

IAPR

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Newsletter

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Special Issue

It is with great sadness that we report the passing of Herb Freeman, a pioneer in our field and one of the founders of IAPR more than 40 years ago. The ExCo expresses our deepest condolences to Herb's family, friends, and colleagues on behalf of the entire IAPR community.

Herb had a long and productive career that touched many, many people. He worked on the development of the first electronic computers in the early days of computing, and helped initiate computing engineering as a discipline at three major U.S. universities. He published over 100 papers, authored a number of books, and helped to establish important journals. He was one of the select group of founders who organized the first "ICPR" in 1973, which marked the start of his leadership service that culminated in his role in the formal founding of IAPR in 1978. Over the years Herb served as a Vice President, Treasurer, and ultimately President of IAPR. He was awarded the K.S. Fu Prize in 1994.

Herb's numerous important contributions in the early days of our field place him in very rare company; he will be missed. I encourage you to read the personal remembrances of Herb in this Special Memorial Issue of the IAPR Newsletter.

*With deep sympathy,
Dan Lopresti, IAPR President*

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In Memoriam: Herbert Freeman

December 13, 1925 - November 15, 2020

by Gabriella Sanniti di Baja
ICAR-CNR, Naples, Italy

Prof. Herbert Freeman, one of the IAPR founders, passed away on November 15, 2020, at his home in New Jersey. He would have celebrated his 95th birthday one month later. He was survived by his wife Joan and his daughters Nancy and Susan and predeceased by his son Robert. He was the happy grandfather of six grandchildren and great-grandfather of six great-grandchildren.

Herbert (Herb to his family and friends) was born in Germany in 1925 and moved to the United States in 1938. He received his B.S.E.E. degree from Union College, Schenectady, NY, in 1946, his Masters in 1948 and Dr.Eng.Sc. degrees from Columbia University in 1956.

In the period 1948-1960, he worked at Sperry Corporation and designed SPEEDAC, the company's first digital computer. In 1960, he joined the Electrical Engineering Department at New York University, where he became Chairman in 1968. In the period 1975-1985, he was



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/

2021

[CIARP PORTO 2021](#)

25th Iberoamerican Congress on Pattern Recognition
Porto, Portugal
Deadline: Feb. 14, 2021
Dates: May 10-13, 2021

[MCPR 2021](#)

13th Mexican Congress on Pattern Recognition
Mexico City, Mexico
Deadline: Feb. 22, 2021
Dates: Jun. 23-26, 2021

[IJCB 2021](#)

2021 International Joint Conference on Biometrics
Shenzhen, China
Deadline: Mar. 24, 2021
Dates: Aug. 4-7, 2021

[MVA 2021](#)

17th International Conference on
Machine Vision Applications
Nagoya, Japan
Deadline: Mar. 31, 2021
Dates: Jul. 25-27, 2021

[IWAIPR 2021](#)

VII International Workshop on
Artificial Intelligence and Pattern Recognition
Havana, Cuba
Deadline: May 10, 2021
Dates: Oct. 5--7, 2021

Professor and Director of the Image Processing Laboratory at Rensselaer Polytechnic Institute, in Troy, NY. Since 1985, he has been State of New Jersey Professor of Computer Engineering at Rutgers University in Piscataway, NJ, where he also served as the first Director of the Center for Computer Aids for Industrial Productivity. In 1997, he founded Maptext, Inc., devoted to automated labeling of paper maps.

Professor Freeman is the author or editor of seven books and has published more than 120 articles in the technical literature. His technical achievements are milestones for the scientific community. Among them, the invention of the Freeman chain code for line-drawing representation, the concept of characteristic views in machine vision, and the development



Herb Freeman, King-Sun Fu, Toshiuko Sakai, and Theo Pavlidis during a break at the 3rd International Conference on Pattern Recognition in Kyoto, Japan, 1978.

of automated cartographic text placement technology play a highly relevant role.

Herb was also a co-founder with Azriel Rosenfeld of the Journal of Computer Graphics and Image Processing that was later named

the Computer Graphics, Vision, and Image Processing Journal, and successively split into two different journals.

In recognition of his brilliant scientific production, Herb got numerous awards such as the K.S. Fu Prize—most important IAPR award—that he received in 1994 for his pioneering contributions to the representation and analysis of line drawing data, and the Medaglia Teresiana of the University of Pavia, Italy, that he received in 1996 for his contributions to the field of pattern recognition.

Herb was Chairman of the IEEE Computer Society's Technical Committee on Pattern Analysis and Machine Intelligence, program chair of the 1974 IFIP World Congress in Stockholm, Sweden, IAPR founding member, IEEE Life Fellow, NSF Post-Doctoral Fellow, Guggenheim Fellow, IAPR Fellow, and ACM Fellow. Within IAPR, Herb held prominent positions and, in particular, was President for the term 1978-1980.

He held visiting positions at M.I.T., the Swiss Federal Institute of Technology, the University of Pisa, Stanford University, and the Technion, Israel Institute of Technology.

Herb was the first foreign "big" in the field of pattern recognition and the closely related fields of image processing and computer graphics that I had the fortune to know. In the mid-seventies, when I had only recently started my research activity in pattern recognition, my mentors (Stefano Levioldi, Luigi Cordella and Carlo Arcelli) organized a workshop at the CNR Institute of Cybenetics in Arco Felice, Naples. One of the two invited speakers was Prof. Freeman. At that time, in addition to having still limited

knowledge in the field, I also had a poor command of English and tended to remain silent because of the embarrassment caused by my not being fluent in English. Prof. Freeman encouraged me (speaking to me in Italian!) to overcome shyness and speak in English even if with some grammatical and pronunciation errors, perhaps mindful of the fact that, when he arrived in the United States in 1938, he himself had nothing but a school knowledge of English.

After that workshop, I had many opportunities to meet Herb again in Italy, where he particularly loved coming, and around the world whenever we were attending the same conferences. I always enjoyed very much talking with Herb about our common research interests, both during the conference sessions and in a more relaxed atmosphere during the free time.

One of the most relevant moments in my long acquaintance with Herb was definitely the NATO School on Map Data Processing held in Maratea, Italy, in June 1979. At that school, organized by Herb together

with Goffredo Pieroni I met most of the people in the field that would have played an important role in the IAPR community and in my professional life. Like the ancient Romans counted the years "ab urbe condita", i.e., from the foundation of Rome, I (and possibly not only me!) have often used the "Maratea School" as the date on which it all began.

Unfortunately I did not carry out research activities with Herb, but I still had the opportunity to work with him, for example in the organization of international conferences such as the 9th ICPR, Rome 1988, of which Herb was Program Chair, Stefano Levioldi General Chair, and I took care of Publicity. In the same year, I was entrusted with the role of General Chair for the 5th ICIAP (Positano, Italy, 1988) and on that occasion I had Herb as invited speaker.

Of course, meeting Herb at ICPR was the norm for me since 1982, my first attendance at the 6th ICPR in Munich, Germany, until Herb's last participation at the 19th ICPR in Tampa, 2008.

