

IAPR

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Newsletter

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From the Editor's Desk: Review before Research

by Jing Dong

jdong@nlpr.ia.ac.cn

<http://cripac.ia.ac.cn/en/EN/column/item113.shtml>

In 2014 and 2015, the "From the Editor's Desk" column of this *Newsletter* discussed various aspects of getting papers accepted to worthwhile publications. These suggestions focused on early-career researchers. With this column, I'd like to take a step back and talk about selecting new research topics. When you're new to a field, it almost feels like your doing an "internship". How can you make your internship shorter and move forward on your research career?

It is not easy to select a good research topic when you are still fresh in the field. Reading good review/survey papers is a good choice before making up your mind. Since the research review is both a summary and an evaluation of state-of-art work in a particular research area, it typically provides more information than a single paper and enables you to better understand an algorithm or a technical report for an application.

The review papers you choose to read will be guided by what you think research objective might be or by the issues or theses that interest you. Often, in this way, you will even get the framework of your future work.

So, how do you select good survey papers from the thousands of available papers? The search can start with the expert reviewers in your field of study. These experts are often asked to review the work of other professionals, and they understand the main points and arguments of the area, hence their (review) papers will contain meaningful information and evaluations.

Then, how to define the experts? Aha, that would be a very easy task: search the main societies, conferences, journals, workshops in the field, those leading people in the Technical Program Committees will be your target!

And now, if you happen to identify a topic in pattern recognition or a related field for your next paper, please pay attention to the *IAPR Newsletter*. Our *Newsletter's* regular features are a good medium to explore your research

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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/

2019

[IbPRIA 2019](#)

9th Iberian Conference on
Pattern Recognition and Image Analysis
Madrid, Spain
Deadline: Apr. 30, 2019
Dates: Jul. 1-4, 2019

[ISAIR 2019](#)

4th International Symposium on
Artificial Intelligence and Robotics 2019
Daegu, Korea
Deadline: Apr. 30, 2019
Dates: Aug. 20-24, 2019

[PReMI 2019](#)

8th International Conference on
Pattern Recognition and Machine Intelligence
Tezpur, India
Deadline: May 6, 2019
Dates: Dec. 17-20, 2019

[ICIAP 2019](#)

20th International Conference on
Image Analysis and Processing
Trento, Italy
Deadline: May 6, 2019
Dates: Sep. 9-13, 2019

[ICIG 2019](#)

10th International Conference on
Images and Graphics
Beijing, China
Deadline: May 10, 2019
Dates: Aug. 23-25, 2019

[CVIP 2019](#)

Fourth International Conference on
Computer Vision and Image Processing
Jaipur, India
Deadline: May 15, 2019
Dates: Sep. 27-29, 2019

[CIARP 2019](#)

24th Iberoamerican Congress on Pattern Recognition
Havana, Cuba
Deadline: May 18, 2019
Dates: Oct. 28-31, 2019

[GREC 2019](#) (with ICDAR 2019)

20th International Conference on
Image Analysis and Processing
Sydney, Australia
Deadline: May 20, 2019
Dates: Sep. 20-21, 2019

[HIP 2019](#) (with ICDAR 2019)

5th International Workshop on
Historical Document Imaging and Processing
Sydney, Australia
Deadline: Jun. 1, 2019
Dates: Sep. 20-21, 2019

[ICDAR-OST 2019](#) (with ICDAR 2019)

2nd International Workshop on
Open Services and Tools for Document Analysis
Sydney, Australia
Deadline: June 1, 2019
Dates: Sep. 21, 2019

[MedPRAI 2019](#)

3rd Mediterranean Conference on
Pattern Recognition and Artificial Intelligence
Istanbul, Turkey
Deadline: Jun. 14, 2019
Dates: Dec. 22-24, 2019

[PSIVT 2019](#)

9th Pacific-Rim Symposium on
Image and Video Technology
Sydney, Australia
Deadline: July 15, 2019
Dates: 18-22 November, 2019

[ACPR 2019](#)

5th Asian Conference on Pattern Recognition
Auckland, New Zealand
Deadline: Aug. 1, 2019
Dates: Nov. 26-29, 2019

2020

[ICFHR 2020](#)

17th International Conference on
Frontiers in Handwriting Recognition
Dortmund, Germany
Deadline: TBD
Dates: Sep. 8-10, 2020

[ICPR 2020](#)

25th International Conference on
Pattern Recognition
Milan, Italy
Deadline: TBD
Dates: Sep. 13-18, 2020

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interest. In this issue's [book review](#), you can think about *Deep Learning and Convolutional Neural Networks in Medical Image Computing*. This issue's [IAPR Fellow feature](#) is from Arun Ross, an area expert in biometrics. And the regularly published [TC News section](#) will introduce you to more area experts (this issue's ["From the ExCo" column](#) also spotlights TCs). You can consider [Benchmark Datasets](#)

for your experiments, and then plan the timeline for submitting your paper from the CfPs (above on this page)!

What a nice one-stop service for our community!!

At the end, please also do me a favor, after your reading, could you please send your views to me? (jdong@nlpr.ia.ac.cn). Your "review" really accounts!

Please send
your thoughts and ideas about
the IAPR Newsletter to me,
Jing Dong, jdong@nlpr.ia.ac.cn



GET READY FOR...



Organizing Team:

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Javier Ruiz-del-Solar (Univ. of Chile, Chile)

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Elisa Ricci (Univ. of Trento, Italy),

Kyong Mu Lee (Seoul National Univ., Korea),

Changsheng Xu (Chinese Academy of Sciences, China)

Image and Signal Processing

Sebastiano Battiato (Univ. of Catania Italy),

Andrea Cavallaro (Queen Mary Univ. of London, UK)

Calls from IAPR Committees

From the IAPR Education Committee:

Call for Applications for IAPR Research Scholarships

<https://iapr.org/docs/IAPR-EC-RS-Call-2018.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 and duration: The scholarship covers round trip travel & basic living expenses for a visit of less than 12 months.

Requirements: The candidate must be a full-time researcher with between one and eight years experience. The candidate must also be a member of an IAPR member society. See [Call for Applications](#) for a full list of requirements.

Contact information:

IAPR Secretariat

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

From the IAPR Industrial Liaison Committee:

Call for Internship Listings for the IAPR Internship Brokerage Page for Companies with internships available and for Students seeking internship opportunities

<http://homepages.inf.ed.ac.uk/rbf/IAPR/INDUSTRIAL/>

Description: The IAPR-ILC wishes to promote opportunities for students to undertake internships at companies working in Pattern Recognition, AI, Computer Vision, Data Mining, Machine Learning, etc. We propose to do this by having a web-based internship listing service. Companies can list their internship opportunities; students can browse the listings and contact the company.

For companies with internships to list: For students:

(see examples at the URL above)

If you are a student, please visit the web site listed above.

Please email your listings as follows:

To: Bob Fisher - rbf@inf.ed.ac.uk

Subject: IAPR internship listing

Details:

- Host:
- Location:
- Post Type:
- Specialty:
- Funded:
- Length:
- Degree & Visa Requirements:
- Internship start date:
- Application closing date:
- Details:
- Contact:

NOTE: At the time of publication, there were 28 opportunities listed and over 6400 views.

Contact Information:

Bob Fisher, rbf@inf.ed.ac.uk
Chair, IAPR-ILC

From the IAPR

Executive Committee (ExCo):

Call for Proposals for "Summer" Schools

<https://iapr.org/committees/SummerSchool-2018.pdf>

Deadline schedule:

Deadline:

February 1st

June 1st

October 1st

School dates:

April-July

August-November

December-March

"Summer" schools are training activities that expose participants to the latest trends and techniques in the particular pattern recognition field. ("Summer" is used generically; the school can take place in any season.)

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.

How to Submit: Proposals for IAPR funded summer schools should be submitted to IAPR Secretariat Linda O'Gorman by email (secretariat@iapr.org). A PDF attachment containing all the required information is appreciated.

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

An Interview with Arun Ross, IAPR Fellow



*Arun Ross, IAPR Fellow
ICPR 2018, Beijing*

For contributions that significantly advance biometric technologies; extend considerably its infrastructure; and enable its continuing scientific advances

Arun Ross is a Professor in the Department of Computer Science and Engineering at Michigan State University (MSU) and the Director of the i-PRoBe Lab. Prior to joining MSU in 2013, he was a faculty member at West Virginia University (WVU) from 2003 to 2012. He also served as the Assistant Site Director of the NSF Center for Identification Technology and Research (CITeR) between 2010 and 2012. He is the coauthor of the textbook "Introduction to Biometrics" and the monograph "Handbook of Multibiometrics," and the co-editor of "Handbook of Biometrics". He is a recipient of the IAPR JK Aggarwal Prize, the IAPR Young Biometrics Investigator Award (YBIA) and the NSF CAREER Award. He was designated

continued on [next page...](#)

Editor's note:

IAPR Fellowship is the third high honor the IAPR has given to Prof. Ross. In 2013, he received the inaugural IAPR TC4 Young Biometrics Investigator Award, and in 2014, the J.K. Aggarwal Prize ("For contributions that advance the state of art in biometric technologies and extend biometric infrastructure.")

For this essay, the IAPR Newsletter invited him to touch on the following questions.

- Can you tell us your opinion on the future of biometrics? What is your dream for the next 10 years in research? And what do you think are the most challenging problems you are facing at this moment?*
- Your personal research experience and success have already made you a role model for students as well as young professionals in biometrics, what's your personal advice to youth? In research as well as in life?*

~ Jing Dong, IAPR Newsletter EiC

Can you tell us your opinion on the future of biometrics? What is your dream for the next 10 years in research? And what do you think are the most challenging problems you are facing at this moment?

A growing number of applications require the use of an effective mechanism for automatically recognizing individuals. These applications range from personal smartphones to border security; from autonomous vehicles to e-voting; from tracking child vaccinations to preventing human trafficking; from assisting law enforcement to delivering personalized services; etc. In all these domains, where person recognition is critical, biometrics will inevitably play a significant role in the future.

Having said that, there are a number of unsolved challenges in biometrics.

1. Biometric recognition is based on two central principles: distinctiveness and persistence of the biometric trait of an individual. "Distinctiveness" ensures that two or more individuals do not share the same biometric trait. "Persistence" ensures that an individual can be successfully recognized using a certain biometric trait after a large lapse of time. Surprisingly, our knowledge about the distinctiveness and persistence of even the four most extensively studied biometric traits (fingerprint, face, iris and voice) is incomplete and

often relegated to anecdotal interpretation of error rates rather than a systematic exploration of the biology of the trait. This remains an unsolved problem for almost every biometric trait, although some progress has been recently made in this regard.

2. Devising biometric systems that can operate in unconstrained sensing environments is another unsolved problem. Almost every biometric system either implicitly or explicitly imposes some type of constraint on the user or the environment during data acquisition. As an example, an iris recognition system might expect the user to position their face in a certain way with respect to the camera; similarly, a speaker recognition system might require the environment to be reasonably quiet. For “ubiquitous biometric recognition” to gain traction, such constraints have to be surmounted in order to seamlessly recognize individuals, i.e., the interaction between an individual and a biometric system should be transparent. This would necessitate the design of novel sensors, innovative human computer interfaces and robust data processing algorithms.

3. With the advent of “DeepFakes” and “Spoof Attacks” – where synthetically generated traits or maliciously modified traits are used to circumvent the system – it is necessary to develop mechanisms that can deflect or detect such adversarial attacks. The challenge is to develop counter-measures that are applicable to hitherto unseen or unknown attacks, i.e., those attacks that are yet to be conceived of, but which the system will encounter in

the future. This is a formidable challenge that can evolve into a “cat-and-mouse” game between the adversary and the system designer.

