that it puts high demand on its possessor, both in terms of carefulness and the time involved. Nevertheless, I will remember this advice. I will enjoy communicating with many talented people. I will enjoy working on matters that can make a difference for people in our community. I will enjoy taking our international association into the future for the next two years.

Hereby, I thank the three wise men for their advice to me. You know who you are.

It is an honour for me to be on the new ExCo. I find it to be a good mix of old and new experience in the team. The ExCo members are Ingela Nyström (President), Massimo Tistarelli (1st Vice-President), Simone Marinai (2nd Vice-President), Apostolos Antonacopoulos (Treasurer), Alexandra Branzan-Albu (Secretary), and Kim L. Boyer (Past President). We look forward to working with the IAPR community for the next two years. We extend our warmest thanks to the past Past President Denis Laurendeau for his work as member of the ExCo for many

years; he was elected Secretary at ICPR 2004 and served on the ExCo continuously since that time. We also thank outgoing ExCo members Tieniu Tan and Aytul Erçil for their work these past years. Although these three colleagues are no longer ExCo members, we are convinced that they will still participate actively in IAPR activities.

As the IAPR Secretary, I worked closely with Linda O'Gorman and Ed Sobszak in their roles as IAPR Secretariat and IAPR webmaster, respectively. Their abilities and dedication to serve the IAPR are essential for the functionality of the ExCo and to the IAPR as a whole. I cannot thank them enough for the work they are doing, and I am very much looking forward to continuing to work with them in my new role.

This "Letter from the President" has replaced the "From the ExCo" column for this Special Issue of the *IAPR Newsletter*. In future issues, the new Secretary Alexandra Branzan-Albu will report on our work and will highlight the work of others in our community.

Sincerely,

*Ingela Nyström
IAPR President 2014-2016*

IAPR Then and Now: The IAPR's ExCo and Governing Board after ICPR 1984

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Finland: Prof. T. Kohonen
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Hungary: Dr. G. Kozman
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Israel: Dr. S. Peleg

Italy: Prof. S. Levialdi
Japan: Prof. T. Nagao and Prof. M. Takagi
Mexico: Prof. A. Guzman
Norway: Prof. E. Swane
The Netherlands: Prof. E. Backer
Spain: Prof. R. Lopez de Mantaras
Sweden: Prof. J. -o. Eklundh
Switzerland: Prof. M. Kunt
United Kingdom: Prof. Ullmann
USA: Prof. H. Freeman, Prof. K. S. Fu, Prof. A. Rosenfeld and Prof. M. S. Watanabe

Getting to know...Andrea Prati, IAPR Fellow

Andrea Prati, IAPR Fellow

ICPR 2014, Stockholm

*For contributions to
low- and high-level algorithms
for video surveillance*

by [Andrea Prati](#), Department of Design and Planning in Complex Environments, University IUAV of Venice, Italy

I started my research in computer vision and pattern recognition in 1998. Indeed, that year I started my PhD at the University of Modena and Reggio Emilia (Italy) under the supervision of Prof. Rita Cucchiara, but the first year of my PhD study was related to a field on the borderline between image processing and computer architecture. As a matter of fact, my background at that time was more related to computer architecture and my first steps in image processing were on studying cache memory architectures specifically tailored to handle multimedia data, more than on developing new algorithms.

Therefore, I can say I have been involved in the research on computer vision and pattern recognition for the last 15 years. It may sound like not such a long time, indeed, but these have been crucial years for our discipline. I had the honour (but also faced the challenge) to witness a great change in this research field: the change driven by the technological advances in terms of computational power and availability of data, but also by the over-increasing, world-wide interest in our scientific findings.

At the beginning of my research



Andrea Prati (Laurea cum Laude in Computer Engineering, 1998; PhD in Information Engineering, 2002) is currently an Associate Professor at the Department of Design and Planning in Complex Environments at the University IUAV of Venice. From 2005 to 2011 was an Assistant Professor at the University of Modena and Reggio Emilia. In 2013 he was promoted to full professorship, waiting for official hiring in the new position. He collaborated in several research projects, at the regional, national and European level. Moreover, he collaborates with several local companies on specific research projects, some of which have resulted in international patents. Andrea Prati also acted, for the last four years, as evaluator for the EC in the FP7 workprogramme, under the calls of Security.

His research interests belong to different themes, from embedded devices for sensor networks in computer vision applications, to robotic vision, to multimedia, to performance analysis for multimedia computers. However, his main research activity is on video-surveillance topics: object tracking in distributed, multi-camera environments; analysis and removal of the shadows; behavior analysis through trajectory classification. He recently started to research on mobile vision, i.e. the application of sophisticated computer vision techniques on mobile phones.

Andrea Prati is author of more than 130 papers in international journals and conference proceedings (list of publications can be found here: <http://scholar.google.it/citations?user=PJAxU3QAAAAJ&hl=it&oi=ao>). He has been an invited speaker and reviewer for many international journals. He is also Area Editor of the Elsevier journal on Computer Vision and Image Understanding (CVIU), of the Eurasip Journal on Image and Video Processing (JIVP), of the SPIE Journal of Optical Engineering and of the IOS Press Journal on Ambient Intelligence and Smart Environments. He has also organized several special issues of international journals. He was the Program Chair of ICIAP 2007 and of the ACM/IEEE Intl Conf on Distributed Smart Cameras (ICDSC) in 2011, 2012, and 2013 and will be the General Chair for 2014 edition in Venice, Italy. He is a senior member of IEEE, and a member of ACM and GIRPR. Recently, he was elected as a Fellow of the IAPR for contributions to low- and high-level algorithms for video surveillance.

work, researchers had a limited set of data available (on the order of few videos or a hundred images, at the best), while now research papers are often built upon creating new, very large datasets of videos or images. This change has become clear to me during my visit at the CVRR (Computer Vision and Robotics Research) lab at the University of California, San Diego, USA (under the guidance, transformed to friendship in later years, of Prof. Mohan M. Trivedi): an annotated dataset of 5 (five!) videos for the evaluation of shadow detection algorithms has been the basis for related papers for years, whereas now no one will publish a dataset with less than a hundred videos (not to mention, in the case of images, the new ImageNet dataset with more than 14 millions of images! - <http://www.image-net.org/>).

Also in terms of computational power, things have changed a lot during the years of my research. At the beginning, I was programming on a Unix workstation which took hours (sometimes even days) to process data. Now, multi-core CPUs and GPUs have become an indispensable tool in our field in order to get timely experimental results.

Obviously, these two revolutionary changes in our field have been the motivating factors for increasing algorithm complexity: deep learning would have not been possible with only a few samples and limited computational power.

Moreover, it is in front of everyone's eyes that the number of journals, conferences and workshops related to our research area has increased tremendously in recent years. This can be positively attributed to the advances in the field as well as to the increasing interest in it, but, in my humble opinion, it has

also created a large number of low quality events, pushing people to concentrate their efforts on a limited set of top conferences (not my role to list them; we all have our own list!).

Going back to my personal career, most of my life (speaking of research) has been devoted to video surveillance. Even before the events of September 11, 2001, but much more after that, the field of automatic (or intelligent or smart) video surveillance has been widely studied. Again, at the beginning of my career, the focus was on a single camera setup and on basic algorithms such as background suppression and shadow removal. Then (also for the aforementioned reasons) more cameras, on the one hand, and more complex algorithms, on the other hand, came out, shifting the interest to multi-camera setups, people re-identification, tracking under extreme conditions, action and behaviour recognition, and so on. Further interesting research directions, I think, will include the transfer of solutions to well-known problems to real, uncontrolled scenarios and research on higher-level tasks, by really making video surveillance systems "intelligent". I have been working also on other fields, based on the current research projects and interests, ranging from video transcoding, to industrial applications.

There is one field, which I believe can become interesting in the next years for our scientific community, i.e. "mobile vision". This is a relatively new research area where "standard" computer vision and pattern recognition algorithms are implemented on mobile devices (smartphones, tablets, etc.). From discussion with colleagues, there are divergent opinions on this research direction: someone believes that this is just another

platform to play with, where novelty in terms of algorithms will be limited and most of the work is an engineering task; someone else, instead, thinks that this can create new applications and new challenges and that, by addressing them, new algorithms and theories can be developed.