Every time we met at ICPR, Herb



Hanan Samet, Gabriella Sanniti di Baja and Herbert Freeman during free time at the 3rd SCIA, Lyngby, Denmark, 1983.

reminded me that he was the only one who had attended all editions of the conference, including the Joint Conferences which had been held before the formal founding of the IAPR. I could only argue that I had not skipped any single ICPR since 1982, but of course his record was unbeatable.

When during ICPR 2008 in Tampa Herb told me that this would be his last participation, I told him that in my opinion he could have continued to attend many new editions of the conference. He replied that he had realized that he knew fewer and fewer of the attendees—and fewer of them knew him. Moreover, he said that many of his friends and colleagues from the early days of IAPR had either withdrawn or passed away,

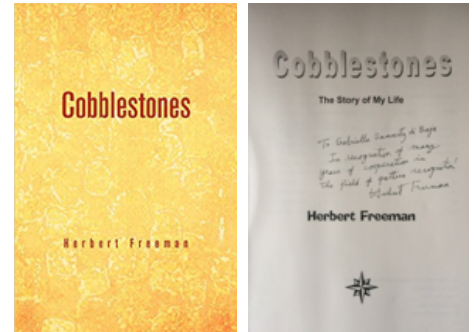
and it was time for him also to let younger people take over. I must say that today, after 12 years since then, I perfectly understand his motivations, and I totally agree on the opportunity also for me to take a step back.

We were also meeting sometimes during non scientific events. I think the last time was in November 2006 in Rome for Stefano Levialdi's retirement on the occasion of Stefano's seventieth birthday. Then, we continued to stay in touch by email until a couple of years ago.

The last memory Herb left me is his autobiography "Cobblestones" (https://www.amazon.com/Cobblestones-Story-Life-Herbert-Freeman/dp/1441503021#reader_B079KGHRDW) which he sent

me some time ago. I recommend reading it to everyone to learn more about a great scientist and a great man.

Ciao Herb, we will miss you!



*To Gabriella Sanniti di Baja
In recognition of many years of
cooperation in the field of pattern
recognition.*

Herbert Freeman



Herbert Freeman giving his invited talk at SICIAP, 1988.



Walter Kropatsch, Azriel Rosenfeld and Herbert Freeman at the Vienna ICPR, 1996.



George Nagy, Herbert Freeman and Jake Aggarwal at ICPR 2008.



Herbert and Joan Freeman with Mrs. Aggarwal and Mrs. Ejiri at ICPR 2008.

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 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. 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.

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:

(see examples at the URL 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:

For students:

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

NOTE: At the time of publication, there were 42 opportunities listed and more than 10,400 accesses since November 2017.

Contact Information:

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

From the IAPR
Executive Committee (ExCo):

**Call for Proposals for
Summer/Winter Schools**

<https://iapr.org/conferences/summerschools.php>

Deadline schedule:

Deadline:	School dates:
February 1st	April-July
June 1st	August-November
October 1st	December-March

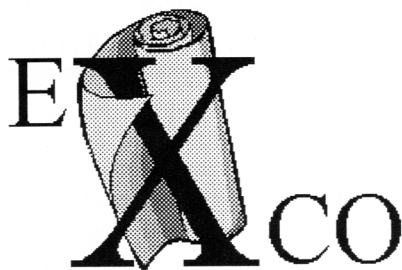
Summer/winter schools are training activities that expose participants to the latest trends and techniques in the particular pattern recognition field.

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/winter 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](#).

From the



**The IAPR ExCo on...
Letter from the President**

by Dan Lopresti (USA)

IAPR President
president@iapr.org



**News from the IAPR
Executive Committee**

- [ICPR 2020](#) was a huge success! [Subscribe](#) to the *IAPR Newsletter* so you don't miss the Special Issue coming in April!
- The IAPR has a new [ExCo](#) for 2020-2022:
President: Dan Lopresti (USA)
Past President: Apostolos Antonacopoulos (UK)
1st VP: Lale Akarun (Turkey)
2nd VP: Terence Sim (Singapore)
Secretary: Arjan Kuijper (Germany)
Treasurer: Bob Fisher (UK)
- A new Standing Committee on Equality, Diversity, and Inclusion has been formed.
- In light of Herb Freeman's passing, a Special Committee will recommend a way to honor the IAPR's founders.
- We hope to see you in-person @ [ICPR 2022](#) in Montreal, Quebec, Canada. Register for email alerts about the conference at the
- ICPR 2024 will take place in Kolkata, West Bengal, India.
- Wear a mask. Keep your distance. Wash your hands. Stay healthy.

It is both an honor and a pleasure to be elected the next President of the IAPR by the [Governing Board](#) during its most recent meeting at [ICPR 2020](#). My long history as a member of the IAPR is most certainly one of the high points of my professional career. I have always been impressed by the collegial and collaborative culture we maintain within our community. It is also significant that the IAPR is so strongly international; this makes us truly distinctive. Our staff and our volunteer leaders are dedicated and hard-working, which gives me great confidence that we can continue to build on our successes into the future.

As I write this, the world still has some months to go before we escape from the grips of the COVID-19 pandemic. This has had a huge impact across all aspects of society, including our [conferences](#) and our [member societies](#). Many of our colleagues have suffered personally as well.

Through my previous role as IAPR Treasurer, I believe the IAPR will make it through the current challenge in solid financial shape. This is thanks to the tremendous efforts and creativity of our volunteer leaders who have been busy adapting and re-organizing their IAPR events to cope with the new constraints. Even after vaccines become widely available, it will take some more time, maybe several years, for the world to recover back to "normal." I expect we will see many of our conferences transition from fully remote to hybrid mode for a while, with both local participants and also remote ones. Some of the experiments we have tried during the pandemic have sparked good ideas we may wish to continue, even after COVID-19 is over.

Beyond dealing with the COVID-19 situation, we have a pressing need to continue advancing the stature and reputation of our scientific meetings. Our research is among the most important and influential of any discipline, and it is vital that we communicate this to all interested parties. We want IAPR meetings to be the preferred venue for our colleagues to publish their best work, for students to grow and learn about the community, and for our industry partners to turn when they are looking for collaborators or recruiting new employees.

We must also make significant strides in our diversity and inclusion efforts. We pride ourselves on being an open, international research community, but this also

means raising the level of participation by members of underrepresented groups in our field. For this, I applaud the efforts of our new [Equality, Diversity, and Inclusion Committee](#) and look forward to working with them to transition their ideas into practice.

As we move toward safer, happier times, I encourage you to continue to build on your own involvement in IAPR activities. There are many opportunities, and we are always on the lookout for good ideas—let me know what you think!