4. Biometric systems, especially those based on face recognition, have exhibited demographic bias in which certain population groups have experienced significantly higher error rates than others. For example, face detection methods have been observed to fail more often on subjects with darker skin-tone than those with lighter skin-tone. While such biases could be attributed to the lack of sufficiently diverse training data, it nevertheless brings into question the fairness and integrity of AI-based systems in general. Indeed, data-driven approaches seem to be vulnerable to such biases and it remains to be seen how this can be mitigated in the context of biometric systems that are increasingly being deployed in heterogeneous populations worldwide.

5. Modern machine learning algorithms are capable of extracting additional information - such as age, gender, race and health cues - from a person’s biometric data. This has brought to the fore the privacy of an individual whose biometric data is collected for a certain purpose (e.g., accessing a building) but misused for a different purpose (e.g., gender profiling). Given the recent enforcement of data privacy regulations such as EU GDPR, it is imperative that privacy is accorded to biometric templates by preventing additional information from being extracted. Designing secure and privacy-preserving templates, that (nonetheless) result in high recognition accuracy, can be a

daunting task in many consumer applications.

Your personal research experience and success have already made you a role model for students as well as young professionals in biometrics, what’s your personal advice to youth? In research as well as in life?

One should have a passion for conducting research – to be excited about investigating difficult problems in a systematic and persistent manner. In a field such as biometrics, it is also important to identify the right problem to work on – otherwise one’s work can be lost in obscurity. Indeed, conducting the right research at the right time and publishing it in the right venue is important! Biometrics is a fascinating pattern recognition problem, and we are fortunate to be working in a field that has direct societal benefits.

Thinking “out-of-the-box” often leads to innovative research. However, to do so, one must be aware of what the “box” is! This would entail becoming familiar

*...continued from [previous page](#)
a Kavli Fellow by the US National Academy of Sciences by virtue of his presentation at the 2006 Kavli Frontiers of Science Symposia. Arun served as a panelist at a counter-terrorism event that was organized by the United Nations Counter-Terrorism Committee (CTC) at the UN Headquarters in May 2013. He currently serves as Associate Editor of IEEE Transactions on Circuits and Systems for Video Technology, Senior Area Editor of IEEE Transactions on Image Processing, Area Editor of the Computer Vision and Image Understanding Journal, Associate Editor of the Image and Vision Computing Journal, and Advisor to the IAPR TC4 on Biometrics.*

with related scientific literature and conversing with researchers who are considered to be leaders in the field. Discussions with experts in the biometric industry often provide insights into real-world operational challenges encountered by a deployed system.

Knowing how to effectively defend and communicate one's research findings is a necessary

trait. A good research article not only explores an interesting and relevant problem, but also provides adequate justification for the proposed approach. Research articles must exhibit clear-thinking on the part of the researchers and present a logical flow of ideas.

At the same time, life is more than just research work! "For everything there is a season, and a time for

every matter under heaven". It is good to occasionally take a break and do some things outside the lab. Spending time with one's family and friends is always inspiring and refreshing. Yes, research activities do become an integral part of a scientist's life, but they must be balanced with other aspects of life also!

IAPR Then and Now...2014 J. K. Aggarwal Prize

IAPR Newsletter (ICPR 2014 Special Issue), Volume 36 Number 4, October 2014



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

"For contributions that advance 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.

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?*
- *In more detail: What technical work have you done, and what is/are your current research interest(s)?*
- *And lastly: How can the IAPR help young researchers?*

~Jing Dong, Editor -in-Chief

Praneeth Susarla



I am a 2nd year PhD student in the Centre for Machine Vision and Signal Analysis(CMVS) Research Unit of Information Technology and Electrical Engineering (ITEE) Department at the University of Oulu.

My current research emphasis is on developing distributed machine learning algorithms for domain specific architectures like Internet of Things (IoT) and Multiple Inputs Multiple Outputs (MIMO) antenna units. In particular, I am working on a radio beamforming application and its implementation at two different architectures (low energy IoT and high energy RF) on sensor level.

I received my Integrated Masters (Bachelors in Information Technology and Masters in Embedded Systems) at the International Institute of Information Technology Bangalore, India, in 2017. Apart from Embedded Systems, Computer Vision is one other major area, where I gained exposure during my Integrated Masters. I pursued my Master's thesis by research in Computer Vision, working on an Indoor Video Surveillance application.

Editor's note:

Praneeth Susarla won the IAPR Best Student Paper Award at MedPRAI 2018 for the paper titled "Human Weapon-Activity detection in Surveillance Videos using Structural RNN". You can read the report on this IAPR-endorsed event in the January 2019 issue of the IAPR Newsletter [\[41:1\]](#).

~ Jing Dong, IAPR Newsletter EiC

by Praneeth Susarla, University of Oulu, Finland

How did you get involved in pattern recognition?

In the 2nd half of my third year in Integrated Masters, I was taking this course called Digital Image Processing under Prof. Dinesh Babu Jayagopi. That was the first time I explored this new area that deals with images and videos.

I was asked to implement a paper titled, "Visual Categorization using Bag of Keypoints" from Xerox Research Center Europe. During its implementation, I was fascinated by the way the math behind this method resulted in categorizing different sets of images. And, the good results in the end excited me and made me curious to explore more in this area. I then continued my studies in computer vision and pattern recognition for nearly

3.5 years (until the end of my Integrated Masters). Along with embedded systems, I worked on different interesting projects like face recognition, age recognition, indoor surveillance, ear detection etc., finishing my Master's thesis in this area.

What technical work have you done, and what is/are your current research interest(s)?

Besides, being a computer science student learning different programming languages and operating systems, I was more of an electronics enthusiast around that time, working with different micro-controllers. I wanted to explore other areas involving hardware in addition to my exposure to the field of computer vision. I got curious about the field of embedded computer vision but wanted to work more on the architecture level rather than the ASIC level. Interestingly, I found this opportunity through machine vision. This field involves a generic sensor-related research unlike camera-only sensors, at the hardware and signal processing level.

I am currently pursuing my PhD research in this field of machine vision where my interest lies in optimizing machine learning algorithms at the software level with respect to hardware architectures. Its more about achieving efficient an hardware-software interface by optimizing the software in accordance with the underlying hardware architecture and vice versa.

My current research is in developing distributed machine learning algorithms for domain specific architectures like Internet of Things (IoT) and Multiple Inputs Multiple Outputs (MIMO) antenna units. Currently, these kinds of problems are of more interest to radio technologists, especially

in the 5G and 6G network communities. Hence, I chose the beamforming application in radio communications as my software application and am working on this problem.

There has been a tremendous increase in interest towards automation in radio communications, especially in the coming era of 5G and 6G networks. With the need to increase the data rates, more antennas are now being embedded into radio units, making the system increasingly complex. Coordinating each antenna with one another and directing the beams in different directions accordingly with huge path losses is no more a traditional beamforming problem. With machine learning becoming more popular these days as an automation tool, the idea is to use it in radio communications as well and see if complex beamforming capabilities of these radio units be handled in any efficient manner.

I am working on developing a distributed learning algorithm for a beamforming application with respect to low power IoT under Prof. Olli Silven and high power radio frequency MIMO antenna units under Prof. Markku Juntti. My final aim is to analyse the importance of architecture for machine learning related software applications like beamforming to see if I can make any general comments about them.

How can the IAPR help young researchers?

First and foremost, I personally think the students from Bachelors and Masters level programs should be encouraged to do research and publish papers. Traditionally, "researchers" usually means PhD students, but I think that the awareness of technologies in the field of computer science has grown so much that, even at the

Masters level, people are finding a really good scope to do some quality research.

Encouragement from organizations like IAPR through scholarships for attending conferences or publishing papers helps not only in increasing the exposure towards Pattern Recognition and Machine learning but also might provide younger researchers with much needed motivation to continue towards doctoral studies later.

We always witness two different kinds of research namely, industrial based research and academia or theoretical based research. Even in the fields of pattern recognition and machine learning, as far as I am aware of, academia currently involves working more towards application based research. I believe that both theoretical and industrial based research have to go hand-in-hand for progress to be achieved in the research community, and organizations like the IAPR can play a crucial role in bridging the gap between them.

Most of the conferences organized under the IAPR are not just academic-based but industry-curious as well. So, if the IAPR can expand on this to help young researchers collaborate with industry and enhance their work further to industrial standards, it could really help them gain industrial exposure and grow their careers in future.



From the



IAPR ExCo on...

IAPR Technical Committees

by [Alexandra Branzan Albu](#) (Canada)
IAPR 1st Vice-President



President's note:

We've changed the format of this page so that we're sharing more insight into the workings of the IAPR. Now, in addition to specific "news items" from the ExCo, you'll be able to learn more about the various IAPR Committees from the ExCo liaisons to those committees.

~ Apostolos Antonacopoulos, IAPR President

News from the IAPR Executive Committee

- Can you help? The ExCo is beginning a project to digitize proceedings from ICPRs and other IAPR conferences that are not otherwise available in a digital library. Do you have digitized copies of pre-1988 proceedings? Printed copies? Please email secretariat@iapr.org.
- **ICPR 2020** will be here before you know it! Please follow the latest information at the ICPR 2020 website, <https://iapr.org/icpr2020>
- Calls for Nominations for the prizes to be presented at ICPR 2020 ([K. S. Fu Prize](#), [J. K. Aggarwal Prize](#), [Maria Petrou Prize](#), [IAPR Fellow Awards](#)) will be sent out in the coming months. The Calls will be announced through the [IAPR website](#) and *Newsletter* (subscribe here <https://iapr.org/mail/>, if you haven't already) or check the News page regularly <https://iapr.org/news/>.

As 1st Vice-President of the IAPR, I am the ExCo liaison to the sixteen IAPR Technical Committees (TCs). This column is organized around four questions that explain the role of TCs within the IAPR structure and their past, present, and future.

1. What is the role of TCs within the IAPR?

On its surface, the IAPR is an association of scientific organizations from around the world, yet within that structure, there are three distinct layers.

- Its **geographical layer** consists of national societies that contribute to the governance of the IAPR via their representation on the IAPR's Governing Board.
- Its **operational layer** is represented by several Standing Committees that are designed to fulfill specific roles essential to the mission of the IAPR.
- The TCs represent the **research layer** and thus, in my opinion, the backbone of the IAPR, since they are responsible for advancing the state-of-the-art in specific research areas related to pattern recognition. TCs encourage international collaborations among IAPR members belonging to various national societies, and they serve communities that are defined by common technical and research interests.

2. How did the IAPR's TCs come into being?

TCs were proposed by Professor Herbert Freeman and approved at the meetings held during ICPR 1982 in Munich [[IAPR Newsletter 5:4](#)]. Initially, the newly formed IAPR TCs followed the model of their counterparts from IFIP (International Federation of Information Processing), as the IAPR was an affiliate member at that time.

Ten TCs were initially proposed. There were some name changes, two additional TCs added to the list, and eight up and running by April 1984 [[IAPR Newsletter 7:2](#)] when IAPR President J. C. Simon outlined their three underlying principles:

"1) [to] give a more permanent activity to IAPR, outside the [biennial] international conference ICPR;

2) [to] promote new meetings, conferences, newsletter, teaching activities, sponsored by IAPR;

3) [to] diversify our efforts in fields where other active organizations enter in competition for Pattern Recognition activities.”

It is interesting to note that, by 1984, eight of the twelve initially planned TCs came alive.