I belong to this second set of people and started working on this area in the last couple of years. It has been for me a return to the past, where computer architecture and software engineering background can play a significant role.

Finally, I cannot finish this short article without thanking all the people, which helped me in getting this fabulous award. They are too many, but three are worth mentioning: Prof. Rita Cucchiara, who introduced me to the field, guided me for more than 10 years and gave me the opportunity to be paid for doing what I liked most; then, Prof. Massimo Piccardi, who for a short, but intensive, period of time has been my colleague and friend, and introduced me to the very essence of doing research; and lastly, but in no way the least, Prof. Mohan M. Trivedi, who allowed me to experience in such a stimulating environment as the CVRR lab at UCSD.



Photo by Kristina Lidayova and Tomas Oravec

Andrea Prati (left) receiving the IAPR Fellow Award from IAPR President Kim Boyer at ICPR 2014.

IAPR...The Next Generation

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

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

~Arjan Kuijper, Editor -in-Chief

by [Avinash Kumar](#), University of Illinois at Urbana-Champaign, USA

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

I first got involved in pattern recognition during my junior year as an undergraduate at the International Institute of Information Technology (IIIT), Hyderabad, India. At IIIT, we had a number of research labs related to pattern recognition, computer vision, databases, nlp etc. which encouraged undergraduates to undertake course projects and get a feel for what research meant. As such, I was trying to find what field really excited me. By the middle of my junior year, I had already worked on a couple of projects in AI, VLSI, but for some reason, I was not getting enticed.

Then, I took a course entitled "Pattern Recognition" in the second term of my junior year. I found the course very exciting. For our finals, we had to do a course project. Together with my project mate, we undertook to build a hand recognition system that would use the hand image of a person to identify the person. Towards the end, we ended up building a rudimentary hardware

Editor's note:

Avinash Kumar received the [Piero Zamperoni Best Student Paper Prize](#) at ICPR 2014 (please see the [ICPR Highlights](#) section in this issue).

~ Arjan Kuijper, Editor-in-Chief

Avinash Kumar is a PhD student in the Electrical and Computer Engineering department at the University of Illinois at Urbana-Champaign, where he is part of the Computer Vision and Robotics Lab (CVRL) located in the Beckman Institute. His research is in the field of camera calibration, depth from focus/defocus, structure from motion and applications of computer vision for the railroad industry.

He obtained his B.Tech degree in Computer Science and an MS by Research degree in Computer Vision from International Institute of

Information Technology, Hyderabad (IIIT-H), where he was associated with the Center for Visual Information Technology (CVIT).

He is a recipient of the the 2007 TA Stewart-Dyer Prize/ Frederick Harvey Trevithick Prize for his work on the application of computer vision to the railroad industry and the 2014 Piero Zamperoni Best Student Paper Award at ICPR for his work on camera calibration.



with a backlit glass surface to place a hand on and a webcam to capture an image from the top. Using simple image features from existing research and nearest neighbor technique learnt in the course, we were able to make it work, which was a truly amazing feeling for me at that point. We were selected as the best class project. In hindsight, I think it was after that course project that I decided to pursue pattern recognition and computer vision and to learn more about them.

Later, in my senior year, I took a course on computer vision. For my final year project, I worked on the problem of omnifocus imaging, where the goal was to fuse a set of focal stack images into a single image where all scene points appear sharp. I proposed this problem as a labeling problem and used discrete optimization techniques to solve it. While working on this project, I got introduced to the problem of focus/defocus in images as well as the problem of discrete optimization in computer vision.

By the time I finished my undergraduate studies in 2005, I was very interested in computer vision, specifically the areas of multi-view geometry and shape from X (stereo, focus etc). Hence, I decided to join the vision lab, called the Center for Visual Information Technology (CVIT) at IIT, Hyderabad, to continue my studies as an MS by Research student and to spend some more time exploring these domains. The vision efforts at CVIT were being spearheaded by Prof. C. V. Jawahar, a leading computer vision researcher, who became my MS thesis advisor. His guidance during the MS program was instrumental in transforming me from an undergraduate to a researcher's mindset.

As a part of this program, I got the opportunity to visit the Computer Vision and Robotics Laboratory (CVRL) at University of Illinois Urbana-Champaign, headed by another eminent computer vision researcher, Prof. Narendra Ahuja, for a year in 2006. Here, I worked on developing a computer vision system that analyzed videos of intermodal freight trains and computed the gaps between the consecutive loads of an intermodal freight train. The gap information would then be converted into the fuel efficiency of the freight train. By using our system, the railroad company was able to analyze the loading pattern of their freight trains and generate suggestions to loading docks to optimally load the trains, leading to huge fuel savings.

After finishing my MS program in 2007, I decided to pursue a PhD degree in computer vision and joined the CVRL lab at UIUC with Prof. Narendra Ahuja as my thesis advisor in 2008.

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

In my PhD research, I initially worked on the problem of focal stack fusion for omnifocus imaging and scene depth estimation. Omnifocus imaging requires selecting the best focused pixel across a set of focal stack images and then combining these pixels into a single image where all scene points appear in focus. The selection of best focus pixel is governed by a focus measure metric which is typically based on computing some form of gradient measure in a window around each candidate best focused pixel and finding the window across the focus stack which maximizes this measure. But, such a measure sometimes would lead to edge bleeding at intensity edges in the final omnifocus image as defocus

gradients leaked into smooth focused regions at intensity edges and thus maximized gradient based measures for defocused pixels. I came up with a new generative focus measure which would not suffer from this problem.

There are a number of ways to capture a focal stack, e.g. moving the sensor plane along the optic axis, changing aperture diameter. One of the ways that I used for data acquisition in my omnifocus imaging work was using a tilted sensor camera, rotating about its optic center and imaging the scene. Due to the tilt of the sensor and its rotation, each scene point would get images with varying degrees of focus, thus allowing us to capture a focal stack. One of the problems that we faced here was to compute the tilt of the sensor.

This led me to the field of camera calibration which became a major part of my PhD research. In this, I looked into the problem of a generic setting where the sensor can be assumed to be tilted even for conventional cameras and the typical decentering distortion modeling could be replaced by explicit sensor rotation angles as new intrinsic parameters. In such a setting, I used different geometric constraints like collinearity and radial alignment to come up with two different analytical solutions to camera calibration when the lens and sensor are modeled as being tilted.

Focal stacking and camera calibration have a lot of applications in industry. With the advent of omnipresent smart-phone cameras and low cost DSLRs, these applications can be used by common people to accomplish various computational photography tasks. Now, I am focusing on developing an end to end system which can do focal stacking, omnifocus imaging and

scene depth estimation by using such commonly available input devices. There are many real life vision challenges which we typically ignore in controlled lab settings for such problems, e.g. object motion, camera shake etc. and which we hope to alleviate in this process.

How can the IAPR help young researchers?

I think in recent years, the IAPR has already taken lot of steps to help young researchers in the form of organizing workshops and competitions at their premier conferences. They also provide

travel support to attend the conferences.

A few more things that I can think of are if, in addition to conferences, there can be summer schools for a couple of weeks where eminent researchers can be invited for lectures. I think such schools would really help nascent PhD students who are looking into research problems to work for during their PhD and also allow them to develop collaborations with researchers across universities during their PhD research.

My other suggestion would be to invite researchers from

other disciplines to give talks at huge events like ICPR, so that researchers in pattern recognition and computer vision can get exposure to other fields where their research can be applied. In my experience and discussions with fellow researchers in other fields, there are a plethora of problems in their areas just begging to be solved using the techniques developed in pattern recognition.

In summary, some ways could be sought by IAPR to encourage and inspire inter-disciplinary research.

The Piero Zamperoni Best Student Paper Award

It is the policy of the IAPR to make an award at each ICPR for the best paper authored by a student. The primary purpose of this award is to acknowledge and encourage excellence in pattern recognition research by students, and to help assure the future livelihood of the field. The award also honours the memory of Dr. Piero Zamperoni, an outstanding educator in pattern recognition.

Eligibility for the award is restricted to papers authored or co-authored by a student. There must be no more than two authors, and if only one author of a co-authored paper is a student, then the other author must certify that the work presented in the paper is primarily the work of the student. The student author must have been a registered student at the time of paper submission.