For now I will highlight just a few. Check out our numerous [IAPR Technical Committees](#) and sign up for the mailing lists of the ones you find interesting. It costs nothing, and you may very well make new connections that will help you advance your own research. If you are already involved in a TC, now is a good time to reach out to the TC leadership to volunteer to help. If you are like me, you will find it to be a valuable and gratifying experience. If you are looking for a research area where we do not

currently have a TC, let us know—we are always on the lookout to start new ones. Finally, make sure you tell colleagues and students who are not yet members about the IAPR, and point them toward a [member society](#). Also, be sure to look for opportunities to nominate deserving colleagues for [IAPR Awards](#).

As the next ExCo starts its work, I close by thanking our past members for their many years of dedicated service to the IAPR: Simone Marinai (Past President) and Alexandra Branzan-Albu (past First Vice President).

Our new ExCo consists of Lale Akarun (First Vice President), Terence Sim (Second Vice President), Arjan Kuijper (Secretary), Bob Fisher (Treasurer), and Apostolos Antonacopoulos (Past President). We continue to be served by the first-rate IAPR staff of Linda O’Gorman (Secretariat) and Ed Sobczak (Technical Officer/Webmaster). I very much look forward to working with them and you as we advance the IAPR into an ever better and brighter future.

IAPR Then and Now... 42 Years Ago
From the *IAPR Newsletter* Volume 2 No 1, February 1979

PRESIDENT'S CORNER

It is with a good deal of soul-searching that I have accepted the presidency of IAPR for the next two years. It is a responsibility one cannot take lightly, and, of course, it will also involve a lot of work. I deeply appreciate the trust expressed by the IAPR Governing Board in electing me. King-Sun Fu's achievements in welding the international pattern recognition community into a cohesive organization, first as chairman of the Standing Committee and later as first officer of IAPR, speak for themselves. We all owe him much for this, and I hope that he will continue to provide his help and counsel in the future.

Within a little over a year, IAPR has grown into an association of 13 national societies. This number may well double by the time of the next international conference in 1980. We are now looking forward to regular quarterly publication of our newsletter and to make the newsletter a valued medium of information exchange in the pattern recognition field. We shall, of course, need your help in this; the newsletter editor can only do a good job if you bring all pertinent news items to his attention.

Those of us who were in Kyoto for the 4th International Conference on Pattern Recognition came away from it with a feeling that pattern recognition has now without doubt become a major scientific/engineering discipline. The conference was the biggest and best ever. The quality of the presented papers, the diversity of the applications discussed, the number of attendees, and the level and excitement of the innumerable corridor and lobby discussions were impressive. A special vote of thanks is due the organizers for creating such a successful conference.

In spite of the high costs of current-day travel, a good many people from all over the globe managed to get to Kyoto and interact with their colleagues. Now we look forward to 1980 in Miami Beach. The organizing committee there will face a real challenge in trying to improve on the Kyoto Conference.

IAPR is still a young association. We need your help in improving its organization, formulating our long-range plans and meeting our objectives. Your officers welcome any suggestions you may have.

Herbert Freeman

Remembrances of Herbert Freeman

Editor's note:

In this section, we compile remembrances from some colleagues and friends of Dr. Freeman, beginning with an excerpt from Prof. Kim Boyer's remarks on Dr. Freeman's passing at ICPR2020. The remarks can be viewed in their entirety [here](#).

~ Jing Dong, IAPR Newsletter Editor-in-Chief

[Prof. Boyer began with]

"I have the sad honor of offering some remarks on the passing of Dr. Herbert Freeman, who left us just a couple of months ago.

"I will not dwell on his technical accomplishments because I think that many of you will know what those are, but rather some more interesting background material. And I do this with some humility, because I realize that many of you out there knew Herb longer and presumably better than I did, although I knew him for over 30 years, and certainly considered him a friend. But I never had the opportunity to work with him on a committee or anything like that, although I very much would have liked that.

"Herb was born Herbert Freimann in Frankfurt, Germany, in 1925. Friemann translates to English as "free man". His parents and his brother Henry emigrated to the United States in 1936. The entire family was attempting to get to the United States at that time. They were Jewish, and being Jewish in Germany in 1936 was not very pleasant, to put it very mildly. But Herb was denied a visa owing to a tuberculosis diagnosis. Now, it's understandable at that time, given medical technology of the day, why



Dr. Herbert Freeman

b. 13 December 1925, Frankfurt, Germany
d. 15 November 2020, New Jersey, USA

- Engineer
- Scientist
- Teacher
- Advisor
- Entrepreneur
- IAPR Founder
- Polymath
- Colleague
- Friend
- Gentleman

someone with tuberculosis might be denied an entry visa.

"There's just one problem, Herb didn't have tuberculosis. Never had tuberculosis. It was never clear whether that was an honest mistake, that someone didn't then want to own up to or some other more nefarious activity was going on, but his parents and his brother, his older brother Henry, got visas to enter the United States and Herb did not.

"He was about ten years old at this time. He had to stay behind. The family chose to go and leave him with relatives and attempt, have him run the test again and so on. They simply could not get a visa out of the consulate in Germany, so they requested permission for him to travel to another country, Switzerland in that case, to try to get the visa from there. That's not normally the way it works; normally, you'd get the visa from the consulate in the country from which you are emigrating, but there was a letter-writing campaign

to the U.S. State Department, which included three letters from Albert Einstein (uh, yes, that Albert Einstein!), requesting permission for him to travel to Switzerland.

"He then did that, bounced around with friends in Switzerland and so on, eventually got the visa in 1938

and was able to join his family on this side of the Atlantic. But I want you to reflect for just a moment on what that must have been like: he's ten, eleven years old; his family is already on the other side of the ocean; he's bouncing around between relatives and friends he doesn't know very well; he's in another country by this point. This takes some resilience. This, I think, if it didn't forge his character, it certainly was an indication of his strength of character."

[and Prof. Boyer ended with]

"And what I want to close with is this thought. That while we'll all miss him, of course, he leaves this wonderful legacy. We're all here today—or where we are today, virtually here—in large part because of the efforts of Herb Freeman, and we should be enormously grateful for that. And we should all celebrate a life that was long and fruitful and was so very well and productively lived.

"Godspeed, Herb."

Remembrances of Herbert Freeman

My first solid memory of Herb Freeman is his foresighted survey of the emerging field of computer graphics at the 1966 Pattern Recognition Workshop in Puerto Rico. That is where we discovered our shared love of walking and maps.

Then, in 1969, he surprised me with an invitation to give a lecture on OCR at a seminar that he was running in NYC for working engineers. A decade later, at a NATO Advanced Study Institute in Maratea, he introduced me to the lively Italian pattern recognition community.

Still later, he invited me to work with him at Rensselaer Polytechnic Institute. But by the end of the two years it took for my move from the University of Nebraska, he had decided to join Rutgers University, near the homes of his children and grandchildren. So I inherited only his office with the No Smoking sign, his course on Computer Vision and Robotics, and his student Junichi Kanai (now a Professor at RPI).

When I visited him at Rutgers, he showed me the building that he had raised for the Center for Advanced Information Processing (CAIP), and some challenging examples of map label placement. At one of the conferences where we usually met, Herb chided me for not wearing a necktie.