3. What is the current status of the IAPR TCs?

While TCs were formed as an initiative of the governance of the IAPR, they are independently governed, dynamic entities.

All TCs need to follow a set of bylaws, which were designed to ensure that the committees are geographically diverse and that their dynamic essence is preserved by regular changes in their leadership.

The TCs are expected to act as a point of reference for their topics and to build a community around them.

Limited funding is available for supporting certain initiatives of TCs, such as creation and maintenance of educational materials, public datasets, web sites etc. Interested TCs may contact the ExCo for more details.

4. What does the future of IAPR TCs look like?

It is highly desirable that TCs play a more central role in our biennial ICPR conference, for instance by becoming involved in the selection of the Track and Area Chairs, by organizing satellite workshops, etc. This way, the ICPR events would truly represent leading edge research that is conducted in highly active research domains related to pattern recognition.

The IAPR ExCo also encourages research communities in areas of data science, visual analytics and health analytics to propose new TCs.

IAPR Then and Now... Technical Committees (TCs)

List of TCs (10 originally proposed + 2 additional) in April 1984 and Current List in April 2019

TC1 Statistical Pattern Recognition (proposed)	TC1 Statistical Pattern Recognition Techniques (Chair: Battista Biggio, Univ. of Cagliari, Italy)	TC10 Graphics Recognition (Chair: Alicia Fornes, Univ. of Barcelona, Spain)
TC2 Syntactical Pattern Recognition Techniques (Founding Chair: H. Bunke, Univ. of Erlangen, Germany)	TC2 Structural & Syntactical Pattern Recognition (Chair: Antonio Robles-Kelly, Deakin Univ., Australia)	TC11 – Reading Systems (Chair: Dimostenis Karatzas, Univ. of Barcelona, Spain)
TC3 Image Preprocessing Techniques (proposed)	TC3 Neural Networks & Computational Intelligence (Chair: Edmondo Trentin, UNiv. of Sienna, Italy)	TC12 Multimedia and Visual Information Systems (Chair: Sergio Escalera, Univ. of Barcelona, Spain)
TC4 Image Understanding Techniques (Founding Chair: B. Radig, Univ. of Hamburg, Germany)	TC4 Biometrics (Chair: Zeenan Sun, Chinese Academy of Sciences, China)	TC15 Graph-Based Representations (Chair: Pasquale Foggia, Univ. of Salerno, Italy)
TC5 Software Systems and Languages (Founding Chair: R. Haralick, Virginia Polytechnic Institute and State University, USA)	TC5 Computer Vision for Underwater Environmental Monitoring (Chair: Maia Hoeberechts, Ocean Networks Canada)	TC16 Algebraic and Discrete Mathematical Techniques in Pattern Recognition & Image Analysis (Chair: Davide Moroni, ISTI-CNR, Italy)
TC6 Special-Purpose Architecture (Founding Chair: M.J.B. Duff, University College of London, UK)	TC6 Computational Forensice (Chair: Jean-Marc Ogier, Univ. de la Rochelle, France)	TC18 Discrete Geometry and Mathematical Morphology (Chair: Bertrand Kerautret, LORIA, France)
TC7 Applications in Remote Sensing (Founding Chair: M. Goldberg, University of Ottawa, Canada)	TC7 Remote Sensing and Mapping (Chair: Jie Shan, Purdue Univ, USA)	TC19 Computer Vision for Cultural Heritage Applications (Chair: Guillaume Carron, Univ. de Picardie, France)
TC8 Applications in Industry (proposed)	TC9 Pattern Recognition in Human Machine Interaction (Chair: Univ. of Ulm, Germany)	
TC9 Biomedical Pattern Recognition (original name Applications in Bioengineering and Medicing; Founding Chair: J. Sklansky, University of California at Irvine, USA)		
TC10 Applications in Map Data Processing (proposed)		
TC11 Applications in Text Processing (Founding Chair: C.Y. Suen, Concordia University, Montreal, Canada)		
TC12 Automatic Speech Recognition (Founding Chair: R. De Mori, Concordia University, Montreal, Canada).		

BENCHMARK DATASETS

Editor's note: 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.

~ Jing Dong, IAPR Newsletter EiC, jdong@nlpr.ia.ac.cn

SEWA DB: A Rich Database for Audio-Visual Emotion and Sentiment Research in the Wild

<https://deepai.org/publication/sewa-db-a-rich-database-for-audio-visual-emotion-and-sentiment-research-in-the-wild>

Jean Kossaifi, Robert Walecki, Yannis Panagakis, Jie Shen, Maximilian Schmitt, Fabien Ringeval, Jing Han, Vedhas Pandit, BjÖrn Schuller, Kam Star, Elnar Hajiyeu, and Maja Pantic

<https://arxiv.org/pdf/1901.02839v1.pdf>

Abstract—Natural human-computer interaction and audio-visual human behaviour sensing systems, which would achieve robust performance in-the-wild are more needed than ever as digital devices are becoming indispensable part of our life more and more. Accurately annotated real-world data are the crux in devising such systems. However, existing databases usually consider controlled settings, low demographic variability, and a single task. In this paper, we introduce the SEWA database of more than 2000 minutes of audio-visual data of 398 people coming from six cultures, 50% female, and uniformly spanning the age range of 18 to 65 years old. Subjects were recorded in two different contexts: while watching adverts and while discussing adverts in a video chat. The database includes rich annotations of the recordings in terms of facial landmarks, facial action units (FAU), various vocalisations, mirroring, and continuously valued valence, arousal, liking, agreement, and prototypic examples of (dis)liking. This database aims to be an extremely valuable resource for researchers in affective computing and automatic human sensing and is expected to push forward the research in human behaviour analysis, including cultural studies. Along with the database, we provide extensive baseline experiments for automatic FAU detection and automatic valence, arousal and (dis)liking intensity estimation.

Speech-driven 3D Facial Motion Database (S3DFM)

<http://groups.inf.ed.ac.uk/trimbot2020/DYNAMICFACES/index.html>

Jie Zhang and Robert Fischer

ANN: dynamic 2D/3D speaking face dataset with synchronized audio

We'd like to announce a new facial biometric dataset that has:

- 1 second of 500 frame per second IR intensity video (600*600 pixels)
- 1 second of 500 frame per second registered depth images (600*600 pixels)
- synchronized 44.1 Khz audio

There are 77 participants looking at the camera.

Each is speaking the same passphrase (Ni'hao).

There are 10 repetitions for each person (for a total of 770 sets of data).

There are an additional 26 (*10 repetitions) participants that were moving their heads while speaking the same passphrase.

The data can be used for a variety of purposes:

- IR based facial recognition/verification
- 3D facial recognition/verification, speech-based recognition/verification,
- facial motion analysis, etc.

If the data is used, please cite:

Jie Zhang, Robert B. Fisher; 3D visual passcode: Speech-driven 3D facial dynamics for behaviometrics, Signal Processing, 2019, 160: 164-177.

IAPR Technical Committee News

This section the IAPR Newsletter publishes 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.

~Jing Dong, IAPR Newsletter EiC

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[TC19 Computer Vision for Cultural Heritage Applications](#)

IAPR TC3 Neural Networks & Computational Intelligence

<http://iapr-tc3.diism.unisi.it/index.html>

Edmondo Trentin, Chair

Markus Hagenbuchner, Vice Chair

We are glad to announce that our Leadership Board has completed the assessment of the bids for hosting the next edition of the TC3 biennial Workshop on Artificial Neural Networks in Pattern Recognition (ANNPR 2020), which will be the 9th in the series.

It turns out that the event will take place at Zurich University of Applied Sciences (Zurich, Switzerland), and will be co-organized with the Swiss Alliance for Data-Intensive Services in order to offer a stronger link to industry. Although the organizing Board has not been appointed officially yet, Frank-Peter Schilling and Thilo Stadelmann at the ZHAW School of Engineering are currently in charge of the preliminary organization, supported by an enthusiastic international team.

You can read the [report on ANNPR 2018](#) in this issue of the Newsletter.

For all the news on the forthcoming 9th ANNPR we invite you to check out our constantly updated website at <http://iapr-tc3.diism.unisi.it/index.htm>, where you can learn about the TC3 access brand new datasets, and possibly join us.

At <http://iapr-tc3.diism.unisi.it/Research.html>, in particular, you can find our Manifesto on "off-the-mainstream" research."



More IAPR Technical Committee News

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IAPR TC4 Biometrics

Zhenan Sun, Chair
Julian Fierrez, Vice Chair

As of 2018, TC4 has a new leadership team and will soon have a new website. Follow the link on this page <https://iapr.org/committees/biometrics>.

The most important event on the TC4 calendar is the annual International Conference on Biometrics (ICB), and the 2019 edition is coming up:

The 12th IAPR International Conference on Biometrics

<http://www.icb2019.org>

ICB is the premier forum for the presentation of new advances and research results in the fields of biometrics. The conference series formed in 2006 by merging AVBPA (Audio- and Video-based Person Authentication), ICBA (International Conference on Biometric Authentication) and other biometric workshops, and it has established itself as a leading international conference in biometrics.

The conference will have a broad scope with papers that advance biometric technologies, sensor design, feature extraction and matching algorithms, analysis of security and privacy, and evaluation of social impact of biometrics technology. In addition, Prof. Dr. Didier Meuwly (Netherlands Forensic Institute) and Prof. Oleg Komogortsev (Texas State University) will be the [Keynote Speakers](#).

Registration is open: <http://www.icb2019.org/pages/registration.html>.

We hope to see you there!



And

More IAPR Technical Committee News

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IAPR TC10 - Graphics Recognition

<http://iapr-tc10.univ-lr.fr/>

Alicia Fornés, Chair

Jean-Christophe Burie, Vice Chair

The IAPR's Technical Committee 10 on Graphics Recognition promotes interaction among researchers working in Graphics Recognition (GR). GR is an exciting field of pattern recognition, whose main relevant topics of interest include: the analysis and interpretation of graphical documents (e.g. floorplans, mathematical expressions, comics, maps, music scores, patents, diagrams, etc.), 3-D models from multiple 2-D views (line drawings), sketch recognition, analysis of graphics on new digital interfaces, etc.

For more information, including the subscription to our mailing list, please visit: <http://iapr-tc10.univ-lr.fr/>



The GREC workshops provide an excellent opportunity for researchers and practitioners at all levels of experience to meet colleagues and to share new ideas and knowledge about graphics recognition methods. The aim of this workshop is to maintain a very high level of interaction and creative discussions between participants, maintaining a "workshop" spirit, and not being tempted by a "mini-conference" model.

[GREC 2019](#) will be held in September 20-21, 2019 (Sydney, Australia) in conjunction with [ICDAR 2019](#). Three special sessions will focus on: Music Scores Recognition, Comics Analysis and Sketch Recognition. We encourage authors to submit papers on these topics, but papers on other GR topics are also welcome.

For this edition, authors are invited to submit two types of papers:

- Full papers describing complete works of research (up to 6 pages). They will undergo a rigorous review process with a minimum of 2 reviews considering the originality of work. Full papers will be published according to the same policy and conditions as ICDAR 2019 conference papers (format, length, publication site).
- Short papers providing an opportunity to report on research in progress and to present novel positions on graphic recognition (up to 2 pages). Short papers will also undergo review and will appear in an extra booklet, not in the official proceedings. The booklet will be available on the GREC 2019 website.