When submitting their contributions, students should make known that they satisfy the education criteria. Students should receive, together with the acceptance notification, a request to provide two extra copies of their camera-ready contribution (for the Education Committee, who will also be sent all the relevant review forms from the conference papers reviewing bodies).

The selection of the award winner is made by the IAPR Education Committee. The selection criteria include the following:

- topic: the paper should make its contribution in the field of pattern recognition;*
- technical quality: the paper's technical contribution should be as important as possible, highly original and technically sound;*
- presentation: the paper should communicate its results in an exemplary style, with strong organisation, appropriate discussion of prior work, and general clarity and integrity.*
- It is the responsibility of The Education Committee to try to find suitable sponsorship for the award so as to fund some token to be presented to the winner.*

The rules for the competition for the award will be published on the ICPR web site. The name of the winner will be announced both in the IAPR Newsletter and on the IAPR web site and the award will be presented at the ICPR conference banquet.



22nd INTERNATIONAL
CONFERENCE ON
PATTERN
RECOGNITION

Highlights

Comments from the General Chair

[ICPR 2014, Stockholm:
old friends; new places](#)

[Plenary Talk Abstracts:
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Jitendra Malik
and
J. K. Aggarwal Prize
Arun Ross](#)

[Invited Talk Abstracts:](#)

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- [Mark Girolami](#)
- [Nikos Paragios](#)
- [Fei-Fei Li](#)
- [Stan Z. Li](#)

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PRRS 2014, CVAUI 2014, the
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[2014 IAPR Fellows](#)

[ICPR 2014 Paper Awards:](#)

- [BIRPA and Zamperoni](#)
- [IBM Best Student Papers](#)
- [Best Scientific Papers](#)

[2014 Meeting of the IAPR
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Photo by Kristína Lidayová
and Tomáš Oravec

Comments from the ICPR2014 General Chair

So, after five years of planning, suddenly it's over. Five years planning for a five-day conference. The feelings are mixed, but there is certainly a touch of relief that it all went well. And this is mainly due to the fantastic work by the members of the organizing committee. In particular, I want to highlight the fantastic work by Ingela Nyström, who skillfully managed the local arrangements, and Anders Heyden and Michael Felsberg, who organized the technical program all the way from the review process to the publication of the proceedings.

About 1,300 reviewers, 83 area chairs and 16 track chairs helped us to select 198 oral and 594 poster presentations from the total 1,409 submissions. These were presented at five parallel tracks. 1,215 participants from 58 countries visited the conference. It's a huge number of people that have contributed to this conference in one or another way, and I'm grateful for all their efforts.

Despite its long history – the ICPR conference series started in 1973 – this was the first time it was held in Sweden. I hope that all involved will look back on ICPR 2014 with pride and gratification.

~[Magnus Borga](#), ICPR 2014 General Chair,
Linköping University, Sweden



Photo by Linda O'Gorman

ICPR 2014, Stockholm: old friends; new faces and places

by Linda O'Gorman, IAPR Secretariat

For me, ICPR has always been a chance to see old friends, meet new people and explore a different part of the world. ICPR 2014 in Stockholm was no exception.



Arriving on Saturday gave us a chance to see some sites in Stockholm

before the conference began. First on the list, the Vasa Museum. This Swedish warship proves the value of engineering. It was built in 1628 by master craftsmen with no knowledge of engineering plans. The result: it sank in Stockholm Harbor on its maiden voyage after sailing only about 1,300 meters. It stayed on the ocean floor for 333 years until it was brought up in 1961. It has since been restored and housed in this unique museum space.



For triathlete researchers and scientists, the Vattenfall World Triathlon, Stockholm, was well



timed, Sunday, August 24th, in Gamla Stan. Did any ICPR attendees compete? Let me know if you or someone you know did, secretariat@iapr.org.

Once the conference began, I was lucky to be situated in a central location in the beautiful, new conference venue with its fantastic view of the Stockholm City Hall. This was great, since the City Hall was also on the list of sights one must see in Stockholm. In addition to the great view every day, we were also treated to a welcome



Photo by Kristina Lidayová and Tomáš Oravec

reception in the magnificent Blue Hall (home of the Nobel Prize dinner each December) and the Golden Hall with huge art deco mosaics covering its walls.

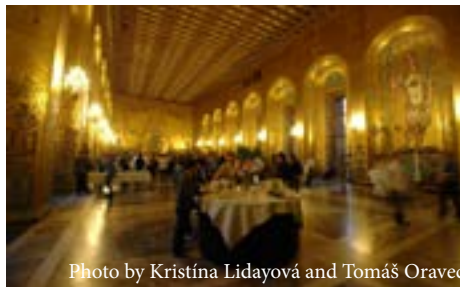


Photo by Kristina Lidayová and Tomáš Oravec

So, what does the IAPR Secretariat do at ICPR? As an international organization, the IAPR can seem "faceless". At ICPR, I provide a "face" for the

IAPR: someone who can answer questions about the organization and assist the IAPR leadership during the event. (If you're wondering what the Office of the Secretariat is, I refer you to this description in the [April 2005 issue of the IAPR Newsletter](#).)

In my booth on the exhibition floor, I could easily be found for these purposes, and during quieter moments, it



Photo by Kristina Lidayová / Tomáš Oravec

was great to visit with people I see only every two years and also to meet many new people.

The conference ended on Thursday afternoon, but my sightseeing did not. I found some time to walk across the harborfront to catch a tremendously informative tour of the Moderna Museet. I was excited to see and hear about the Swedish interpretation of various art movements in the modern period.



Not only was ICPR 2014 an exceptionally well-organized and enjoyable event, it also gave me (and I'm sure all of the participants as well) some wonderful Swedish experiences.



Winner of the 2014 K. S. Fu Prize Jitendra Malik

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

K. S. Fu Prize Lecture: The Three R's of Computer Vision: Recognition, Reconstruction and Reorganization

Abstract

We have seen remarkable progress in computer vision in recent years thanks to a virtuous confluence of better algorithms and models, faster computers, and the availability of large datasets. I will argue that further progress on the classic computational problems of computational vision: recognition, reconstruction and re-organization requires us to study the interaction among these processes. For example, recognition is reciprocally linked to re-organization, with bottom-up grouping processes generating candidates, which can be classified using top down knowledge, following which the segmentations can be refined again. Recognition of 3D objects could benefit from a reconstruction of 3D structure, and 3D reconstruction can benefit from object category-specific priors. I will sketch recent projects at UC Berkeley such as R-CNN (regions with CNN features), MCG (multiscale combinatorial grouping), SDS (simultaneous recognition and segmentation), and instance-level segmentation on RGB-D images, that have achieved state-of-art results on benchmark problems. Publications may be found at <http://www.eecs.berkeley.edu/Research/Projects/CS/vision/>



Winner of the 2014 J. K. Aggarwal Prize Arun Ross

"For contributions that dvance the state of the art in biometric technologies
and extend biometric infrastructure"

J. K. Aggarwal Prize Lecture: Biometrics: From Pattern Recognition to Data Privacy

Abstract

Biometrics refers to the automated recognition of individuals based on their anatomical and behavioral traits such as fingerprint, face, iris, voice, gait and signature. A classical biometric system may be viewed as a pattern recognition engine that extracts a set of discriminative features from the input biometric data and compares this against a set of stored "templates" in order to determine a match. Thus, a significant number of biometric papers deal with data acquisition, quality enhancement, feature extraction, and matching. However, the study of biometrics extends beyond pattern recognition and engages researchers from many fields such as computer vision, signal processing, cognitive psychology, sensor design, forensics, information security, physiology, medicine, human factors/ergonomics, cryptography, etc. Further, since a biometric system deals with the personal information of an individual, aspects related to data privacy are also being addressed. Thus, an operational biometric system has to contend with a broad gamut of problems ranging from robust pattern recognition to provable data security/privacy in diverse unconstrained scenarios. In this talk, we will first discuss the range of research activities being conducted in the biometrics community, and then present some of our work on heterogeneous face recognition; multibiometric indexing; cross-modality matching of face and iris; and privacy enhancement using visual cryptography and mixing schemes.