At the next conference, I caught him open-collared. He said "Times change!" He kept up better and longer than most of us.

*George Nagy, PhD '62 (on neural networks)
Fellow of the IEEE and the IAPR
Professor Emeritus, Rensselaer Polytechnic Institute*



I first met Herb Freeman around 1970 during the time I was on the faculty of the University of Kansas. I had already met K.S. Fu, because we gave papers at remote sensing conferences. And I knew Azriel Rosenfeld from 1968 when I began my research on image texture analysis

It must have been one of the IEEE conferences that there was a small committee meeting to discuss pattern recognition conferences. It may have been organized spontaneously. It was Azriel Rosenfeld who invited me to attend. It was at that small meeting that I first met Herb Freeman whose papers I was already familiar with.

Being a young researcher I was more of an observer than a participant. But I watched as these giants in the pattern recognition field discussed conferences. I remember Herb Freeman discussing working with IFIP. I remember the precision of his ideas and how he spoke.

He constantly emphasized involving the European community. That really impressed me. He really understood how to bring into existence international conferences and international organizations. I remember thinking how much he knew about organization formation.

It seems that nearly every year we met at a conference. It was not until the third ICPR conference that I gave a presentation at ICPR. He was there. Then we met at every ICPR conference as I was one of the American representatives to the IAPR governing board.

He was always so kind and encouraging. We talked about what each of us was working on.

Once he retired we had little contact. I always have had an enormous respect for who he was as a person, his research contributions and his leadership. He is missed.

Robert Haralick

Remembrances of Herbert Freeman

I first met Herb when I was a graduate student in Azriel Rosenfeld's lab in the mid 1970's. Herb gave a talk about digital shape analysis - Herb's talks were always precise and clear.

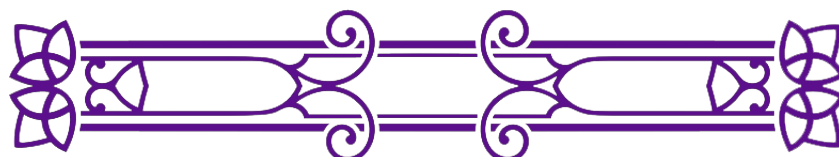
Herb spent a part of a sabbatical in our Picture Processing Lab, and I collaborated with him on a research project. The resulting paper, "A corner finding algorithm for chain-coded curves" was published in the IEEE Transactions on Computers in 1977 and remarkably is still being cited in 2020!

Recently, in 2014, Herb visited Maryland to speak at a workshop celebrating the 50th anniversary of computer vision at Maryland (and the 10th anniversary of Azriel's passing). Herb sent me a package of materials from his "scrapbooks" (his term!) about Azriel. It included a photograph of an early edition of the journal "Computer Graphics and Image Processing" (now CGVIP) that was started by Azriel, Herb, the late Tom Huang and Andy van Dam from August 1972 - the field's first journal on these subjects - and programs for summer schools that Azriel and Herb organized in New York in the early 1960's on problems in digital picture processing. Herb gave a wonderful, personal talk about his relationship with Azriel - and the day before the symposium he gave a clear technical talk to our lab about his work on map symbol placement.

Azriel passed away in 2004, and I wrote to Herb to ask him if he would write a tribute article for Azriel for the IAPR newsletter. Herb wrote back to me saying "I knew Azriel since 1962 - this role seems always to be falling to me - first K. S. Fu (the founder of the field of syntactic pattern recognition from Purdue), then J. C. Simon (J.C. was a French professor who owned a chateaux in the south of France that housed wonderful summer NATO Advanced Study Institutes that Herb and I attended) and now Azriel. Who will write for me when I am gone?"

Well, we are all writing for Herb now that he, too, is gone. Herb was a pioneer in the field of "digital picture processing," an outstanding professor and mentor to me and especially his students, and a thoughtful and empathetic human being.

Larry Davis



In the mid-1970's I was a Postdoctoral Fellow working with Azriel Rosenfeld on relaxation labeling. Azriel and Herb were close friends, early founders of the field of image processing. So Herb was a visitor on many occasions. He talked about computer friendly representations of image contours ('chain codes'), but I was motivated by how brains might represent contours. My initial impression of Herb was as an engineer, formal in his thinking, getting the details right, driven by applications. We didn't interact very much.

It wasn't until a year later, at the 1976 NATO Advanced Study Institute on Image Processing, in Bonas, France, that Herb and I met again, and I had the time and proximity to discover how broad, deep and intricate Herb's thinking was. His focus on detail was in seeking clues for the bigger picture, not just in his work but in everything he did.

Nowhere was this more humanely expressed than, when we drove around the south of France, Herb illuminated the landscape with anecdotes and history about World War II, transforming maps and roads into the story of peoples, their trials, and their origins. It made a great impression on me, and, certainly many others.

That's the kind of person Herb was.

Steven Zucker

Remembrances of Herbert Freeman

My Characteristic View of Herb Freeman

Walter G. Kropatsch

January 3, 2021

Gabriella Sanniti di Baja invited several colleagues who knew Herb Freeman to contribute to a special issue of the IAPR Newsletter, **'In Memoriam Herb Freeman'**. I have chosen one of Herb's key contributions in the title of my contribution: "characteristic view". As defined in [1] characteristic views factor **'the space of all possible perspective projections of an object into a set of characteristic views, where each such view defines a characteristic-view domain within which all projections are topologically identical and related by a linear transformation.'** Relaxing a little the rigorous definition, a characteristic view of a person's life summarizes my memory of Herb that somehow characterize him and his scientific contributions from the view point of an observer. It may remind others who knew Herb about important events related to him, and could probably stimulate and motivate the younger generation to contribute in the spirit of the past to the benefit of the whole IAPR community.

I was a PhD student when I met Herb for the first time at the Advanced Study Institute (ASI) on "Map Data Processing" in Maratea, 1979. It also was my first professional adventure to travel alone to an unknown place in southern Italy. But the organizers of this workshop, Herb Freeman and Goffredo Pieroni, provided helpful information. So I could manage to find Maratea and the location of the workshop. The topic of this workshop was closely related to

my PhD-work on Registration of Satellite Images with Maps. It was a "small" workshop with about 50% established researchers (Herb Freeman, Azriel Rosenfeld, Larry Davis and Joan Weszka, Stefano Levialdi, Bob Haralick and Linda Shapiro) and 50% novices. The workshop was excellently organized in a very friendly atmosphere enabling contacts among all participants. Herb Freeman was present during the whole workshop and helped the participants in the rare cases where they needed help.

There were talks in the morning, long lunch break with opportunity to establish contacts, afternoon presentations, and an evening program with further possibilities for networking. I liked it so much that I participated to two more such ASI after the first experience. I learned from this meeting what are important organizational issues. Later I integrated them in my own meetings like the yearly 'Computer Vision Winter Workshop' (CVWW) jointly organized by groups in Austria, in Czech Republic, and in Slovenia.