Important dates:

- **Submission Deadline: May 20, 2019**
- **Acceptance Notification: June 15, 2019**

For more information, please visit: <https://grec2019.univ-lr.fr/>

And still
More

IAPR Technical Committee News

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IAPR TC11 - Reading Systems

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



[Dimosthenis Karatzas](#), Chair

[Gernot Fink](#), Vice Chair

[Andreas Fischer](#), Communications

[Joseph Chazalon](#), Dataset Curator

[Michael Blumenstein](#), Education Officer

IAPR TC11 is concerned with the theory and applications of Reading Systems. We seek to study and develop systems that recognize character content and structure in handwritten and typeset documents, images, and video.

There are two conferences and one workshop associated with TC11. In odd years, the community meets at the International Conference on Document Analysis and Recognition ([ICDAR](#)) and in even years at the International Conference on Frontiers in Handwriting Recognition ([ICFHR](#)) as well as the International Workshop on Document Analysis Systems ([DAS](#)).

ICDAR 2019

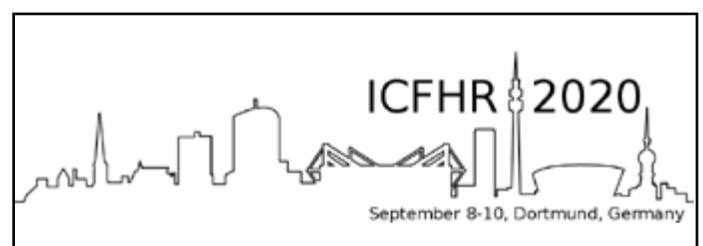
September 20-25, 2019, Sydney, Australia

At the upcoming ICDAR 2019 (<https://iapr.org/icdar2019>) in Sydney, Australia, dedicated [workshops](#) are concerned with graphics recognition, historical documents, open services, human-document interaction, camera-based document analysis, machine learning, Arabic script, industrial applications, and document forensics. Furthermore, over 20 [competitions](#) are held on challenging document analysis tasks.

Register to attend ICDAR 2019 here: <https://icdar2019.org/registration/>

For more information, please...

- visit the TC11 website (<http://www.iapr-tc11.org>),
- browse the [dataset repository](#)
- join the [mailing list](#), and
- follow TC11 on Twitter ([iapr_tc11](#)).



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IAPR TC16 Algebraic and Discrete Mathematical Techniques in Pattern Recognition and Image Analysis <http://iapr-tc16.isti.cnr.it>

Davide Moroni, Chair
Vera Yashina and Dietrich Paulus, Vice Chairs
Igor Gurevich, Honorary Chair

After a break, the activities of IAPR TC16 “Algebraic and Discrete Mathematical Techniques in Pattern Recognition and Image Analysis” have been relaunched. Indeed, the IAPR Governing Board has approved the new TC16 structure during the meeting organised at ICPR 2018 held in Beijing (China) from August 20 to August 24, 2018.

For the 2018-2020 term, Davide Moroni (CNR, Italy) has been appointed as Chair, and he will be assisted by the Vice-Chairs Dietrich Paulus (University of Koblenz-Landau, Germany) and Vera Yashina (RAS, Russian Federation). Dr.-Eng. Igor B. Gurevich (IAPR Fellow - RAS, Russian Federation) has been appointed Honorary Chair.

Approved for the first time in 1996 at the meeting of the IAPR Governing Board in Vienna (13th ICPR), the main aim of TC16 is to identify, discuss and promote emerging research trends in mathematical methods for pattern recognition, including algebraic, geometrical, topological and discrete mathematical methodologies.

For updates, please visit <http://iapr-tc16.isti.cnr.it>.

IAPR TC19 Computer Vision for Cultural Heritage Applications <http://www.cvl.iis.u-tokyo.ac.jp/IAPR-TC19>

Guillaume Caron, Chair
Olga Regina Pereira Bellon, Vice Chair
Advisors: Katsushi Ikeuchi, Roberto Scopingno, El Mustapha Mauaddib, and Takeshi Oishi

TC19 aims at bridging the expertise and resources of technologists and heritage professionals concerned with the effective and sustainable application of computer vision technology to Cultural Heritage research. TC19 can be seen as a forum to discuss how computer vision has been and can be applied to cultural heritage problems and, in turn, defines new interesting problems to work on.

Overview of activities: The international workshop on e-Heritage has been the recurrent main event of TC19 for ten years. The last edition was organized in conjunction with ICCV 2017, and the next one will be held with [ICCV 2019](#) in Seoul, Korea. More information about the new contest and the call for papers will be given soon (<http://www.eheritage-ws.org>).

Other past activities of TC19 members include lectures and tutorials as well as projects in several universities and countries. These activities were also conducted in non-member universities in order to promote the TC and increase its membership.

Membership: Interested colleagues can contact the TC board to set up such activities and visit the TC19 website (<http://www.cvl.iis.u-tokyo.ac.jp/IAPR-TC19>) to get educational materials—such as videos of talks and links to books, projects, research teams, and devices—that are going to be updated regularly. To join, email [Guillaume Caron](#), TC19 Chair.

Meeting Reports

Conferences, Workshops & Summer/Winter Schools



General Chair:

Abderrahim ElMoataz, University of Normandy, France

Program Committee Chair:

Alamin Mansouri, University of Bourgogne, France

Program Committee Co-chairs:

Driss Mammass, University Ibn Zohr, Morocco

Fathallah Nouboud University of Québec at Trois-Rivières, Canada

by Abderrahim Elmoztaz and Alamin Mansouri

ICISP 2018 was the eighth ICISP conference. Historically, ICISP is a conference resulting from the actions of researchers from Canada, France, and Morocco. Previous editions of ICISP were held in Cherbourg-Octeville (France, 2008 and 2014), in Trois-Rivières, Québec (Canada, 2010 and 2016), and in Agadir (Morocco, 2001, 2003, and 2012). ICISP 2018 was sponsored by EURASIP (European Association for Image and Signal Processing) and IAPR (International Association for Pattern Recognition).

We were very pleased to be able to include in the conference program keynote talks by world-renowned experts: Stanley Osher, (University of California Los Angeles, USA), Jean Ponce (Ecole

Normale Supérieure, France), Pierre Vanderghyest (EPFL, Switzerland), Joachim Weickert (Saarland University, Germany), Livio De Luca (MAP-CNRS, France), and for MCS 2018, Edoardo Provenzi (Math-Info, University of Bordeaux, France).



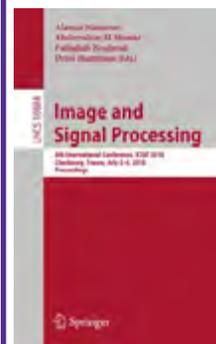
This year the International Symposium on [Multispectral Colour Science MCS 18](#) was organized as part of ICISP 2018.

Publications: As for the 2008, 2010, 2012, 2014 and 2016 editions, the proceedings of ICISP 2018 have been published by Springer Verlag in the Lecture Notes in Computer Science and *are listed in the ISI proceedings index.*

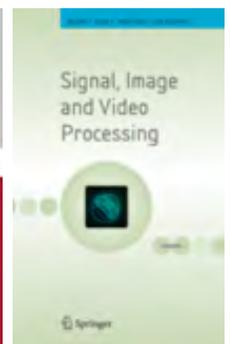
A special issue on the best papers

Publications:

Click on the image below to go the publisher's web site for the ICISP 2018 Proceedings.



Click on the image below to go the publisher's web site for the Special Issue.



of the international journal "Signal, Image and Video Processing" (impact factor = 1,2) is planned.

Statistics: The response to the call for papers for ICISP 2018 was encouraging. From 122 recorded submissions, 58 papers



were finally accepted. The review process was carried out by the Program Committee members, who are all experts in various image and signal processing areas. An average of 2.2 reviews per paper were recorded. The quality of the papers in these proceedings is attributed first to the authors and second to the quality of the reviews. We would like to thank the authors for responding to our call, and we thank the reviewers for their excellent work

Acknowledgments: We would also like to thank the members of the local committee for their advice and help.

We are also grateful to Springer's editorial staff for supporting this publication in the LNCS series. Finally, we were very pleased to welcome all the participants to this conference. For those who did not attend, we hope this publication provides a good view into the research presented at the conference, and we look forward to meeting you at the next edition of ICISP conference.

We also would like to warmly thank

- Projet RIN Normand : Modèles Non Locaux et Masses de Données: de la théorie, l'aide à la décision en Imagerie Médicale à la valorisation du patrimoine Normand (MoNoMads)
- Conseil Régional de Normandie :
- Communauté d'Agglomération du Cotentin

- NORMASTIC
- Université de Caen Normandie
- IUT Cherbourg Manche
- CNRS

Awards: The ICISP Best Paper Award was given ex-aequo to

- Simone Parisotto, Luca Calatroni and Claudia Daffara for the paper entitled "Digital Cultural Heritage Imaging via Osmosis Filtering
- Kenta Masui, Kaoru Kiyomitsu, Keiko Ogawa and Norimichi Tsumura for their paper entitled "Visualization technique for change of edema condition by volume measurement using depth camera"

Organization: The conference was organized by the Manche satellite of the Greyc Laboratory (UMR CNRS 6072, UNICAEN, ENSICAEN)

- General Chair: Abderrahim ElMoataz (France)
- Program Committee Chair Alamin Mansouri (France)
- Program Committee Co-chairs: Driss Mammass (Morocco) and Fathallah Nouboud (Canada)

- Local Arrangements/Finance Chairs: Abderrahim ElMoataz and Zakaria Lakhdari
- Proceedings and website Chair: Alamin Mansouri
- Local organization committee: Abderrahim El Moataz, Zakaria Lakhdari, Académie de Caen, Su Ruan, Pierre Buysens, François Lozes, Sophie Schupp, Jérôme Lapuyade-Lahorgue, Grégoire Olivier, Amal Mahboubi, Youssef Chahir, University of Caen Normandy, UFR Sciences - Cherbourg

Social Program: The program consisted of a Welcome Reception and a Conference Banquet that included these three amazing attractions:

- The Cherbourg abyssal aquarium, at 11 meters deep, it is the deepest aquarium in Europe, but apart from its amazing scale, it is also a life space full of colours.
- The nuclear submarine "Le Redoutable", the largest submarine open to the public in the world! A tour of the submarine will take you down into the bowels of the ship.
- An exhibition that has its like nowhere else in France, "Titanic, return to Cherbourg", about the history of European emigration to the New World and about the legendary liner that called at Cherbourg on 10th April 1912.

ICISP 2020
will be held in
Marrakech, Morocco
in June 2020



PRRS 2018
**10th Workshop on
Pattern Recognition in Remote Sensing**

Beijing, China
August 19-20, 2018

Workshop Chairs:
Eckart Michaelsen, Fraunhofer-IOSB, Germany
Jie Shan, Purdue University, USA



by Eckart Michaelsen

The Technical Committee 7 of the IAPR organizes workshops on pattern recognition applied to remotely sensed data. This has quite some tradition by now going back at least two decades. PRRS workshops come regularly every two years in close temporal and geographical neighborhood of the ICPRs.

In 2018, we had a special situation, because the ICPR was in Beijing of China, where a very huge portion of today's pattern recognition in remote sensing research is located. We could expect many more participants for a PRRS in China than if it were somewhere else. We were well aware that the usual format---a one-day workshop within the frame of the ICPR---would this time not suffice. Therefore, we contacted the state key-lab LREIS (<http://www.lreis.ac.cn/>) and in particular its head Dr. Fenzhen Su as local partner. The site of this lab and thus the venue was in very close proximity to the Beijing Convention Center where the ICPR started just after

the PRRS. Thus, the intention to draw experts and researchers from the photogrammetry and remote sensing communities to the ICPR, make them aware of the IAPR, and foster inter-disciplinary cooperation was perfectly met.