Invited talk in Computer Vision



Kenichi Kanatani

Statistical Optimization for Geometric Estimation: Minimization vs. Non-minimization

Abstract: We overview techniques for optimal geometric estimation from noisy observations for computer vision applications. We first describe techniques based on minimization of a given cost function: least squares (LS), maximum likelihood (ML), and Sampson error minimization. We then summarize techniques not based on minimization: one solves a given matrix equation. Different choices of the matrices in it result in different methods: LS, iterative reweight, the Taubin method, renormalization, HyperLS, and hyper-renormalization. Doing statistical analysis and conducting numerical examples, we conclude that hyperrenormalization is the best method in terms of accuracy and efficiency.

Invited talk in Pattern Recognition and Machine Learning



Mark Girolami

Putting the Scientist in the Loop—Accelerating Scientific Progress with Interactive Machine Learning

Abstract: Technology drives advances in science. Giving scientists access to more powerful tools for collecting and understanding data enables them to both ask and answer new kinds questions that were previously beyond their reach. Of these new tools at their disposal, machine learning offers the opportunity to understand and analyze data at unprecedented scales and levels of detail.

The standard machine learning pipeline consists of data labeling, feature extraction, training, and evaluation. However, without expert machine learning knowledge, it is difficult for scientists to optimally construct this pipeline to fully leverage machine learning in their work. Using ecology as a motivating example, we analyze a typical scientist's data collection and processing workflow and highlight many problems facing practitioners when attempting to capitalize on advances in machine learning and pattern recognition. Understanding these shortcomings allows us to outline several novel and underexplored research directions. We end with recommendations to motivate progress in future cross-disciplinary work.



Invited talk in Biomedical Image Analysis

Nikos Paraglos

Discrete Visual Perception

Abstract: Computational vision and biomedical image have made tremendous progress of the past decade. This is mostly due the development of efficient learning and inference algorithms which allow better, faster and richer modeling of visual perception tasks. Graph-based representations are among the most prominent tools to address such perception through the casting of perception as a graph optimization problem. In this paper, we briefly introduce the interest of such representations, discuss their strength and limitations and present their application to address a variety of problems in computer vision and biomedical image analysis.

ICPR 2014 Highlights

Invited talk in Image, Speech, Signal and Video Processing



Fei-Fei Li

Learning Features and Parts for Fine-Grained Recognition

Abstract: This paper addresses the problem of fine-grained recognition: recognizing subordinate categories such as bird species, car models, or dog breeds. We focus on two major challenges: learning expressive appearance descriptors and localizing discriminative parts. To this end, we propose an object representation that detects important parts and describes finegrained appearances. The part detectors are learned in a fully unsupervised manner, based on the insight that images with similar poses can be automatically discovered for fine-grained classes in the same domain. The appearance descriptors are learned using a convolutional neural network. Our approach requires only image level class labels, without any use of part annotations or segmentation masks, which may be costly to obtain. We show experimentally that combining these two insights is an effective strategy for fine-grained recognition.

Invited talk in Document Analysis, Biometrics and Pattern Recognition Applications



Stan Z. Li

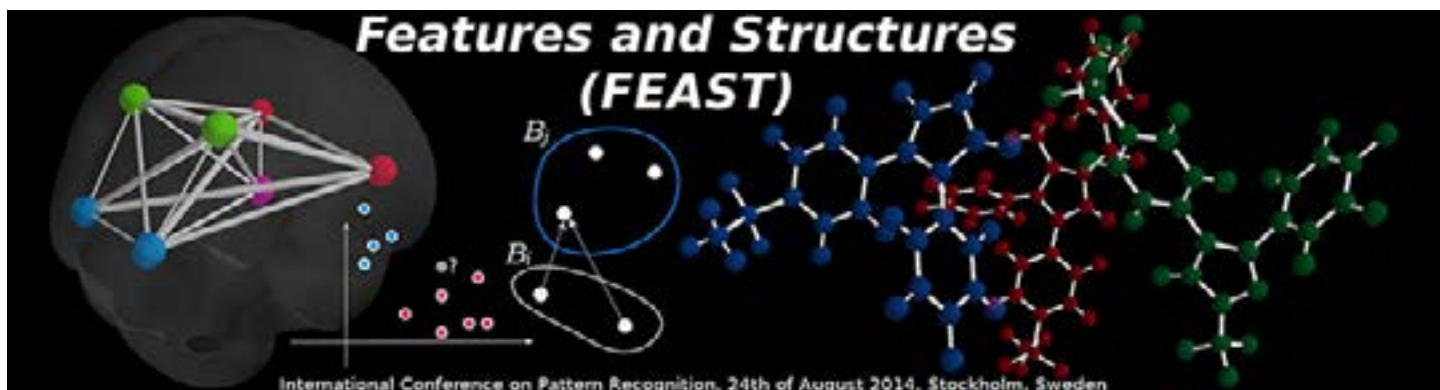
Deep Metric Learning for Person Re-identification

Abstract: Various hand-crafted features and metric learning methods prevail in the field of person re-identification. Compared to these methods, this paper proposes a more general way that can learn a similarity metric from image pixels directly. By using a “siamese” deep neural network, the proposed method can jointly learn the color feature, texture feature and metric in a unified framework. The network has a symmetry structure with two sub-networks which are connected by a cosine layer. Each subnetwork includes two convolutional layers and a full connected layer. To deal with the big variations of person images, binomial deviance is used to evaluate the cost between similarities and labels, which is proved to be robust to outliers. Experiments on VIPeR illustrate the superior performance of our method and a cross database experiment also shows its good generalization.

**Biographies of each of
the ICPR 2014 Invited Speakers
can be found at the
[ICPR 2014 web site.](#)**

ICPR 2014 Workshops, Tutorials and Contests

A complete [list of the workshops, tutorials and contests](#) held in conjunction with ICPR 2014 can be found at the ICPR 2014 web site. This section of the IAPR Newsletter contains reports from some of them.



<https://sites.google.com/site/feast2014/>

Workshop Organisers:

[Veronika Cheplygina](#) (Delft University of Technology, The Netherlands)
[Aasa Feragen](#) (University of Copenhagen, Denmark)
[Niklas Kasenburg](#) (University of Copenhagen, Denmark)
[Marco Loog](#) (University of Copenhagen, Denmark)

by Veronika Cheplygina, Workshop Co-organiser

The First Workshop on Features and Structures (FEAST) was held in conjunction with the 22nd International Conference on Pattern Recognition. The aim of the workshop was to bring together researchers who deal with data where both vectorial and structural representations are involved, such as natural language processing, medical imaging, computer vision, bioinformatics, social network analysis and many others. Such data poses several open problems, such as how to combine discrete structure with continuous attributes when defining similarities of objects, or how to perform feature selection. To encourage discussion and participation, the acceptance

rate was set high and abstracts of published papers as well as on-going works were both welcomed.

In total, 70 participants registered for the workshop, which resulted in high attendance throughout. The official program consisted of six oral presentations and 15 posters, but all participants were encouraged to bring a poster, and the actual number of posters was larger. The topics of the abstracts reflected the scope of the workshop very well, as different problems (representation, classification, feature selection) in different applications (computer vision, medical imaging, bioinformatics) were covered. The abstracts, as well as presentation slides, can be found online at <https://sites.google.com/site/feast2014/program>.

A notable highlight throughout most of the talks was that the speakers were not only answering questions from, but also asking questions to the audience, which was exactly what



ICPR 2014 Highlights

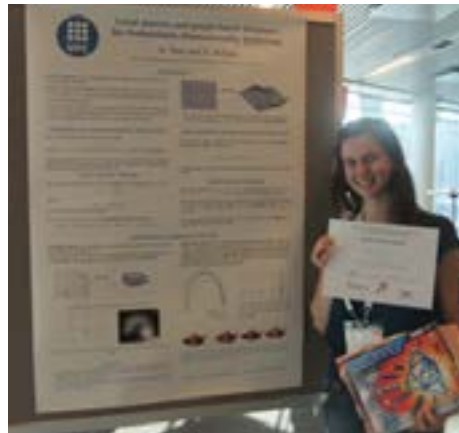
the open setup of the workshop was meant to achieve.