1981, I had the opportunity of a round trip through USA related to the topic of my PhD and a current project. My first stop brought me to the lab of Herb Freeman, the Rensselaer Polytechnic Institute (RPI) in Troy. I still remember the flight from NY to Troy in the smallest airplane I ever flew. I was then happy to land in Troy and was brought to my Hotel in the car of one of Herb's students, Michael Potmesil. Next day,

I had a warm reception by Herb in the lab and was invited to participate in the weekly *jour fixe* where all students reported on the status of their current research, a model that I took over in my group at PRIP/TU Wien and that we practice until now. In the afternoon, I had further individual talks with PhD students of Herb: Michael Potmesil, Indranil Chakravarty. Next day, Herb even invited me to join him and his wife to drive in his car to NY from where I continued my trip to Vicksburg, Mississippi, for a project meeting. The tour brought me further to San Francisco (SRI, visiting Martin Fischler), Los Angeles (USCLA, Keith Price, Ram Nevatia), and to Maryland (CfAR, Azriel Rosenfeld, Hannan Samet, Larry Davis...). During this trip I personally met many top scientists in the field of pattern recognition and computer vision. This fact certainly had a great influence on my further scientific career.

1982 was the year where I participated in my first ICPR in Munich. I have been asked to participate also in the IAPR Governing Board meeting, because Austria applied for membership to the IAPR. It was Herb Freeman (IAPR Treasurer at that time) who presented the motion to the GB, because I did not have a written document to represent Austria. It was Azriel Rosenfeld who was IAPR president at this time to finally approved Austrian's membership to IAPR.

In 1983 Herb organized another ASI on Computer Architectures

Remembrances of Herbert Freeman

for *Spatially Distributed Data*, this time in Cetraro, not too far from Maratea. I was pleased to be accepted and to present part of the work of my PhD.

Freeman's chain codes fascinated me when I learnt about them and by their possibility to combine formal grammars with digital images. It was known at that time that a straight line is described by only two codes of which one can appear repeatedly and the other only as a single code. In the CVGIP paper [2] we extended these observations into a complete description of digital straight lines by imposing the above constraints recursively also to the run length codes of the repetitions.

The ICPR in Atlantic City (1990) was organized by Herb Freeman as General Chair. It was my first conference as newly appointed professor at TU Wien. Six years later (1996), I was general chair of the ICPR in Vienna, Yiannis

Aloimonos was the program chair. Teuvo Kohonen won the King Sun Fu prize and gave an excellent presentation in the golden hall of the Musikverein in Vienna (this is the location where the New Year's concert takes place every year on January 1st). After the banquet at the city hall of Vienna, Rama Chellapa organized a panel with Herb Freeman, Azriel Rosenfeld and Laveen Kanal.

I regularly met Herb at ICPRs (he was proud of being the one that participated in all ICPRs, as I am proud of not having skipped any ICPR since 1982). I became a messenger between him and Heinz Zemanek known for the first computer built in Austria: Mail'ufferl. They both knew each other from their activities in IFIP, and I somehow got the role to transmit greetings from Heinz to Herb at the occasion of the biennial ICPR and from Herb to Heinz at the occasion of meetings

of the Austrian computer society. During the last years Herb did not travel so much and some of the contact was with email.

Since my first meeting with Herb more than 41 years passed by and I always had good talks with him. I learned a lot from how he organized meetings, and I still like the clarity of his papers. I now consider my role of messenger as finished and wish that Herb and Heinz continue their friendship in the virtual space.

References

[1] Indranil Chakravarty and Herbert Freeman. Characteristic Views as a Basis for Three-Dimensional Object Recognition. In *SPIE Proceedings of the Conference on Robot Vision*, pages 336:37–45, 1982.

[2] Walter G. Kropatsch and H. Tockner. Detecting the Straightness of Digital Curves in $O(n)$ Steps. *Computer Vision, Graphics, and Image Processing*, Vol. 45(No. 1):pp.1–21, January 1989.



I am honored to write this memorial to Herb Freeman, z"l, a Holocaust survivor who emigrated to the United States in 1939 from Germany.

Herb was the epitome of a gentleman, and a leader who projected honesty, knowledge, organizational skills, and directness. I first met him when I was a young professor at McGill University. Herb had been very active in the IAPR and was the president at the time that I was "making my way up the academic ladder". As I became familiar with the Pattern Recognition crowd, we spoke frequently. On one occasion he asked me whether I would be interested in becoming involved in the functioning of the IAPR. (At that time, there was only one other researcher in the field in Canada!) I agreed, and the rest is history. A serious scientist, Herb was always available for discussions and advice. He was an outstanding role model and I honor his memory.

*Emeritus Prof. Martin D. Levine
McGill University
Montreal, Canada*

Remembrances of Herbert Freeman

Herb Freeman: In Memoriam

by Hanan Samet

Herb Freeman was a great scientist of the “old school” who accomplished much in his long and distinguished career, having made significant contributions in, to name a few, image processing, computer graphics, pattern recognition, and map data processing. I say “old school” on account of the diversity of his work instead of the current over-specialization that is prevalent in our discipline. For example, he is credited with inventing the Freeman chain code for encoding the boundaries of regions, in binary images. He also wrote a classic book consisting of a Tutorial and Selected Readings in Interactive Computer Graphics. It often served as the principal text for graphics courses in the early days of the field.

Later on in his career, he focused on map data processing known today as geographic information systems (GIS), where he was already well-known for his work on the Freeman chain code. He developed an AI-based approach using expert systems that yielded an elegant method for labeling maps based on a number of classic cartographic rules of aesthetics that served as constraints. This work was revolutionary and was used extensively by many organizations including the US Census Bureau and Lufthansa Airlines. This work was so successful that Herb founded a startup named MapText

to commercialize it. In fact, after his third “retirement” (the first two being RPI and Rutgers), Lufthansa bought the company to ensure the continued existence of the technology. Herb was very proud of this work and was invited often to speak about it all over the world. In fact, I remember Herb shopping the company to his colleagues (including me), pitching it as a promising business opportunity.

My connection to Herb was made through my work with Charles R. Dyer and Azriel Rosenfeld on converting quadtree image representations to Freeman chain codes and vice versa. Herb liked my work which led to the development of a nice professional relationship whose common thread was our enjoyment of travels to Italy as well as to Switzerland to participate in professional activities. This also led us to meet on visits to other places such as the beach in the Copenhagen area which was captured by Gabriella Sanniti di Baja in a photo that pictures the three of us on the sand. One of my most vivid memories was Herb's constant claim to his hosts that he was a vegetarian, which surprised me, and when I pressed him on this, he responded that this helped him avoid dietary issues such as pork and shellfish which he would not eat on account of not being Kosher.

Over the years we used to meet several times per year, especially every two years at the ICPR Conferences, which were held in nice venues all over the world.