This PRRS---like most of its predecessors---was co-sponsored by IAPR-TC7, ISPRS ICWG II/III (<http://www2.isprs.org/commissions/comm2/icwg-2-3.html>) and IEEE-GRSS, and most of its participants actually are more active in the remote sensing communities than in the IAPR.

Our anticipation of a much larger participation was right. The PRRS-10-2018 turned out almost one magnitude bigger than the average previous ones. This could never have been possible within a one-day side-event. In fact, the full two-day program was packed with invited speeches, technical presentations, as well as very intense poster sessions under very good presentation conditions. We thank our Chinese hosts for their perfect organization, which we could never have provided on our

own. This includes the complete fee handling and financial issues, which are always problematic for a TC which hardly has any budget of its own.

The classical topic of pattern recognition in remote sensing is pixel-wise land-use classification from satellite or aerial images, but it also includes synthetic aperture radar (SAR) imagery, laser 3D data, and hyperspectral images. Of course, the prevailing topic this time were deep learning convolutional perceptrons applied to such data.

Whoever is interested in these topics and in the next PRRS (to be held in Italy in 2020) should contact Jie Shan (TC7 Chair, jshan@purdue.edu), or Ribana Roscher (TC7 Co-Chair, ribana.roscher@uni-bonn.de) and join the IAPR-TC7.

PRRS 2018 Proceedings
are available here:
<https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=8476691>



IAPR Summer School on Machine and Vision Intelligence

Vico Equense, Naples, Italy
August 27-31, 2018

<http://cvprlab.uniparthenope.it/vismac2018/>

Director:

Alfredo Petrosino (University of Naples Parthenope, Italy)

by Alfredo Petrosino

Overview: VISMAC 2018 aimed at addressing the theoretical and practical issues related to Machine and Vision Intelligence, with specific attention to artificial intelligence for machine vision to help solve complex industrial tasks reliably and consistently.

The School was supported by IAPR, the Italian Association on 'Computer Vision, Pattern recognition and machine Learning Italian Association' (CVPL), affiliated to IAPR, and the IAPR Technical Committees on Neural Networks and Computational Intelligence ([IAPR TC3](#)) and Multimedia and Visual Information Systems ([IAPR TC12](#)).

The School was organized as in-depth courses aimed at introducing a topic and discussing approaches, challenging aspects and open issues of the state-of-the-art research in artificial intelligence, and specifically deep learning, for computer vision. The covered topics were the fundamentals and most recent advances of different deep learning architectures, interpreting and explaining deep models in computer vision, new pooling designs like perceptually-motivated ones, supervised learning with probabilistic deep networks, pyramidal deep models for computer vision, deep models

for affective computing, design, results and winning solutions about AutoML in computer vision, incremental learning of person identities, visual geometry and modeling, other than challenges and benchmarks with intensive laboratory sessions on internationally recognized datasets for different and peculiar computer vision tasks.

To this aim, the School was organized in three sessions to help the students to deepen the covered topics. Each theoretical session (morning) was scheduled with an aimed laboratory session (early afternoon) where practitioners had to provide a solution to a problem related to the theoretical session. Also, new achievements about Intelligence, mainly machine and deep learning, in machine and vision were discussed in the 'Challenges and Benchmarks' session (late afternoon) to allow students to work with datasets and solve a research problem.

Each participant was given with a Development Kit, kindly provided by Apple Inc., with a Macbook to use during the School and to support fair access to homework sessions. Additional thanks to the iOS Foundation Program that Apple has organized since 2016 in Naples, Italy, in partnership with the University of Naples Parthenope.

The class was attended by 45 students coming from different universities, industries and research centers of eight different nationalities: Bulgaria, India, Italy, Iran, Morocco, Pakistan, Republic of Serbia, United Kingdom.

Courses and Labs: The courses were delivered by 14 world renowned experts in the field:

Iasonas Kokkinos, Facebook Artificial Intelligence Res. and University College London (UK), introduced machine learning and computer vision challenges, focusing on convolutional neural networks and sharing the results

Editor's note:

In addition to the report from the Summer School Directors, the IAPR's Executive Committee asked one of the students attending the school to submit a report that responded to the following questions:

- In general, what did you learn from the Summer School and, in particular, did you learn anything new?*
- What will you do differently because of what you learned?*
- Why was this a valuable experience for you?.*

Please see the report from Mohammed Khalooei that begins on the next page.

~ Jing Dong, IAPR Newsletter EiC

of some of his latest research presented at CVPR, called DensePose, which was further discussed in the lab session, enabling the students to practice with machine/deep learning tools.

Stefan Roth, Technische Universität Darmstadt (Germany), focused on Probabilistic Graphical Models with specific attention to Bayesian networks and probabilistic supervised deep networks, offering useful insights to attendees on how to approach uncertainty as a means of information rather than chaos. He also discussed lightweight uncertainties in supervised Convolutional Neural Networks (CNNs) with special attention to max-pooling, average pooling, strided convolution.

Wojciech Samek, Fraunhofer HHI (Germany), discussed a very critical topic for the machine/deep learning community, that is understanding how the networks actually learn and what is really significant for learning. He pushed the attendees to critically explore the CNNs blank boxes, presenting the Layer-size Relevance Propagative (LRP) analyses of the contribution of pixels over the faced issue, and he mentioned the Taylor decomposition for gradient shuttering problem, with applications in analysis of sequences, like in text, audio and video.

Alfredo Petrosino, University of Naples Parthenope (Italy), and *Ihsan Ullah*, National University of Ireland Galway (Ireland), focused on the benefits of using pyramidal structures to reduce the number of hyper-parameters thereby reducing the cost for training and improving the reliability and scalability of their model 3DPyraNet to even more complex datasets with respect to CNNs, like dynamic scene and emotion recognition.

Björn W. Schuller, University of Augsburg (Germany), and *Nicholas Cummins*, Universität Augsburg (Germany), explored topics related to speech and audio processing with special attention to Deep Learning for Affective Computing. Residual learning was demonstrated as a beneficial approach to such a task. During the lab session, some affective computing projects were presented: CAS2T for data annotation, feature extraction, image to audio representation, deep sequence to sequence auto-encoder and so on.

Silvio Savarese, Stanford University (US), introduced the latest challenges in artificial intelligence and computer vision, forcing the attendees to think about the results achieved nowadays in machine/deep learning. By answering the question “Are we in the future?”, the talk aimed to not blindly adopt state-of-the-art solutions without exploring the critical and significant aspects. Structural Recurrent Neural Network, Social Long Short-Term Memory and Generative Adversarial Networks models were also presented.

Alberto Del Bimbo, University of Florence (Italy), discussed the problems related to video streams and memory-based online learning. Neocortex and Hippocampus were presented as deep network and memory mechanism counterparts respectively. LSTM and RNN on large datasets for person identity recognition as well as Neural Turing Machine (NTM), Gradient Episode Memory (GEM) and Incremental classifier & Representation Learning (ICARL) were also presented.

Geometric properties and the structure of the camera model were discussed in detail with a proficient illustration of epipolar

Mohammad Khalooei, Ph.D. Candidate, Amirkabir University of Technology (Tehran Polytechnic) responds to questions about VISMAL 2018 from the IAPR ExCo.



I felt honoured to be an attendee at the IAPR VISMAL2018 Summer School and felt a sense of great motivation meeting different top international speakers.

Did you learn anything new?

Since the school aimed at introducing and discussing state-of-the-art research on neural networks and deep learning, I can confidently say that I learned something from each of the excellent lecturers, and I would like to point out just some key notes in this regard.

Prof. Iasonas Kokkinos gave us the chance to figure out some key factors in neural networks in terms of optimization processes of Deep Neural Networks (DNNs). Also, in my Reading Group section, I got a whole new perspective on the DensePose project, published at CVPR 2018. The professor also gave us tips on paper presentation.

Prof. Stefan Roth presented several topics of use to me: the theoretical aspects of Convolutional Neural Networks (CNN), deterministic prediction for entering probabilistic modelling with graphical model approach, and the Bayesian SegNet and Lightweight probabilistic network. I knew some of these topics and



geometry and constraints by *Venu Madhav Govindu*, Indian Institute of Science (India), and *Andrea Fusiello*, University of Udine (Italy). Venu Madhav Govindu reported details of basic steps in motion averaging like rank-based methods, matrix completion, M-estimators, IRLS, quaternion averaging, a topic for which Govindu is the most expert researcher. Andrea Fusiello's lab session offered the attendees the opportunity to learn how to efficiently and accurately estimate 3D information from 2D cameras.

Hugo Jair Escalante, NIAOE (México), discussed Autonomous Machine Learning (AutoML) as a way of developing autonomous methods for the resolution of supervised machine learning problems. ChaLearn Gesture Recognition challenges were also discussed as well as the performance of recognition methods based on human poses, objects, background and, further, emotion recognition, pose estimation, video de-captioning, personality analysis from handwritten text.

Luka Čehovin Zajc, University of Ljubljana (Slovenia), discussed

short-term and long-term tracking and provided a comparison between online and offline approaches. He also presented the Visual Object Tracking (VOT) challenges by introducing some typical applications of detection and tracking in adverse conditions, focusing the lab session on the VOT toolkit with practical examples of tracker evaluation over the VOT dataset.

Thierry Bouwmans, Université de La Rochelle (France) broadly discussed the peculiar problem in computer vision of Background Subtraction, adopting datasets and benchmarks of CDnet challenge. Introducing the BGSLibrary, authored by Bouwmans and his group, the lab session allowed students to work with the issues of video background subtraction.

The lab-sessions surely represented the most stimulating time of the School to fix the technical notes of the oral sessions and, moreover, to create fruitful interaction among the students. The arrangement of the lab room was also one of the strengths for determining the success of the School: tables and chairs were arranged to form "islands" in the

found them reflected in my latest research at CVPR called ALOCC (Adversarially Learned One-Class Classifier for Novelty Detection) and was based on Generative Adversarial Networks (GANs).

Prof. Alfredo Petrosino and Dr. Ihsan Ullah opened my mind to new approaches to implementing the hierarchical structure of DNNs. Also, their lab session on SPyr CNN gave me a hands-on-experience.

Prof. Wojciech Samek talked about some preliminaries of interpreting and explaining DNNs and the idea of Layer-size Relevance Propagative research. It was nice to know what a network learns and what it focuses on when we infer tasks!

Prof. Andrea Fusiello's lab session helped us bring 3D vision of large-scale camera estimation into implementation.

In Apple sessions with Dr. Michele Di Capua about CoreML, I had the chance to learn how the library is introducing and improving deep learning features in newer versions, to make the library available to researchers.

All the lectures I attended during the IAPR VISMAG2018 Summer School were insightful for my professional growth and will be beneficial in my academic endeavours. I also gained perspective on how to approach new problems. What I mean is that, even if I was familiar with some topics presented at the school, I learned new ways to look at a problem.

What will you do differently because of what you learned?

I got new ideas from IAPR VISMAG 2018 that I was able to apply to tasks related to my research and have shared my knowledge and valuable

room surrounded by widescreen monitors along the walls, favoring collaboration and sharing among attendees.



Activities: Three different activities were organized: Reading Group, Poster Presentation and a 24-hour 'Vision is APP to you' Hackathon.

The students who joined the *Reading Group* were asked to study one research paper, provided by the School lecturers and assigned by the School committee headed by the Program Chair Francesco Camastra, and to present the inferred and detailed research highlights. The Reading Group Presentation, led by Rita Cucchiara (Univ. of Modena and Reggio Emilia), was organized last day in a dedicated session, awarding the Best Reading Group Award to the group: Ruggeri (head and presenter), Akovic, Bruni, Cuccurullo.