Two invited speakers presented their work where feature and structural representations are combined. [Luca Rossi](#) (University of Birmingham) talked about a graph kernel based on the quantum Jensen-Shannon divergence. While the classical random walk graph kernel compares the walks that can be taken throughout two graphs, the proposed approach first represents each graph by the density matrix associated with a continuous-time quantum walk over that graph. The kernel, then, is defined as the J-S divergence between density matrices. This results in some interesting properties, such as that the continuous-time quantum walk does not have a limiting distribution. As a result, the problem of tottering (random walks that go back and forth), which is a disadvantage in the classical random walk kernel, is reduced.

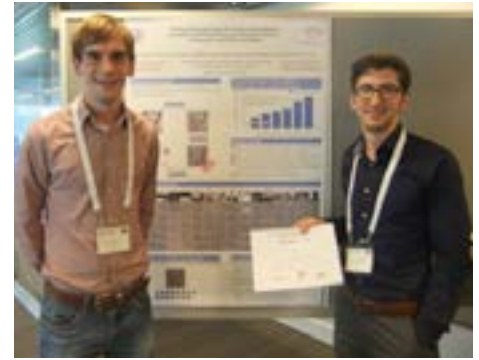
[Brijnesh Jain](#) (TU Berlin) talked about a framework in which attributed graphs are represented as points in a quotient space, called graph orbifolds. Such representation allows concepts

such as length, angle and derivatives to be transferred from vector spaces to the domain of graphs. One of the results is that for supervised learning on graphs, empirical risk minimization with a differentiable loss function becomes more tractable. Results on both supervised and unsupervised learning problems show that the framework is an elegant addition to the existing learning algorithms for graphs.

The day was concluded with a well-visited poster session, which was accompanied by drinks sponsored by Prime Vision (<http://www.primevision.com>). After a lot of lively discussions at the posters, it was time for the poster prize announcement. Two poster prizes



Alessandra Tosi



Paul Bodesheim and Johannes Rühle

were awarded: one to Alessandra Tosi for the poster "Local metric and graph based distance for probabilistic dimensionality reduction", and one to Alexander Freytag, Johannes Rühle, Paul Bodesheim, Erik Rodner and Joachim Denzler for the poster "Seeing through bag-of-visual-word glasses: towards understanding quantization effects in feature extraction methods". In addition to a certificate, both winners received a Geomag construction set to build geometric shapes and structures to their liking.

All in all, this first FEAST workshop was very successful, and some of the enthusiasts already hinted at a follow-up... So keep an eye out for any upcoming announcements!

FEAST 2014

[Click here for abstracts and presentation slides.](#)

VAIB 2014

4th Visual observation and analysis of Vertebrate And Insect Behavior

<http://homepages.inf.ed.ac.uk/rbf/vaib14.html>

ICPR 2014 Workshop, August 24, 2014, Stockholm, Sweden

Workshop Organizers:

Robert Fisher (University of Edinburgh, UK)
John Hallam (University of South Denmark, Denmark)
Bas Boom (University of Edinburgh, UK)
Concetto Spampinato (Università di Catania, Italy)

by Robert Fisher

The 4th Visual observation and analysis of Vertebrate And Insect Behavior (VAIB) workshop was held as part of the 22nd International Conference on Pattern Recognition (ICPR) in Stockholm. It was a full day workshop held the day before the main conference, but in same venue, the new Waterfront conference centre.

While somewhat of a niche area, the people interested in applying the technology presented here are increasing rapidly: terrestrial and aquatic farmers monitoring their

animal stock, zoo veterinarians monitoring their collection, biologists and drug companies observing rodents and fruit flies for behavioural changes, ecologists monitoring insect and other wild species populations, etc. This is leading to a common set of problems needing solving, typically in an uncontrolled outdoor environment: target detection and tracking, shape measurement, and animal counting.

A particular highlight of the workshop was the invited talk by Prof. Alexandra Branzan Albu from the University of Victoria, on

“Automated Analysis of Deep-Sea Cabled Observatory Video Data”.

In addition to the invited talk, there were 11 other talks presented, in five themes: ‘Large Animals’, ‘Rodents’, ‘Aquatic Animals’, ‘Insects’, and ‘Other Species’. The presentations were selected based on an extended abstract, which were given a ‘light-touch’ peer review. This format was chosen because we wanted to encourage early presentation of work-in-progress and to provide a forum for people to air untested ideas, with the hope that this would help the researchers advance their work.

VAIB 2014

[Click here](#) for the workshop web site with links to presented papers.

IWCF 2014

6th IAPR International Workshop on Computational Forensics

<http://www.isical.ac.in/~iwcf2014/>

ICPR 2014 Workshop, August 24, 2014, Stockholm, Sweden

Workshop Co-Chairs:

Utpal Garain (Indian Statistical Institute, India)

Faisal Shafait (University of Western Australia, Australia)

by Utpal Garain, Workshop Co-Chair

The 6th IAPR Int. Workshop on Computational Forensics (IWCF) was organized on behalf of the IAPR Technical Committee on Computational Forensics (TC-6)

The Workshop Goal: The 6th IWCF aimed at exploring the role of pattern recognition and machine learning principles for analysing problems in forensics. The workshop put emphasis on forged document analysis both in hard copy and digital media. Analysis of handwriting or signature, detection of change in original documents, writer/speaker identification and verification, and copyright violation were some of the areas of emphasis. Efforts were to bring researchers together who are working on these issues in different areas including document and speech processing, music analysis, digital security, forensic sciences etc.

Preparation: Preparation began just after the proposal was accepted by the ICPR workshop committee. Two calls for papers were issued. Abstracts for 23 papers were registered, and in the end 18 full papers were submitted. All the papers underwent a rigorous review process. The program committee consisting of

19 researchers tried to have three reviews for each paper. Based on these reviews, only 13 papers were accepted for presentation in the workshop.

Participation: The 6th IWCF received a nice response from researchers not only in terms of research paper submission but also in terms of actual participation in the workshop. 22 researchers registered for the workshop. Among these participants 14 researchers were authors and speakers presenting their papers or talks and eight researchers were attending the workshop based on their interest in the field.

Research Papers: The accepted papers addressed different areas of computational forensics. Almost half of the papers were on image processing applied to forensics purposes. These papers dealt with palmprint, iris, halftone images, in particular, and document images, in general. There were papers on art forgery and speech processing for forensic needs. One paper addressed processing of instant messages and voice of IP whereas another paper presented research on analysis of Windows event logs. The accepted papers came from 10 countries. Three papers were from France, and two papers from India. Single papers came from each of these countries: Germany,

UK, Ireland, Canada, Australia, Russian Federation, Malaysia and Cuba.

Workshop Keynote Address and Invited Talk:

Mr. Paul Lahmi, CEO of Send Only Oked Documents (SOOD), France, delivered the workshop keynote address. Mr. Lahmi, in his talk, addressed two important research issues of Document Authentication: (i) Authenticating shared information (patented) and (ii) Copyright management, Encryption, Watermarking (patented).

The workshop invited talk was delivered by Prof. Jean-Marc Ogier. Prof. Ogier discussed the different facets of forensics in document analysis.

Industry Involvement: The workshop keynote address was sponsored by Send Only Oked Documents (SOOD), France. The company does research on document authentication and develops related products. The company's CEO, Mr. Paul Lahmi, shared his research experience with the participants and also addressed the future challenges in the area of computational forensics.

IWCF Shared Task: For the first time, there was a call for holding a shared task in IWCF. One research

group from Malaysia responded to this call and organized a competition on Recognition of Android Malware Patterns (RAMP). Several groups registered to participate in this shared task. However, only one group finally submitted their results.

Discussion Forum: A special discussion forum session was organized in the workshop. The session was chaired by the IAPR TC-6 Vice-Chair, Prof. Marcus Liwicki. The participants who attended the workshop without any papers or talks were initially given a chance to share their research or products by making brief presentations. Later discussions started to identify niche areas where IAPR TC-6 can contribute. Collaboration with other groups working on digital forensics was also discussed. Preparation of sharable data and systems was emphasized. Many researchers shared their views for formulating the future course of action for IAPR TC-6.

Proceedings, Post-proceedings and Edited Volume: The workshop proceedings was distributed among the participants as pen-drive proceedings. The post-proceedings will be published by Springer LNCS. The participants will be contacted in October 2014 to submit revised versions of their papers. The papers will be reviewed afresh and the decisions are likely to be made in December 2014. Springer has also contacted the workshop chairs to explore the possibility of bringing out an edited volume on the research areas covered by IWCF. The IAPR TC-6 will soon work on this proposal.