We last met in November 2014 at the 50th Anniversary of the University of Maryland's Computer Vision Lab to which he drove with his wife Joan and daughter from New Brunswick, New Jersey, on a Sunday and drove back in the afternoon on the next day, as he wanted to avoid driving in the dark. I did not appreciate the reason for the caution, but understand it well now given the passage of six years. This was typical of Herb's understanding of risk especially as he was approaching his 90th birthday while stopping skiing not too many years before. Of course, there was the trauma, fortunately only temporarily, of having been left behind in Germany, when his family fled the Nazis to America.

The best way to describe Herb is as being multidimensional. He was a “Gentleman Scholar”, but he was also a successful entrepreneur in commercializing the results of his research, relatively late in his career, something I greatly admire.

To me, and to many others in our discipline, he is a great role model.

We will miss him.



Remembrances of Herbert Freeman

My earliest memory of Herb Freeman is the time he invited me to participate in a NATO Advanced Study Institute on Map Data Processing in Maratea, Italy, in June of 1979. I was a young assistant professor, had never been to Italy, and had no idea where Maratea was.

We arrived at the Rome–Fiumicino International Airport with the usual jetlag, got our bags and waited outside, but for what? Pretty soon a big van drove up with Herb driving it, and he personally drove us from Rome to Maratea, which is south of Naples and in a beautiful location that he had chosen. I slept through the whole ride, but the workshop itself was well-planned and memorable.

I've always liked both Herb Freeman and Italy.

Linda Shapiro

IAPR Then and Now... 42 Years Ago
From the *IAPR Newsletter* Volume 2 No 2, June 1979
Martin D. Levine, Editor

NATO ADVANCED STUDY INSTITUTE MAP DATA PROCESSING Maratea, Italy - 18-29 June 1979

A Nato Advanced Study Institute (ASI) on the subject of map data processing will be held in Maratea, Italy 18-29 June 1979. The objective of the ASI is to further the dissemination of knowledge in computer cartography and those areas of computer graphics, image processing, pattern recognition, and software engineering that impact on map data processing.

The ASI will consist of tutorial lectures and panel discussion sessions. Ample time will be provided for informal discussions among the participants. The lectures will cover both underlying principles and techniques as well as recent research results and applications. Major topics are:

- * map data representation
- * conversion of map data
- * data structures for map data processing
- * management of Large map data bases
- * algorithms for map data analysis
- * software systems for map data processing
- * applications involving geographic map data
- * applications involving thematic map data
- * applications involving biomedical map data

No registration fee is charged to accepted applicants. A limited number of NATO grants are available for partial travel support. Persons interested in participating should at once contact either of the ASI co-directors:

Professor H. Freeman
Computer Engineering Program, Rensselaer Polytechnic Institute
Troy, New York 12181 U.S.A.

Professor G.G. Pieroni
Dipartimento di Matematica, Università della Calabria
Rogge di Rende, Cosenza 87030 Italy

Remembrances of Herbert Freeman

I met for the first time Herbert exactly forty years ago, on the occasion of the first ICIAP here in Pavia in October 1980, where he gave an invited lecture on one of his preferred topics "Comparative map data encoding techniques". This was a very successful edition also for the rich sequence of activities between us that started with that meeting. Not only did he contribute as an invited lecture in at least four over the twenty editions of ICIAP, but also we started many exchanges between our Institutions, and for many years also effective NATO Collaborative Research in the topic of "Multiresolution techniques for high-speed machine vision".

I want to mention the sabbatical period I spent at the CAIP Center at Rutgers in 1987. I still remember my arrival and how Herbert received me with his "welcome in New York!". Sincerely, I consider Herbert one of my main "magisters", certainly he has been the one that introduced me to the international pattern recognition organization. All my family remembers our stay there, his support for the housing, for the children's school, and overall, the opportunity given to me to cooperate in the development of the proposal to NSF of a multiresolution chip for image processing. Later, I personally met Herb on a few occasions, and from time to time we wrote to each other and exchanged some ideas about the activities of the pattern recognition society and research.

The last time we met Herb and Joan together was here in Pavia, June 1996, on the award of the 'Medaglia Teresiana', and I remember in the teaching room of Alessandro Volta, our Rector motivation: "in recognition of his fundamental and pioneering contribution I am very pleased to honor Prof. Herbert Freeman the highest honor the University of Pavia goes to outstanding personality of culture and sciences".

A colleague of Pavia University wrote a book entitled "travel friends" on the personalities that inspired his life. I sincerely consider Herb one of the best travel friends of my life!

*Virginio Cantoni
Professor Emeritus of Pavia University
IEEE Life Fellow and IAPR Fellow*



It was 1982. I had just joined Pennsylvania State University as an assistant professor. My first task was to find a new topic for my research program. I had just taken a road trip to Philadelphia, time-sharing my driving task with navigating the route using a traditional paper map on the dashboard. I thought it would be a nice new research topic to teach a computer to read and understand a paper map and direct us to our destination. While researching this idea, I learned that Professor Freeman had organized a NATO Advanced Study Institute on Map Data Processing a few years earlier in Italy! The well known Freeman Chain Codes, as a compact and efficient data representation scheme for maps and other line drawings, was presented at that event.

It was an honor to meet Professor Freeman in person at the Seventh ICPR in 1984 in Montreal where I had my first paper on map processing. Since then I had looked forward to meeting him at ICPRs every two years. His work influenced much of my work in line drawing processing for over thirty years. In 2008, when our university hosted the ICPR in Tampa, Florida, it was our pleasure to invite Herb and other KS Fu award winners. I think that was the last ICPR that he attended.

Rangachar Kasturi

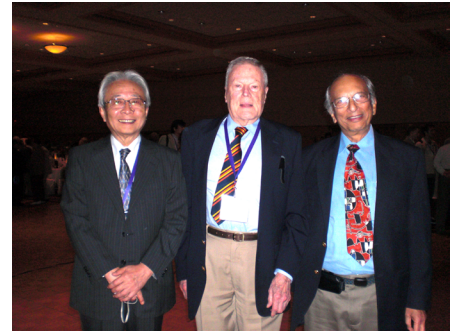
Remembrances of Herbert Freeman

My Memories of Herb Freeman

It is an honor to have known and interacted with Dr. Herbert Freeman. I cannot quite recall where and when we first met. However, I can say with certainty that we knew each other for a long time! I distinctly recall that we met at numerous ICPRs and other conferences and workshops. At one of the ICPR meetings, I was offered the position of Treasurer of IAPR. It was Herb who convinced me to accept that honor and job! From then on, I was hooked by IAPR, and Herb and I met quite often. At the same time several other happenings brought us closer together.

As Gabriella mentioned in her writeup, Herb invented the Freeman Chain Code to describe line diagrams. My student James Mckee used it to describe and recognize hand tools. That paper appeared in the Pattern Recognition Journal and won James and me the Best Paper Medal and Cash Award. The Freeman Chain Code proved useful in several other applications.

While Herb and I attended the technical sessions at meetings, Joan and Shanti became acquainted with each other while sightseeing, and we all got together at conference dinners, and other functions. So, in addition to being colleagues we became very good friends. The two pictures show Joan Freeman, Shanti Aggarwal and Kieko Ejiri, and the other picture shows Masakazu Ejiri, Herb and Jake from ICPR 2008.