Motivated participants were asked to share their research and ideas by submitting a poster visible during the whole period of the School. Ten students reported a poster of their on-going research. A *Poster Presentation* session with spotlight presentations, and a deep-in discussion was scheduled by the Program Chair Fabio Narducci to allow all students to share their ideas and research activities with the lecturers Roth, Kokkinos, Samek, and Čehovin, who attributed the Best Poster Award to Becattini.

The School also included an evening mini-course "Vision and Machine Learning for iOS Apps" from the iOS Foundation Program@UniParthenope Team to prepare the participation to the Hackathon with the aim of teaching how to design and develop an app based on Machine Learning with Kheras and CoreML tools. The 'Vision is APP to you' Hackathon was held in 24 hours with the aim to develop a prototype based on Machine Learning for Interaction, Sustainability, Quality of Life. The Apple team, Giles Deitel and Felipe Souza, came from Apple (Cupertino, USA) on the last day to judge the Best 'Vision is APP to you' prototypes based on concept, design, code and presentation, awarding the SayCheese App (Paolucci, De Falco and Capuano) and the Best App Potential Idea (Khalooei).

Conclusion: The feedback collected from all the lecturers and students was truly enthusiastic. The students demonstrated high interest in the Machine Learning and Deep Learning for Computer Vision tasks proposed at School, often creating the premises for discussion and debate. The interactions among the students through the Poster session, the Reading Group, and the Hackathon further reinforced the expected aims of the School.



(left to right) Alfredo Petrosino's wife, Simone Marinai's wife, Simone Marinai (IAPR Past-President), Alberto Del Bimbo (Lecturer), Gianluca Foresti's wife, Gianluca Foresti (President of Italian Association on Computer Vision Pattern recognition and machine Learning (CVPL)), Alfredo Petrosino (ViSMAC Director and Vice-President of CVPL).

experiences by means of presentations in different universities. I also tried to help other researchers in order to improve their work. Furthermore, I've tried to publish some summary notes from IAPR VISMAL2018 in my blog to motivate every researcher about VISMAL and IAPR events.

Why was this a valuable experience for you?

Being with top researchers from around the world was inspiring, and I believe that when a pupil feels motivated, they can achieve much greater objectives.

For me, VISMAL was a great opportunity to gather information and share collaborations with other researchers in my field of study from around the world, which expands my vision and skills. Once back home, I was able to transfer my new knowledge to my friends and other researchers and gain an even better grasp on what I had learned during the school.

One other thing I found worth mentioning was the Reading Groups activity, where students formed groups to interact and share their knowledge on a topic. This one week of sharing information with foreign friends was worth years of studying in isolation. An added benefit was the presentation of the paper assigned to each group, which inspired us to work together and share our values.

Gathering researchers together in this way makes it possible to improve the state of the art and knowledge of science. In my opinion this is a global contribution to science and paves the way for reaching the ideal of a scientific world without borders.



ANNPR 2018
8th IAPR TC3 Workshop on
Artificial Neural Networks in Pattern Recognition

Siena, Italy

September 19-21, 2018

<https://iapr.org/archives/annpr2018/>

Chairs:

[Luca Pancioni](#) (Università di Siena, Italy)

[Friedhelm Schwenker](#) (Ulm University, Germany)

[Edmondo Trentin](#) (Università di Siena, Italy)

by Edmondo Trentin

ANNPR 2018 was successfully held at the DIISM (<https://www.diism.unisi.it/en>), University of Siena, Tuscany (Italy). The ANNPR series of workshops acts as a major forum for international researchers and practitioners working in all areas of neural network-based (and, machine learning-based) pattern recognition to present and discuss the latest research, results, and ideas in these areas. ANNPR is also the biennial meeting of the IAPR's Technical Committee 3 on Neural Networks & Computational Intelligence (<http://iapr-tc3.diism.unisi.it/>). ANNPR 2018 followed the success of ANNPR 2016 (Ulm, Germany), ANNPR 2014 (Montreal, Canada), ANNPR 2012 (Trento, Italy), ANNPR 2010 (Cairo, Egypt), and ANNPR 2008 (Paris, France) to name a few. These events have always been sponsored by the IAPR.

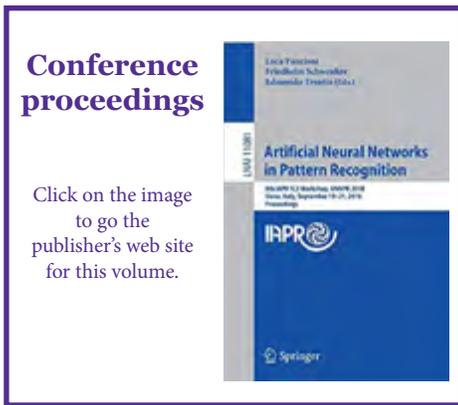
ANNPR 2018 solicited papers that presented original work in the aforementioned areas, focusing on their algorithmic, theoretical, and applied aspects. Topics of interest included both methodological

issues (e.g., supervised, partially supervised, and unsupervised learning; modular architectures and hybrid systems; multiple classifier systems and ensemble methods, etc.) and applications to pattern recognition (e.g., image processing, sensor-fusion, clustering, speech recognition, bioinformatics, etc.).

In particular, ANNPR 2018 encouraged submissions fitting TC3's Manifesto and Research Directions (<http://iapr-tc3.diism.unisi.it/Research.html>). In fact, "mainstream science is about publishing what everyone else is publishing with very small changes. You'd better at least start off that way if you want to get tenure," the sociologist Rodney Stark said. But "big ideas don't come to those who avoid risk", as John Bohannon added. The area of artificial neural networks and machine learning makes no exception to these ends. Mainstream topics, originally stemming from exciting breakthroughs (the "big ideas") that gradually become trends and end-up being mostly over-beaten publishing tracks, have characterized the scientific literature throughout the whole

history of this research field. Based on these premises, ANNPR 2018 promoted novel research developments in the areas of neural networks and learning machines that (1) were rooted in (or, aimed at) pattern recognition, and that, above all, (2) did not follow in the footsteps of already established trends.

The reaction of the Community was definitely positive: 47 manuscripts were submitted to the workshop, 30 of which were selected for presentation (18 oral presentations and 12 posters). The review process was managed by the Chairs with help from the 25 members of the international Program Committee (<https://iapr.org/archives/annpr2018/Program%20committee.html>) including researchers from 5 continents. The whole process involved more than 80 reviewers. ANNPR 2018 was attended by 39 scientists overall, including young attendees who registered via the hard-discounted Student Basic Package (with minimal benefits) that we decided to offer, for the first time, to non-presenting students wanting to attend the workshop sessions.



The Proceedings of ANNPR 2018 were published by Springer International as Volume 11081 of the series Lecture Notes in Artificial Intelligence (<https://www.springer.com/us/book/9783319999777>) under the full title “Artificial Neural Networks in Pattern Recognition - 8th IAPR TC3 Workshop, ANNPR 2018, Siena, Italy, September 19–21, 2018, Proceedings”, edited by the workshop Chairs. Thanks to the recent agreement between IAPR and Springer, the Proceedings were made available online for free to all ANNPR 2018 participants for a period of one month after the workshop closing.

The ANNPR 2018 program (<https://iapr.org/archives/annpr2018/>



Photo of some ANNPR 2018 attendees downtown.

[Program.html](#)) offered three invited speeches, six oral sessions, and one poster session. The 50-minute long invited speeches, scheduled at the beginning of each of the three days of the workshop, were given by distinguished fellow scientists active in the areas of neural networks and pattern recognition, namely:

- Marco Gori (<http://www.dii.unisi.it/~marco/>), University of Siena, Italy: What's Wrong With Computer Vision?
- Marcello Pelillo (<http://www.dsi.unive.it/~pelillo/>), University of Venice, Italy: Hume-Nash Machines: Context-Aware Models of Learning and Recognition
- IAPR invited speaker Thilo Stadelmann (<https://www.zhaw.ch/en/about-us/person/stdm/>), Zurich University of Applied Sciences, Switzerland: Deep Learning in the Wild.

The six, non-overlapping oral sessions included 25-minute long regular presentations with question time and were scheduled over

the three days of the workshop in morning and afternoon slots according to the following taxonomy:

- Session 1: Learning paradigms/ algorithms
- Session 2: Feature-oriented approaches
- Session 3: Vision and image processing
- Session 4: Probabilistic methods
- Session 5: Partially supervised learning
- Session 6: Other applications

The poster session took place on the last morning of the workshop in the cloister of the ancient Palazzo San Niccolo' which hosts the DIISM in the historical city center of Siena. The session was run in parallel with an outdoor coffee-break, creating a pleasant environment for the attendees to talk science and to discuss their plans for the future. A guided city tour was organized, as well, walking the ANNPR 2018 attendees through the narrow and fascinating medieval alleys of the old town, uphill to the Cathedral and the breathtaking Piazza del Campo, the main square where the famous medieval joust Il Palio is run twice a year, in the summer, as it has been for centuries. The tour ended in a medieval-style restaurant where the workshop banquet took place, letting everyone enjoy the typical Senese cuisine accompanied by Chianti wine.

As regards the next edition of the workshop, the Leadership Board (see [IAPR TC3 News](#) in this issue) selected Zurich University of Applied Sciences (Zurich, Switzerland) as the location of ANNPR 2020, so another successful event is soon on its way.



School Directors:

P C Yuen, Hong Kong Baptist University, Hong Kong
 Zhenan Sun, Chinese Academy of Sciences, China
 Norman Poh, University of Surrey, UK
 Local Organizing Chair
 Shiqi Yu, Shenzhen University



The IAPR/IEEE Winter School on Biometrics is a training course to promote research in biometrics and related fields. The third edition was jointly organized by the Department of Computer Science, Hong Kong Baptist University, the Institute of Automation, Chinese Academy of Sciences and College of Computer Science and Software Engineering, Shenzhen University. It was co-sponsored by the IAPR and the IEEE.

There were 62 participants which includes 52 participants who paid the registration fee and 10 volunteer students. There was one participant from India, one from Cuba and four from Hong Kong SAR, China. The remaining participants were from Mainland China. Five excellent students

received IAPR Student Travel Grant Awards.

Presentations were given by sixteen internationally renowned lecturers from academia and industry who presented the most up-to-date view in biometrics, and shared their experiences with young students and researchers. They were Prof. Julian Fierrez, Prof. Josef Kittler, Prof. Ajay Kumar, Dr. Liang Li, Prof. Brian Lovell, Prof. Davide Maltoni, Prof. Sébastien Marcel, Prof. Mark Nixon, Dr. Norman Poh, Prof. Arun Ross, Prof. Zhenan Sun, Prof. Tieniu Tan, Prof. Massimo Tistarelli and Prof. Yasushi Yagi.

The topics covered biometric identification with iris, face, gait, fingerprint, and signature as well as spoofing and anti-spoofing,

A Great Experience at the Winter School on Biometrics 2019
 by Surabhi Garg

I am a fourth-year PhD student at Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi). I attended the IAPR/IEEE Winter School on Biometrics 2019 in January. The winter school to me was a great experience. We had many opportunities to meet experts in the field of biometrics and gain some interesting insights.

I reached Shenzhen via Hong Kong in late evening on 12th January, tired and jetlagged. It was hard to wake up next morning for the very first lecture at winter school. The first day of the winter school began with warm greetings by winter school volunteers and Dr. Shiqi Yu.

All of the lectures were very interesting and informative, coming up with a lot of new open problems in the area of biometrics.