[AMMDS 2014](#)

2nd Workshop on Activity Monitoring by multiple distributed sensing

<http://www.ino.it/ammds/>

ICPR 2014 Workshop, August 24, 2014, Stockholm, Sweden

Workshop Organisers:

[Pier Luigi Mazzeo](#) (Istituto Nazionale di Ottica, Italy)

[Paolo Spagnolo](#) (Istituto Nazionale di Ottica, Italy)

[Thomas B. Moeslund](#) (Aalborg University, Denmark)

by Pier Luigi Mazzeo, Workshop Co-Organiser

The focus of the Workshop was on distributed computing issues in large scale networked sensor systems (including algorithms and applications, systems design techniques and tools, in-network signals and information processing). The aim of this workshop was to bring together researchers from different communities (such as computer vision, networked embedded sensing, artificial intelligence etc.), all addressing the problem of interpretation of the information coming from multiple distributed sensing systems.

The presence of this workshop at ICPR attracted researchers from a multiple distributed sensing domain that play a central role in future technology (ambient intelligence, surveillance for security, sportive application, social intelligence, etc.).

Topics:

- Single and multiple object tracking
- Re-identification
- Human behavior analysis
- Individual activity detection and recognition
- Multi-agent/multi sensing activity detection and recognition
- Scene understanding
- Sensor calibration
- Event detection
- Distributed collaborative information processing
- Abstractions for modular design

The workshop was very successful with nine talks of high-level research given by scientist from prestigious universities (i.e. in South America, Europe and Asia).

All the contributions will be published by Springer as post-proceedings in the volume Number 8703 of the LNCS series.

PRRS 2014 **8th International Workshop on Pattern Recognition in Remote Sensing**

<http://iapr-tc7.de/prrs/PRRS2014.htm>

ICPR 2014 Workshop, August 24, 2014, Stockholm, Sweden

Workshop Chairs:

Jenny Du (Mississippi State University, USA)

Eckart Michaelsen (IOSB, Germany)

Bing Zhang (Institute of Remote Sensing and Digital Earth, China)

by Jenny Du,
Workshop Co-
Chair

The Pattern
Recognition
in Remote
Sensing series
of workshops
is organized

by the Technical Committee 7 (Remote Sensing and Mapping) of the International Association for Pattern Recognition (IAPR) and is co-sponsored by the IAPR, the IEEE Geoscience and Remote Sensing Society (GRSS), and the International Society for Photogrammetry and Remote Sensing (ISPRS) working group "III/VII: Pattern Analysis in Remote Sensing". The proceedings, including the 14 papers presented at the PRRS 2014, will be published in [IEEE Xplore](#). A special issue on "Advances in Pattern Recognition in Remote Sensing" will appear in Pattern Recognition Letters. The submission deadline is July 15, 2015.

As we know, pattern recognition has many important applications in remote sensing. With large volumes of remote sensing data being acquired from new-generation sensors and



"Hierarchical analysis of hyperspectral images" was provided by [Professor Jocelyn Chanussot](#) from Grenoble Institute of Technology in France.

image resolutions (e.g., spatial, spectral, temporal, radiometric) being improved dramatically, it requires further advances of pattern recognition algorithms and techniques. The PRRS Workshop provides an excellent forum for both communities to exchange ideas and experiences so that better understanding from theoretical and application aspects can be gained for mutual benefit.

16 papers were submitted and reviewed with a double-blind review process. The 14 selected papers covered a wide range of topics, including SAR image processing, hyperspectral image processing, urban image scene interpretation from remote sensing data (e.g., airborne images, digital surface models, LiDAR data), and other various applications of remote sensing assisted with pattern recognition techniques.

A keynote presentation on

We would like to take this opportunity to thank the PRRS 2014 Program Committee members for their efforts in paper review. We also thank all the authors and keynote speaker for their contributions, the IAPR, the IEEE GRSS, and the ISPRS working group III/VII for their sponsorship. We are grateful to the local organizers of ICPR 2014 for their assistance.

Looking forward to PRRS 2016 in Cancun, Mexico!



Workshop Chairs (from left to right: Michaelsen, Du, Zhang) and ISPRS WG III/VII Chair Prof. Uwe Stilla (rightmost)

International Conference on Pattern Recognition Workshop: Computer Vision for Analysis of Underwater Imagery

24 August 2014
Stockholm, Sweden

<http://cvaui.oceannetworks.ca>

Organizers:

Alexandra Branzan Albu (University of Victoria, Canada)
Maia Hoeberechts (Ocean Networks Canada, Canada)

by the Workshop Organizers

On 24 August 2014, 25 researchers from around the world gathered in Stockholm for the ICPR workshop on Computer Vision for Analysis of Underwater Video (CVAUI 2014).

Monitoring marine ecosystems is of critical importance for gaining a better understanding of their complexity, including the effects of climate change and other anthropogenic influences on marine environments. The analysis of underwater imagery imposes a series of unique challenges, which need to be tackled by the computer vision community in collaboration with biologists and ocean scientists.

This workshop provided a forum for researchers to share and discuss new methods and applications for underwater image analysis. The workshop received 19 full-length paper submissions, out of which 11 were accepted based upon a thorough, double-blind peer review process. The technical program of the symposium covered a variety of topics and applications, such as seafloor classification, species identification, image enhancement



Photo by Kristína Lidayová and Tomáš Oravec

and restoration etc.

The workshop program also included three [keynote talks](#). Dr. Jules Jaffe, a research oceanographer with the Marine Physical Laboratory at Scripps Oceanography, U. C. San Diego, gave a talk entitled “Underwater Optical Imaging: Past, Present, and Prospects”. Dr. Benjamin Richards, from NOAA Pacific Islands Fisheries Science Center, talked about the “NOAA Fisheries Strategic Initiative on Automated Image Analysis”. Finally, Dr. Robert Fisher, Professor in the School of Informatics, Edinburgh University,

updated the participants on a major European initiative in his talk, “Data Acquisition and Analysis in the Fish4Knowledge Project.”

Plans have already begun for a follow-up workshop at ICPR 2016 in Cancun, Mexico.

Workshop and Contest Report



General and Technical Chairs:

[Brian C. Lovell](#) (University of Queensland, Australia)

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

by [Arnold Wiliem](#), University of Queensland, Australia

The Workshop Report:

The First Workshop on Pattern Recognition Techniques for Indirect Immunofluorescence Images aimed to provide a solid platform for practitioners in indirect immunofluorescence image analysis, one of the emerging fields in the pattern recognition community.

The workshop received 15 paper submissions with two being withdrawn, leaving 13 papers to consider. These 13 papers comprised 7 papers submitted in short paper format and 6 in long paper format. Whilst the general topic in Indirect Immunofluorescence image analysis is covered in the long papers, the short papers are intended to document the top performing systems in the International Contest on Performance Evaluation of Indirect Immunofluorescence Image Analysis. The contest itself had 18 algorithm submissions.

We thank the reviewers and the members of program committees from around the world who put their effort into reviewing the

submissions. The workshop employed the standard double-blind peer-review protocol for the long paper format. However, we selected the short papers based on superior performance of the corresponding algorithm in the contest as well as the quality of the submission. From the 18 contest submissions, we sent 12 short paper invitations to the best teams. The submitted papers were then reviewed based on their quality and clarity of presentation. Finally 12 papers were accepted comprising 5 long papers and 7 short papers.

We must thank Alessia Saggese, Azadeh Alavi, and Patick Zhang for their support in making the algorithm and paper review process run so smoothly. We also thank Peter Hobson and Tony Jennings for their work as industrial liaison.

We acknowledge our technical Co-Sponsors: IEEE and IEEE Computer Society. The workshop was also endorsed by the IAPR and the APRS.

**Proceedings
are available through
[IEEEExplore](#)**

The Contest Report:

The Performance Evaluation of Indirect Immunofluorescence Image Analysis Systems (the Contest link at <http://i3a2014.unisa.it/>) held at the 22nd International Conference on Pattern Recognition (ICPR 2014) was a benchmarking activity aimed to enlarge the community of researchers in the field of Pattern Recognition on the Indirect Immunofluorescence Images (IIF) Analysis.