Another important happening in 1992 brought Herb and me even closer. After graduating from Carnegie Mellon University, my daughter Mrs. Malini Aggarwal Ireland joined a company in Princeton, NJ, for her first job. I was obviously very proud but also very apprehensive as she would be on her own and alone for the first time. However, the thought of Herb being nearby made me happy and less concerned. From then onwards, whenever I visited my daughter in Princeton, I visited Herb and we had dinner together with our wives. We invariably went to the same restaurant (Carlucci's) and had almost same dishes every time.

This was like a ritual. The last time we had dinner, we took a photograph for posterity.

As Gabriella mentioned, Herb received the K S Fu award in Jerusalem, ICPR 1994. I was the President of IAPR at that time, and it was my distinct honor to present this prestigious award to Herb.

Herb told me on several occasions that I should retire in Princeton, and be near him in the retirement community he lived in. I told Herb that NJ was too cold for me, but I enjoyed our visits very much. I shall miss him.

*J. K. Aggarwal
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Remembrances of Herbert Freeman

The IAPR Then and Now...26 Years Ago

"Herbert Freeman has retired from active service in IAPR"

the *IAPR Newsletter* Volume 16 No 4, July 1994, Maria Petrou, EiC

Layout Editor's note:

This "retirement from active service in IAPR" lasted until 2004, when Herb accepted a position on the IAPR's Advisory Committee, on which he served from 2004-2010, chairing it for the 2008-10 term.

Linda O'Gorman, IAPR Newsletter Layout Editor

IAPR Newsletter Volume 16 Number 3 - Page 3

NEWS OF MEMBERS

Herbert Freeman has retired from active service in IAPR

It is very difficult to write something on Herbert Freeman without going through the history of IAPR! He was there, at the conception of the IAPR idea, as a founder member, and he is still here now that IAPR has grown to be one of the largest organizations of its kind, as an ordinary member, having served in many of its posts, including the post of President (1978-80).



IAPR was conceived in 1972 in the "Pattern Information Processing" conference at Airlie House in Warrington, VA and a standing committee was set up to promote the idea. From that time and until 1976 Herbert Freeman served as Joint Vice Chairman (with C K Chow) of the "Standing Conference Committee for the International Joint Conference on Pattern Recognition", as it was called, and helped organize three such conferences until the committee was officially replaced by the formal organization of IAPR in 1976. K S Fu was elected the first Chairman of the new organization and H Freeman its first treasurer, a position which he held for four terms, until 1988. As IAPR's Treasurer, in 1985, following the death of K S Fu, he arranged the setting up of the K S Fu award and conducted the fund raising for a permanent financial backing for the award. But before that point was reached, IAPR needed a lot of devoted care in its infancy!

Back in 1976, Herbert Freeman played an active role in preparing the IAPR Constitution and Bylaws with C Verhagen, on the model of the Constitution and Bylaws of IEEE Computer Society and IFIP (International Federation

for Information Processing). He actually became Chairman of the Constitution and Bylaws committee in 1976 and remained in that position until 1986. He also handled the incorporation of IAPR as an educational scientific organization under the laws of the state of New York and arranged for the recognition of IAPR as a tax exempt organization and as an organization recognized to receive tax exempt gifts and donations. With his suggestion IAPR became a member of IFIP, where he had been active since 1962. Herbert Freeman served as the IAPR delegate to the Federation from the beginning until 1988.

As Chairman of IEEE Computer Society's Technical Committee on Machine Intelligence and Pattern Analysis, he lobbied the Computer Society to become the USA representative to IAPR and in collaboration with K S Fu arranged a new Computer Society Transactions that came to be known as PAMI. He was one of the four IEEE Computer Society's governing board members to IAPR and held that position longer than anybody else, for 14 continuous years until 1992.

Herbert Freeman served several times on the organising committee of ICPR and proudly claims that he has attended every single ICPR! Now he has retired from active service, we are all grateful for his major contributions and wish him many more happy ICPR participations!

ICPR 1998 CALL FOR PROPOSALS

The Executive Committee of IAPR is soliciting proposals for the venue of the 14th International Conference on Pattern Recognition in 1998.

Previous and upcoming ICPR venues:

- 1990 Atlantic City, NJ USA
- 1992 The Hague Netherlands
- 1994 Jerusalem Israel
- 1996 Vienna Austria

For details on the information content of proposals, please contact the IAPR Conferences and Meetings chairman:

Professor Walter Kropatsch
Institut für Automation 183/2
Dept for Pattern Recognition & Image Processing
Technical University of Vienna
Treitlstrasse 3/1832
A-1040 Vienna Austria

Tel: +43 1 588 018 161
Fax: +43 1 569 697
Email: krw@prip.tuwien.ac.at

Remembrances of Herbert Freeman

In 1997 at the age of 72, Herb founded the computer graphics startup MapText. Herb invited me down to tour the site. From my own experience, startups are all-consuming, and I wondered why a successful professor would swap for this arduous new life. I found the reason in the cramped MapText offices. The employees were all young and full of enthusiasm for the technology that Herb had created. I spoke with Herb at an ICPR a few years later when he was in the process of selling the company. Impressively, he had guided it to success both as a technology and a business, and indeed the company offers graphics solutions for map creation to this day.

Larry O'Gorman

The IAPR Then and Now... 17 Years Ago

From
the *IAPR Newsletter*
Volume 25 No 4,
September, 2003
Larry O'Gorman, EiC

INTERNATIONAL ASSOCIATION FOR PATTERN RECOGNITION

IAPR Newsletter

Volume 25 Number 4
September 2003

Pattern Recognition in Maps

Here's the problem. You are in a small-engine plane flying in northern Canada. Visibility is poor. You're close to the magnetic north pole, so your compass is useless, but you do have a radio altimeter and a barometric altimeter. The difference between their readings is the elevation of the terrain below your flight path. And, you have an elevation-contour map. Now, navigate to a specified location.

In 1966, Herb Freeman and graduate student Steve Morse tackled this problem by applying pattern recognition methods to maps. Neither Herb nor Steve ever got into a plane to try out their methods but the results were well received. (Cold War spy reports had it that submarines used the method to navigate via the contours of the ocean floor.)

In the years that followed, Herb worked on many other pattern recognition tasks (including automatic reading of the license plates of passing cars), but often returned to those involving maps. Although map production became increasingly more automated, two tasks eluded computer cartographers. One was "generalization", generating a small-

scale map from one of larger scale by eliminating less important features and simplifying those that were retained. The other was text placement, the labeling of the point, line and area features. Herb and Ph.D. student John Ahn took on this latter task and, after a couple of years, presented the results at a conference in Ottawa in 1983. When the audience of pattern recognition experts, geographers, and cartographers applauded upon seeing the automatically labeled maps, Herb and John knew they were on to something.