I talked to several speakers, who cleared my queries. Basically, the topics at winter school focused on



privacy and security in biometric systems, multimodal biometrics, and biometrics applications. Many participants reported that they benefited a lot from the lectures.

A hands-on session was designed for the winter school. Three experts, two principle developers on the OpenCV team, and one doctor from Shenzhen University, discussed how to develop a real-time face recognition system. Most participants finished a project on face recognition and submitted

their reports on the project.

To encourage sharing and communication, an open poster session and a half-day social program were organized. The social program included visiting the IT giant Tencent company and the 4th highest tower in the world, Ping An Financial Center.

At the end of the winter school, certificates signed by the school directors were given to participants who attended all the lectures. Six students got awards for

their outstanding projects in the hands-on session: Yuxuan Zhang, Pengze Zhang, Ningjie Liu, Zhenguo Hu, Zhi Zhang and Zilong Zhang.

In addition to the support from academia, the winter school was also greatly supported by industry. The number of industry sponsors increased to 4 this year. They were Ping An Tech, Iris King, AIV and Watrix.

new technologies in biometrics. The lectures on biometrics based e-payments from sponsor companies were very useful. And the poster session paved the way for many more problems that need to be solved. My poster



demonstration went quite well also, and I discussed the ideas in my paper with many participants.

I loved the Tencent company and PingAn Center visit which showed Chinese technologies and work culture. The PingAn Center gave a beautiful view of all of Shenzhen.

In the end, I learned latest trends and concepts in biometrics, made friends including the volunteers who were there every time to help me out with the food and language difficulties.

I would like to thank the organizing

committee for selecting me, and the IAPR for providing the student travel grant to help me to attend the winter school. I enjoyed travelling to the beautiful city of electronics, Shenzhen.



ICPRAM 2019

8th International Conference on Pattern Recognition Applications and Methods

Prague - Czech Republic

19 - 21 February, 2019

Conference Chair:

Ana Fred, Instituto de Telecomunicações and Instituto Superior Técnico - Lisbon University, Portugal

Program Co-Chairs:

Maria De Marsico, Sapienza Università di Roma, Italy

Gabriella Sanniti di Baja, Italian National Research Council CNR, Italy

Local Chair:

Michal Haindl, Institute of Information Theory and Automation, Czech Republic

by the Conference and Program Chairs

ICPRAM2019 was held in Prague, the wonderful capital of the Czech Republic. The series of ICPRAM annual conferences is sponsored by the "Institute for Systems and Technologies of Information, Control and Communication (INSTICC)", and is endorsed by the IAPR. As with previous editions, ICPRAM2019 was organized "in cooperation" with a number of international organizations involved in research related to Pattern Recognition and Artificial Intelligence: the Association for the Advancement of Artificial Intelligence (AAAI), the Italian Association for Artificial Intelligence (AI*IA), the Associação Portuguesa de Reconhecimento de Padrões (APRP), and the International Neural Network Society (INNS).

Since its first edition, the main goal of ICPRAM has been to provide a meeting point for researchers involved in investigating the manifold facets of pattern recognition and artificial intelligence, and active in either theory development or application design and implementation. During the conference, the attendees

had the possibility to exchange ideas among themselves and also with the invited speakers, regarding their respective scientific achievements and future research plans. The intended goal was to spur new and original threads of collaboration in order to investigate brand new approaches.

ICPRAM2019 received 138 submissions from 36 countries. Out of the accepted papers, 25 were selected for oral presentation as full papers, 52 for oral presentation as short papers, and 32 for poster presentation. As a further occasion to stimulate discussion and scientific growth, the conference program included a panel titled "Hopes and risks of Artificial Intelligence". The panel was chaired by the ICPRAM Local Chair, Michal Haindl, and the three internationally distinguished ICPRAM2019 invited speakers (Bram van Ginneken, Michal Irani, and Davide Maltoni) gave their opinions and stimulated an interesting discussion with the audience.



In addition, the invited speakers also presented the following plenary lectures:



Bram van Ginneken, Radboud University Medical Center, Netherlands: Deep

Learning in Image Diagnostics: Recent Results and Outlook



Michal Irani, IAPR Distinguished Speaker, Weizmann Institute of Science, Israel:

Unsupervised Internal Learning



Davide Maltoni, University of Bologna, Italy: Double-identity Biometrics

In addition to the forthcoming Springer LNCS volume, ICPRAM 2019 Proceedings are available through the SCITEPRESS digital library. Click on the image below to go to the website.



All photos courtesy of INSTICC ICPR 2019.

The conference organization assigned three awards to be given during the conference: the Best Paper Award, the Best Student Paper Award and the Best Poster Presentation Award. The winning papers were chosen by the Program/Conference Chairs based on the best combination of review marks, assessed by the Program Committee, and of paper presentation quality, assessed by Session Chairs and Program Chairs at the conference venue. The winning poster was chosen according to the evaluation by Program Chairs and by the attendees, who were asked to express their preferences. For this edition, the winning papers were:

Best Paper Award



"All Together Now! The Benefits of Adaptively Fusing Pre-trained Deep Representations" by Yehezkel S. Resheff, Itay Lieder and Tom Hope

Best Student Paper Award



"Goal-conditioned User Modeling for Dialogue Systems using Stochastic Bi-Automata" by Manex Serras, María Inés Torres and Arantza del Pozo

Best Poster Presentation Award

"Automatic Perception Enhancement for Simulated Retinal Implants" by Johannes Steffen, Georg Hille and Klaus Tönnies

As in the last editions, the Authors of ICPRAM2019 selected papers will be invited to submit a revised and extended version of their work for a book in the Springer LNCS Series.

As usual, besides the interesting technical program, ICPRAM2019 also offered a number of social events, where the participants had different opportunities to meet and discuss in a relaxed atmosphere.

A Welcome Reception was offered to all participants on the first conference day. On the second day participants were given the opportunity to live a full Czech experience at the U Pavouka Medieval Tavern, a unique restaurant decorated with large wooden tables, torches, iron chandeliers, spider webs, ancient utensils, wine barrels, ropes and more within the rustic stone walls. The attendees were able to enjoy a special show taking them back hundreds of years, including belly dancing, sword fighting, a live historical concert with real medieval instruments, and a fire show.



The gala dinner

We look forward to seeing you at the 9th edition of ICPRAM in Malta, February 22-24, 2019 (<http://www.icpram.org/?y=2020>).

ICPRAM 2020
9th International Conference on Pattern Recognition Applications and Methods
 Valletta - Malta
 22 - 24 February, 2020



BOOKSBOOKSBOOKS

Deep Learning and Convolutional Neural Networks for Medical Image Computing: Precision Medicine, High Performance and Large-Scale Dataset

by Le Lu, Yefeng Zheng, Gustavo Carneiro, and Lin Yang, Editors

Springer, 2017

<https://www.springer.com/us/book/9783319429984>

Reviewed by Guang Yang, Imperial College London, UK

Medical image computing is an important research area that combines multidisciplinary advanced topics, e.g., mathematical modelling, medical physics, imaging, computer programming, big data and their applications in healthcare and personalised medicine.

It is very timely that this book has been edited and summarised for advanced topics, covering different aspects of the medical image computing, for example, detection and localization, segmentation, and text-image deep mining.

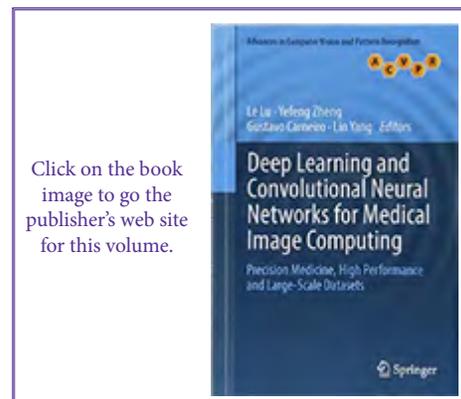
There is an increased demand for organising and analysing the data due to the ubiquitous nature of the medical devices. The single perceptron layer network and the linear classifier are popularly known; however, they cannot be used for data classification as not all the data generated are linear. Shallow networks with one or two hidden layers may partly mitigate the problem. Deep learning uses a multi-layer perceptron network that is an effective way to extract features, it can be used for classification and regression where its quantitative

performance has significantly contributed to information retrieval, speech recognition, visual object recognition, object detection, and automatic image caption.

Different from publicly available computer vision or image processing database with generally well-defined target labels (e.g. face images), labels for medical image data are hard to obtain.

The labelling of the medical data requires active collaboration from clinically trained domain experts. In comparison to some computer vision labelling tasks on natural objects, the definition of medical ground truth is tacit, requires expert knowledge, and has large inter and intra-observer variances. In addition, the patient information is treated as sensitive and confidential and requires strict regulatory approvals. This makes medical image computing a challenging task, requiring cross-domain collaboration between clinicians and computer scientists. This book discusses some of these challenges and presents several pioneer studies with solutions.

In general, there are three reasons for us to use the deep network. Firstly, insufficient network depth (e.g., a shallow network) can make the number of nodes in the flow graph (used for representing deep architecture) grow very large. Secondly, the deep network mimics human brain working, e.g., the visual cortex is well-studied and shows a sequence of areas each of which contains a representation of the input, and signals flow from one to the next. Thirdly, the deep network is similar to human cognition that process input information hierarchically,



Click on the book image to go the publisher's web site for this volume.

learning simpler concepts and then composing them to build more abstract ones [1].

According to Shen et al. [2], in terms of input types, we can classify deep models as typical multilayer hierarchical neural networks that take unstructured vector formatted values as input or as CNNs that take structured 2D or 3D values as input. Due to the abundant information embedded in the neighbourhood voxels especially for the structural medical images that normally represent anatomical characteristics of the imaged organs, CNNs have been widely used in medical image analysis (discussed in the Chapters 3, 5, 7, 8 and 11 for various applications). Together with CNNs and other deep models, e.g., stacked autoencoders (Chapter 15) and deep belief networks (DBNs, Chapters 12 and 13), deep neural networks have been successfully applied to landmark detection (Chapter 4), computer aided detection and diagnosis (Chapters 3, 6, 8 and 11), cell detection (Chapters 5 and 9), cell segmentation (Chapter 15), image enhancement (Chapter 10), disease detection and segmentation (Chapters 7 and 13), anatomy segmentation (Chapters 12, 14 and 16) and clinical data

mining (Chapter 17).

Organisation and features: this book consists of 17 chapters that covers a range of topics from surveys of recent proposed deep learning approaches to state-of-the-art deep learning applications in object detection, semantic segmentation and other applications.

Chapter 1 provides a review of research studies in medical imaging based computer-aided diagnosis and an outlook on recent developments in deep learning techniques for medical image analysis and computing problems. Chapter 2 gives a comprehensive survey of recently proposed deep learning methods in medical image analysis and computing, e.g., detailed reviews on recent advances in abdominal, chest and cardiology imaging, histopathology cell imaging and analysis of chest X-ray and mammography data.

Chapter 3 shows an efficient false positive reduction approach by integrating 2D and 2.5D random aggregation based deep CNNs into automated computer aided detection pipelines. Chapter 4 presents an efficient and robust landmark detection using 3D volumetric deep neural networks.

Chapter 5 describes a novel cell detection method by combining the maximum weight independent set selection and CNN. Such ensemble detection shows boosted accuracy in cell detection. Chapter 9 summarises another deep CNN based cell detection method, but with sparse kernel based acceleration and using weak manual labelling.