The IIF is a diagnostic methodology based on image analysis that reveals the presence of autoimmune diseases by searching for antibodies in the patient serum. IIF uses the human larynx carcinoma (HEp-2) substrate, which bonds with serum antibodies forming a molecular complex. This complex then reacts with human immunoglobulin conjugated with a fluorochrome and becomes observable at the fluorescence microscope where it reveals the antigen-antibody reaction. Due to its effectiveness in recent years, we have assisted to a growing demand of diagnostic tests for systemic autoimmune diseases.

The interest in the realization of Computer Aided Diagnosis in this

ICPR 2014 Highlights

medical domain is witnessed by the growing number of papers proposing algorithms for the analysis of IIF images. Thus, an important issue regards the definition of reliable classification algorithms and the comparison of their performance on common datasets.

The competition continued the experience of two previous benchmarking activities held at the [ICPR 2012](#) and [ICIP 2013](#). Both previous initiatives were focused on the classification of cells belonging to HEp-2 images according to a predefined set of classes. The initiative held on August 24, 2014, in Stockholm while on one side reproposed the same task in order to monitor the advances of the research with respect to this specific problem, on the other side invited the scientific community to face the

new and more challenging pattern recognition problem related to classification at specimen level.

The competition received more than 100 registrations with 18 submissions from around the world, confirming the high interest with respect to this research area.

The “Performance Evaluation of Indirect Immunofluorescence Image Analysis Systems” was jointly organized by the University of Salerno (Italy) and the University of Queensland (Australia) with the support of the Sullivan Nicolaides Pathology (SNP) – Queensland Medical Testing Laboratory, (Australia). The involvement of the SNP, a relevant laboratory that offers high qualified pathology services for doctors, private hospitals and nursing homes in Queensland northern New South Wales and Darwin, allowed access to significant and valuable

datasets that were not only used for the contest, but are made publicly available to the scientific community.

Winner

Congratulations to the winner of Task 1 and Task 2:

S. Manivannan, W. Li, S. Akbar, R. Wang, J. Zhang, S. J. McKenna, University of Dundee, UK

The contest report can be accessed from http://i3a2014.unisa.it/?page_id=523



Photo by Kristína Lidayová and Tomáš Oravec

Shazia Akbar accepted the award for the team from the University of Dundee, UK. She is shown here with workshop and contest organizers, Mario Vento and Brian Lovell.

Unsupervised Image Segmentation

<http://mosaic.utia.cas.cz/icpr2014/>

An ICPR 2014 Contest, August 24, 2014, Stockholm, Sweden

Contest Organizers:

Michal Haindl (Czech Republic)

Stanislav Mikeš (Czech Republic)

Contest co-organizer Michal Haindl is co-author of one of the [Free Books](#) available for review.

~Zeeshan Zia, Assoc. Ed. for Book Reviews

by the Contest Organizers

In order to promote the evaluation of unsupervised colour image segmentation algorithms using publicly available data sets, standard performance assessment methodology and online web verification server and database ([The Prague Texture Segmentation Data Generator and Benchmark](#)), we organized a competition for the best segmentation algorithms, the [Unsupervised Image Segmentation Contest](#), in conjunction with [ICPR 2014](#).

Although numerous different methods were already published, the ill-defined image segmentation problem is still far from being solved. In addition to that, very little is known about the properties and behaviour of already published segmentation methods and their potential user is left to randomly select one due to absence of any reliable counselling. The contest aimed to overcome these problems by suggesting the most promising approaches to unsupervised learning and image segmentation and to unify the verification methodology used in the image segmentation research.

The benchmark [contest data set](#) were 80 computer generated 512×512 random mosaics filled with randomly selected difficult

natural colour textures. The contest criterion was the average rank over 21 [benchmark criteria](#), which can be categorized into four groups: region-based (5), pixel-wise (11), consistency measures (2), and clustering comparison criteria (3). These performance criteria mutually compared ground truth image regions with the corresponding machine segmented regions. The number of regions in every mosaic was required to be identified by the method and no user interaction was allowed. Any number of results could be uploaded until the final deadline of June 13, 2014, but every group could see only their own results from which the best was considered. The competing methods were finally verified by the organizers using submitted code and another alternative 80 test texture mosaics.

Fifteen contestants had registered, but only six of them submitted their segmentation results, and one of them deleted his results before the end of the contest. This lower turnout was probably due to the difficulty of the contest, because numerous people anonymously downloaded the contest data for the trial. The preliminary contest results (corresponding to the deadline for preliminary results, December 13, 2013) were published in the ICPR paper [1]. The [final results](#) and the benchmarking methodology were presented in the [Unsupervised](#)

[Image Segmentation Workshop](#) at ICPR 2014 to which 37 participants from 15 countries had registered.

The contest winner was the method **Texture Segmentation Based on Voting of Blocks, Bayesian Flooding and Region Merging** by authors Costas Panagiotakis, Ilias Grinias and Georgios Tziritas from the Technological Educational Institute of Crete, Greece. The authors of the winning algorithm received a prize presented at the



workshop – an engraved Bohemia crystal mug with Pilsner Urquell beer to toast their success. The performance of all submitted algorithms was summarised in the presentations given at the contest workshop, and the workshop concluded with a round table discussion about the unsupervised segmentation progress and optimal benchmarking for unsupervised segmenters.

[1] M. Haindl and S. Mikeš, "Unsupervised Image Segmentation Contest," in Proc. ICPR 2014, pp. 1484 – 1489.

[2] <http://mosaic.utia.cas.cz> Prague Texture Segmentation Data Generator and Benchmark



Santanu Chaudhury (India)

For contributions to the field of image analysis and recognition

David Doermann (USA)

For contributions to the field of document image analysis and in recognition of service to the IAPR

Mohamed Doudi (France)

For contributions to 3D shape analysis and retrieval and related applications

Marco Gori (Italy)

For contributions to neural networks and machine learning models for pattern recognition

Xiaofei He (China)

For contributions to pattern recognition and manifold learning

De-Shuang Huang (China)

For contributions to neural networks and biological data processing

Umapada Pal (India)

For contributions to Indian multi-script document processing and handwriting recognition and for service to the IAPR

Sharathchandra Pankanti (USA)

For contributions to the application of computer vision and pattern recognition technologies to video analytics, public safety and security

Andrea Prati (Italy)

For contributions to low- and high-level algorithms for video surveillance

Anuj Srivastava (USA)

For contributions to statistical techniques on nonlinear manifolds for applications in pattern recognition, and to shape analysis of curves and surfaces

Jie Tian (China)

For contributions to fingerprint recognition and medical imaging

Matthew Turk (USA)

For contributions to computer vision and vision-based interaction

Liang Wang (UK)

For contributions to video understanding and pattern recognition

Changsheng Xu (China)

For contributions to multimedia content analysis

Shuicheng Yan (Singapore)

For contributions to computer vision and pattern recognition

ICPR 2014 Highlights



Best Industry Related Paper Award

presented to

Sangmin Oh, Megha Pandey, Ilseo Kim, Anthony Hoogs, and Jeff Baumes

for the 22nd ICPR Paper

"Personalized Economy of Images in Social Forums: An Analysis on Supply, Consumption, and Saliency"



Anthony Hoog accepts the award from IAPR President Kim Boyer.



Avinash Kumar accepts the award from IAPR President Kim Boyer.

Piero Zamperoni Best Student Paper Award

presented to

Avinash Kumar

for the 22nd ICPR Paper

"Generalized Radial Alignment Constraint for Camera Calibration"

authors: Avinash Kumar and Narendra Ahuja

NOTE:

Avinash Kumar is the author of the [IAPR...The Next Generation](#) column in this issue of the IAPR newsletter.

~A. Kuijper, EiC, IAPR Newsletter

Photos by Kristína Lidayová and Tomáš Oravec.

A link to the Photo Gallery for the conference can be found [here](#).

IBM Best Student Paper Awards

Track 1: Computer Vision

Peihao Huang

"Deep Embedding Network for Clustering"

authors: Peihao Huang, Yan Huang, Wei Wang and Liang Wang

Track 2: Pattern Recognition and Machine Learning

Ziad Al-Halah

"What to Transfer? High-Level Semantics in Transfer Metric Learning for Action Similarity"

authors: Ziad Al-Halah, Lukas Rybok and Rainer Stiefelwagen

Track 3: Speech, Signal and Video Processing

Çağlar Aytekin

"Automatic Object Segmentation by Quantum Cuts"

authors: Çağlar Aytekin, Serkan Kiranyaz and Gabbouj Moncef

Track 4: Document Analysis, Biometrics and Pattern Recognition Applications

Yan Yan

"Clustered Multi-Task Linear Discriminant Analysis for View Invariant Color-Depth Action Recognition"

authors: Yan Yan, Elisa Ricci, Gaowen Liu, Ramanathan Subramanian and Nicu Sebe

Track 5: Biomedical Image Analysis

Asongu L. Tambo

"Integrated Model for Understanding Pollen Tube Growth in Video"

authors: Asongu L. Tambo, Bir Bhanu, Nan Luo, Geoffrey Harlow and Zhenbiao Yang

Best Scientific Paper Awards

Track 1: Computer Vision

Che-Han Chang, Chiu-Ju Chen and Yung-Yu Chuang

"Spatially-Varying Image Warps for Scene Alignment"

Track 2: Pattern Recognition and Machine Learning

Fillipe Dias Moreira de Souza, Sudeep Sarkar, Anuj Srivastava and Jingyong Su

"Pattern Theory-Based Interpretation of Activities"

Track 3: Speech, Signal and Video Processing

Antonis Ioannidis, Vasileios Chasanis and Aristidis Likas

"Key-Frame Extraction Using Weighted Multi-View Convex Mixture Models and Spectral Clustering"

Track 4: Document Analysis, Biometrics and Pattern Recognition Applications

Hossein Rahmani, Arif Mahmood, Du Huynh and Ajmal Saeed Mian

"Action Classification with Locality-Constrained Linear Coding"

Track 5: Biomedical Image Analysis

Nicolas Lermé, Florence Rossant, Isabelle Bloch, Michel Paques and Edouard Koch

"Segmentation of Retinal Arteries in Adaptive Optics Images"

The 2014 Meeting of the IAPR Governing Board

Traditionally, on the Tuesday of ICPR, a formal meeting of the IAPR Governing Board takes place.

Some of the key outcomes of the 2014 Governing Board meeting are listed below. Please check the [IAPR website](#) and future issues of the [IAPR Newsletter](#) for more information as it becomes available.

- Two new member societies from Malaysia and Tunisia were admitted into the IAPR.
- A new Technical Committee on Pattern Recognition in Human-Machine Interaction was approved.
- The Maria Petrou Prize, a third major IAPR prize to be awarded at future ICPRs, was approved.
- An IAPR Research Scholarship program was approved.
- Beijing, China, was selected to host ICPR 2018.
- A new Executive Committee was elected.



The IAPR Executive Committee for the 2014-2016 term:
President Ingela Nyström, Past President Kim Boyer, Secretary Alexandra Branzan-Albu,
1st Vice President Massimo Tistarelli, Treasurer Apostolos Antonacopoulos and
2nd Vice President Simone Marinai

Photo by Kristína Lidayová and Tomáš Oravec

BOOKSBOOKSBOOKS

FREE BOOKS

The *IAPR Newsletter* is looking for reviewers for the books listed below. If you have interest and some knowledge in the topic, email us with your mailing address. We will send you a copy of the book—which you may keep—and will expect in return a review for the Newsletter. ~[Zeeshan Zia](#), Associate Editor for Book Reviews15

* ***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>

* ***Scalable Pattern Recognition Algorithms*** by Pradipta Maji and Sushmita Paul (ISBN 978-3-319-05629-6): <http://www.springer.com/computer/bioinformatics/book/978-3-319-05629-6>

* ***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>

* ***Unsupervised Process Monitoring and Fault Diagnosis with Machine Learning Methods*** by Chris Aldrich and Lidia Auret (ISBN 978-1-4471-5184-5): <http://www.springer.com/computer/ai/book/978-1-4471-5184-5>

* ***Visual Texture*** by Michal Haindl and Jiri Filip (ISBN 978-1-4471-4901-9): <http://www.springer.com/computer/image+processing/book/978-1-4471-4901-9>

* ***Imaging Spectroscopy for Scene Analysis*** by Antonio Robles-Kelly and Cong Phuoc Huynh (ISBN 978-1-4471-4651-3): <http://www.springer.com/computer/image+processing/book/978-1-4471-4651-3>

* ***Motion History Images for Action Recognition and Understanding*** by Md. Atiqur Rahman Ahad (ISBN 978-1-4471-4729-9): <http://www.springer.com/computer/image+processing/book/978-1-4471-4729-9>

* ***Introduction to Image Processing Using R*** by Alejandro C. Frery and Talita Perciano (ISBN 978-1-4471-4949-1): <http://www.springer.com/computer/image+processing/book/978-1-4471-4949-1>

* ***Time-of-Flight Cameras*** by Miles Hansard, Seungkyu Lee, Ouk Choi, and Radu Horaud (ISBN 978-1-4471-4657-5): <http://link.springer.com/book/10.1007%2F978-1-4471-4658-2>

* ***Real-Time Detection of Lines and Grids*** by Adam Herout, Markéta Dubská and Jiří Havel (ISBN 978-1-4471-4413-7): <http://link.springer.com/book/10.1007%2F978-1-4471-4414-4>

* ***Omnidirectional Vision Systems*** by Luis Puig and J.J. Guerrero (ISBN 978-1-4471-4946-0): <http://link.springer.com/book/10.1007%2F978-1-4471-4947-7>

* ***Annual Dynamics of Daylight Variability and Contrast*** by Siobhan Rockcastle and Marilyne Andersen (ISBN 978-1-4471-5232-3): <http://www.springer.com/computer/theoretical+computer+science/book/978-1-4471-5232-3>

* ***Efficient Algorithms for Discrete Wavelet Transform*** by K. K. Shukla and Arvind K. Tiwari (ISBN 978-1-4471-4940-8): <http://link.springer.com/book/10.1007%2F978-1-4471-4941-5>

* ***Graph-Based Clustering and Data Visualization Algorithms*** by Agnes Vathy-Fogarassy and Janos Abonyi (ISBN 978-1-4471-5157-9): <http://www.springer.com/computer/database+management+%26+information+retrieval/book/978-1-4471-5157-9>



This bulletin board
contains items of interest to the
IAPR Community

Call for Membership IAPR Industrial Affiliation Program

Do you represent a company that provides products or services related to pattern recognition, computer vision or image processing in a broad sense?

Then consider becoming an IAPR Industrial Affiliate. The affiliation is free of charge and has the following benefits:

- *IAPR Newsletter* subscription.
- Display of company logo and url at IAPR web site.
- Publicity in an IAPR-ILC kiosk / leaflet during ICPR.
- Access (through IAPR-ILC) to the IAPR-endorsed conferences and workshops to define sponsorship programs for the conferences, awards, etc.
- Special notification of industry related events (e.g., special panel session on industry related research)

Interested in joining the IAPR Industrial Affiliation Program or in receiving more information?

Contact:
The IAPR Industrial Liaison Committee Chair
c/o Jianying Hu
jyhu@us.ibm.com
or
The IAPR Secretariat
c/o Linda J. O'Gorman
secretariat@iapr.org

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FREE BOOKS!!!

Suggestions for the IAPR?

Comments and suggestions can be
sent to the IAPR via
the Office of the Secretariat:
Linda O'Gorman
secretariat@iapr.org



Meeting and Education Planner

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

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

* Asterisks denote non-IAPR events *

2014		Meeting	Report	Location
	NOV	CIARP 2014 : 19th Iberoamerican Congress on Pattern Recognition	CIARP 2013	México

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
		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
	SEP	ICIAP 2015 : 18th International Conference on Image Analysis and Processing	ICIAP 2013	Italy
		ICDAR 2015 : 13th International Conference on Document Analysis and Recognition	ICDAR 2013	Tunisia
	NOV	ACPR 2015 : 3rd Asian Conference on Pattern Recognition	ACPR 2013	Malaysia
PSIVT15 : 7th Pacific Rim Symposium on Image and Video Technology		PSIVT13	New Zealand	

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