Chapter 6 reports on the latest deep learning based method for histopathological image analysis and its application in two challenging problems. Chapter 8 presents discussions of three

important means of deep CNN architectures for computer aided detection problems: training the CNN from scratch, using off-the-shelf pre-trained CNN features, and transfer learning. Chapter 11 discusses fine-tuning aspects of using the CNN.

Chapter 7 reports on a deep CNN method for interstitial lung disease detection, and Chapter 13 works on breast lesion detection and segmentation using deep CNN and deep belief network. Chapter 10 describes an interesting deep learning application in medical image enhancement, e.g., image super-resolution.

Chapter 12 reports on a deep learning based segmentation method coupling distance regularised level set (a method with numerical computations) and deep learning based inference. Chapter 14 describes a deep learning based segmentation method for kidney segmentation from CT images using local versus global image context, Chapter 15 presents deep stacked denoising autoencoders for skeletal muscle cell segmentation from histopathological images, and Chapter 16 shows a bottom-up deep learning approach for automatic pancreas segmentation from contrasted CT images. Chapter 17 discusses some novel studies on interleaved text/image deep data mining on a large-scale database for automated image interpretation, which may be difficult to achieve without deep learning.

In conclusion, I am glad to have had the opportunity to review this book, which is very suitable for students, researchers and practitioner. In addition, the book provides an important and useful reference for experienced researchers on particular aspects of deep learning based medical

image analysis. In general, the book is well organised and edited with three main blocks--detection, segmentation, and text-image joint learning--that can be easily followed. Personally, I would like to see more advanced topics in new applications of deep learning, e.g., deep learning based medical image reconstruction [3,4,5], registration [6] and synthesis [7] and medical applications of generative adversarial networks.

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FREE BOOKS / eBOOKS



Various publishers have partnered with the IAPR Newsletter to offer free books/ebooks to reviewers. If you have interest in and some knowledge of the topic, email us. Depending upon the publisher's availability, you will get an ebook or a hardcopy book or both. In some cases, the publisher may send the ebook first and the hardcopy after review.

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



We are offering the following Springer titles for review:

- * **"Denoising of Photographic Images and Video"** by Marcelo Bertalmio (Ed.): <https://www.springer.com/book/9783319960289>
- * **"Composing Fisher Kernels from Deep Neural Models"** by Tayyaba Azim and Sarah Ahmed: <https://www.springer.com/book/9783319985237>
- * **"Nonlinear Eigenproblems in Image Processing and Computer Vision"** by Guy Gilboa: <http://www.springer.com/book/9783319758466>
- * **"Domain Adaptation in Computer Vision Applications"** by Gabriela Csurka (Ed.): <http://www.springer.com/book/9783319583464>
- * **"Deep Learning for Biometrics"** by Bir Bhanu et al. (Eds.): <http://www.springer.com/book/9783319616568>
- * **"Decision Forests for Computer Vision and Medical Image Analysis"** by Antonio Criminisi and J. Shotton (Eds.): <http://www.springer.com/gb/book/9781447149286>
- * **"Handbook of Biometric Anti-Spoofing, Second Edition"** by Sébastien Marcel et al. (Eds.): <http://www.springer.com/book/9783319926261>
- * **"Hierarchical Perceptual Grouping for Object Recognition"** by Eckart Michaelsen and Jochen Meidow: <http://www.springer.com/book/9783030040390>
- * **"Contactless 3D Fingerprint Identification"** by Ajay Kumar: <http://www.springer.com/book/9783319676807>



We are offering the following from CRC Press:

- * **Image Operators: Image Processing in Python** by Jason M. Kinser: <https://www.crcpress.com/Image-Operators-Image-Processing-in-Python/Kinser/p/book/9781498796187>
- * **A Beginner's Guide to Image Pre-processing Techniques** by Jyotismita Chaki and Nilanjan Dey: <https://www.crcpress.com/A-Beginners-Guide-to-Image-Pre-processing-Techniques/Chaki-Dey/p/book/9781138339316>
- * **Imaging from Spaceborne and Airborne SARs, Calibration, and Applications** by Masanobu Shimada: <https://www.crcpress.com/Imaging-from-Spaceborne-and-Airborne-SARs-Calibration-and-Applications/Shimada/p/book/9781138197053>
- * **Remote Sensing Time Series Image Processing** by Qihao Weng: <https://www.crcpress.com/Remote-Sensing-Time-Series-Image-Processing/Weng/p/book/9781138054592>
- * **Remote Sensing and Cognition: Human Factors in Image Interpretation** by Raechel A. White, Arzu Coltekin, and Robert R. Hoffman: <https://www.crcpress.com/Remote-Sensing-and-Cognition-Human-Factors-in-Image-Interpretation/White-Coltekin-Hoffman/p/book/9781498781565>
- * **High Spatial Resolution Remote Sensing: Data, Analysis, and Applications** by Yuhong He and Qihao Weng: <https://www.crcpress.com/High-Spatial-Resolution-Remote-Sensing-Data-Analysis-and-Applications/He-Weng/p/book/9781498767682>
- * **Image Processing and Data Analysis with ERDAS IMAGINE®** by Stacy A. C. Nelson and Siamak Khorram: <https://www.crcpress.com/Image-Processing-and-Data-Analysis-with-ERDAS-IMAGINE/AC-Nelson-Khorram/p/book/9781138034983>
- * **Planetary Remote Sensing and Mapping** by Bo Wu, Kaichang Di, Jürgen Oberst, Irina Karachevtseva: <https://www.crcpress.com/Planetary-Remote-Sensing-and-Mapping/Wu-Di-Oberst-Karachevtseva/p/book/9781138584150>
- * **GIS-Based Simulation and Analysis of Intra-Urban Commuting** by Yujie Hu, Fahui Wang: <https://www.crcpress.com/GIS-Based-Simulation-and-Analysis-of-Intra-Urban-Commuting/Hu-Wang/p/book/9780367023034>
- * **Low Power Circuits for Emerging Applications in Communications, Computing, and Sensing** by Jyotismita Chaki, Nilanjan Dey: <https://www.crcpress.com/Low-Power-Circuits-for-Emerging-Applications-in-Communications-Computing/Yuan/p/book/9781138580015>
- * **Compressed Sensing for Engineers** by Angshul Majumdar: <https://www.crcpress.com/Compressed-Sensing-for-Engineers/Majumdar/p/book/9780815365563>
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- * **Optical Remote Sensing of Ocean Hydrodynamics** by Victor Raizer: <https://www.crcpress.com/Optical-Remote-Sensing-of-Ocean-Hydrodynamics/Raizer/p/book/9780815360148>
- * **Image Analysis, Classification and Change Detection in Remote Sensing: With Algorithms for Python, Fourth Edition** by Morton John Canty: <https://www.crcpress.com/Image-Analysis-Classification-and-Change-Detection-in-Remote-Sensing-With/Canty/p/book/9781138613225>



We are offering the following from Sebtel Press, Sheffield, UK:

- * **Principles of Neural Information Theory: Computational Neuroscience and Metabolic Efficiency** by Dr. James V. Stone: <http://jim-stone.staff.shef.ac.uk/BookNeuralInfo/NeuralInfoMain.html>



This bulletin board
contains items of interest to the
IAPR Community

SAVE THE DATE

ICPR 2020

September 13-18, 2020

Milan, Italy

Check the website often for the
latest information:

<https://iapr.org/icpr2020>



1st EURASIP-GAIPDM
Seasonal School

“Learning from Signals, Images,
and Video”

Thessaloniki, Greece

July 15 and July 19, 2019

<https://gaipdm-schools.web.auth.gr/>

Important Dates:

Early registration until June 20, 2019

Late registration until July 15, 2019



Letter to the Editor:

Good evening-

I am an MD/PhD candidate working with Stanford University radiologists to study perspectives on AI and Radiology. Would you be willing to forward the below survey solicitation to the IAPR listserv?

There is intense interest and speculation in application of Artificial Intelligence (AI) to Radiology. With some AI experts suggesting that computation will completely replace human radiologists.

We are radiologists and AI researchers from Stanford. We want to poll experts', such as yourself, outlook on AI's influence in Radiology.

We would appreciate your filling out the very brief (2-3 min) survey, link below. Your answers will be directly compared with responses to the same questions from >100 expert radiologists.

This data will be published in a Radiology or technology journal, will help guide development, and would serve as a historical time stamp that would show, years from now, which group of experts' perception was closer to reality.

Survey link: <https://goo.gl/forms/mv2z22iQsFFTLVwk1>

Thank you!

Adam Eltorai, PhD, Alex Bratt, MD, Haiwei Henry Guo, MD, PhD

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 is still open.

+ Plus sign denotes pending application for IAPR endorsement/sponsorship + * Asterisks denote non-IAPR events *

	Meeting	Report on previous edition	Venue	
2019	MAY	IWBF 2019 : 7th International Workshop on Biometrics and Forensics	IWBF 2018 Mexico	
		PRIP 2019 : 14th Intl. Conf. on Pattern Recognition and Information Processing	PRIP 2016 Belarus	
		MVA 2019 : 16th International Conference on Machine Vision Applications	MVA 2017 Japan	
	JUN	ICB 2019 : 12th IAPR International Conference on Biometrics	ICB 2018 Greece	
		SCIA 2019 : 21st Scandinavian Conference on Image Analysis	SCIA 2017 Sweden	
		GbR 2019 : 12th International Workshop on Graph-based Representation	GbR 2017 France	
	JUL	MCPR 2019 : 11th Mexican Congress on Pattern Recognition	MCPR 2018 Mexico	
		IbPRIA 2019 : 9th Iberian Conf. on Pattern Recognition and Image Analysis		Spain
	AUG	ICPRS 2019 : 10th International Conference on Pattern Recognition Systems	ICPRS 2018 France	
		ISAIR 2019 : 4th International Symposium on Artificial Intelligence and Robotics	ISAIR 2018 Korea	
	SEP	ICIG 2019 : 18th Intl. Conference on Computer Analyssi of Images and Patterns	ICIG 2017 China	
		CAIP 2019 : 18th Intl. Conf. on Computer Analysis of Images and Patterns		Italy
		ICIAP 2019 : 20th International Conference on Image Analysis and Processing	ICIAP 2017 Italy	
		* GCPR 2019 : German Conference on Pattern Recognition *		Germany
		GREC 2019 : 13th IAPR Intl Workshop on Graphics Recognition (w/ ICDAR 2019)	GREC 2017 Australia	
		HIP 2019 : 5th Intl Workshop on Historical Document Imaging and Processing (w/ ICDAR 2019)	HIP 2017 Australia	
		ICDAR-OST : 2nd Intl Workshop on Open Services & Tools for Document Analysis (w/ ICDAR 2019)		Australia
		ICDAR 2019 : 15th International Conference on Document Analysis Systems	ICDAR 2017 Australia	
		OCT	CVIP 2019 : 4th Intl. Conference on Computer Vision and Information Processing	CVIP 2018 India
		NOV	CIARP 2019 : 15th 24th Iberoamerican Congress on Pattern Recognition	CIARP 2018 Cuba
DEC	ACPR 2019 : 5th Asian Conference on Pattern Recognition	ACPR 2017 New Zealand		
	PReMI 2019 : 8th Intl. Conference on Pattern Recognition and Machine Intelligence	PReMI 2017 India		
	MedPRAI 2019 : 3rd Mediterranean Conference on Pattern Recognition and Artificial Intelligence	MedPRAI 2018 Turkey		
2020	SEP	ICFHR 2020 : 17th Intl. Conference on Frontiers of Handwriting Recognition	ICFHR 2018 Germany	
		ICPR 2020 : 25th International Conference on Pattern Recognition	ICPR 2018 Italy	

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