The Natural Resource Conservation

Service (NRCS) of the US Agriculture Department, which maintains soil maps of the US for use by farmers, developers, and road builders, is one of the largest mapmakers in the world.

Still, in the late 1980s, all of their maps were labeled by hand, though not for lack of attempts at automation. Contracts had been awarded to a number of companies but all had failed. In Herb's words, "The problem was perverse. There are problems that look easy and are easy. Other problems look difficult

(Continued on page 4)

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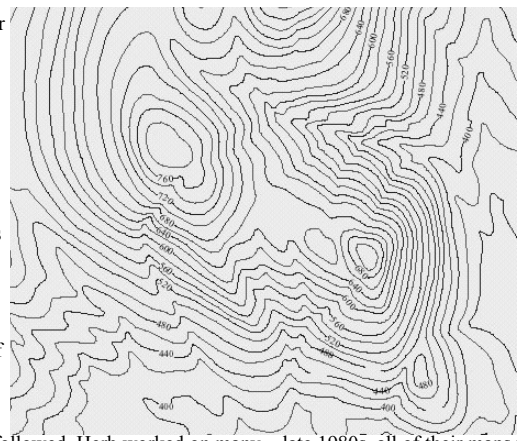
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Remembrances of Herbert Freeman

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The IAPR Then and Now...17 Years Ago From the *IAPR Newsletter* Volume 25 No 4, September, 2003 Larry O'Gorman, EiC

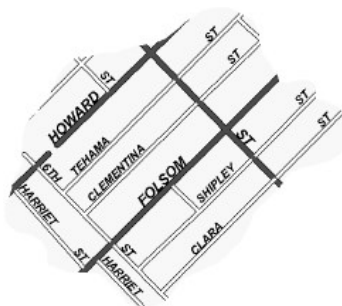
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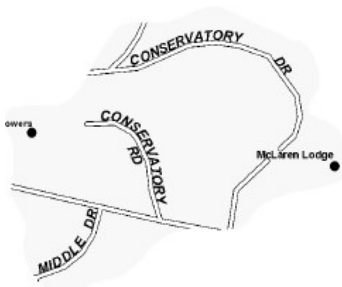
and are difficult. But the automatic labeling problem is perverse because it looks easy but is frightfully difficult." Knowing of Herb's research experience in the area, first at Rensselaer Polytechnic Institute, then at Rutgers University, the NRCS decided to award a contract to his group. A couple years later, the group delivered fully functioning software, ALPS (Automated Label Placement Software), for the automatic labeling of soil maps. This marked the end of hand-labeled soil maps.

It was another US government agency that ultimately pushed this technology to market. In the mid-1990s, the US Census Bureau was preparing for the 2000 census. They approached Herb about developing a system for the automatic labeling of census maps. This would be a huge undertaking, but more worrisome was the unyielding deadline. Herb's Rutgers group accepted the challenge and managed to prove technical feasibility by 1997. Technical feasibility was only part of the solution. It was obvious that a task on which the success of the entire census might depend could not be left to a group in academia but required the commitment only a commercial company could provide. This was the genesis of MapText, Inc. Herb retired from Rutgers and started the company in 1997. Their first contract was from the Census Bureau, and, before the deadline year, 2000, their software had successfully placed the text for over 20 million maps!

Map-making and labeling combine many technical fields such as expert systems, pattern recognition, database technology, image processing, visual perception, optimization, and human interface design. Along with the science there is also an art that is necessary to create maps that both efficiently convey information and are visually



pleasing. Of course, the primary labeling rule is to not overlap labels. But avoiding overlap is only one of the text placement issues. Text must be placed to conform to the



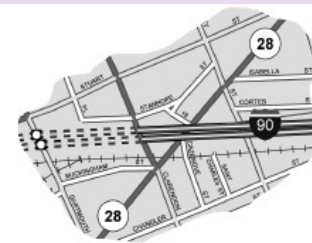
curvatures of a winding road. It must span the extent and conform to the shape of a large area. And it should always be clear to what feature a label refers. All these cases must be handled, while maximizing the precision of placement, respecting the underlying geography, and achieving placements that are visually easy to comprehend.

MapText's software recognizes that map reading also has a subconscious component. Swiss cartographer, Eduard Imhof, wrote the "bible" of map labeling in 1942. He wanted map labels not only to identify individual geographic features but also to be intuitive. Here are some examples. If a city is on the coast, its name should be placed in the water; however, if it is only close to the coast, the label should never be in the water. For a contour map, the elevation numbers should be

aligned and should read monotonically upward on the map for a mountain and downward for a crater. If a town lies on the east side of a river or highway, its name must also be placed on the east side, because the reader is more likely to remember where the text was placed rather than where the town symbol was located. For small-scale maps, such as, say, a map of North America, the constant-latitude lines are usually shown curved. In that case, the names of towns and areas should be angled to lie tangent to the curvature of the constant-latitude lines. MapText's software implements these rules plus a multitude of others promulgated by Imhof, by other cartographers, and by their own experience over the years.

Today Herb's company consists of about a dozen people, mainly software developers and computer cartographers. MapText's customers include government agencies from the US and from places as far away as New Zealand. But governments and the traditional mapmakers are not the only producers of maps. Many corporations also need maps. Parcel delivery services, real estate companies, and insurance companies are obvious ones. And MapText-labeled maps also help get your pizza to you while it's still hot. The Papa Johns Pizza restaurant chain is a user of their software.

Continuing geopolitical changes demonstrate that map-making is not a static business with respect to content. The ongoing work at



MapText shows that map technology is changing as well. So the next time you order a pizza – and it gets to you hot – you can thank the almost 40 years of work that Herb Freeman has put into maps.

[For more information on MapText, see www.maptext.com.]

Larry O'Gorman

Remembrances of Herbert Freeman

Post "retirement from active service in IAPR" activities:

Attending every ICPR until 2008:

THREE WISE MEN...



The three recipients of the King Sun Fu award in previous years: Laveen Kanal, Azriel Rosenfeld and Herbert Freeman, guests of honour at the banquet of the 13th ICPR.



Autumn 2000
Volume 22 No 4

Newsletter of the International Association for Pattern Recognition Inc.
(An affiliate member of the International Federation for Information Processing)


SPECIAL MILLENNIUM EDITION



Jake Aggarwal and Larry Davis with Shanti and Joan

IAPR
is pleased to publish
this special edition
to celebrate
the birth of the
21st Century
and
a most successful
15th ICPR

15th ICPR Barcelona
was a time to meet
old friends and to
forge new
collaborations
and friendships



Herb and Joan Freeman celebrate his attendance at every ICPR since the beginning.
Herb is, we think, the only member who can claim this record.
Unless you know otherwise?

Updating the "History of the INTERNATIONAL ASSOCIATION FOR PATTERN RECOGNITION from its founding in 1973 to 2008"

IAPR Newsletter Vol. 31 No. 2, April 2009

Letter from the President, Brian C. Lovell

"The IAPR has a long history but memories of the early years are fading, and there are few founding

members left to recall events. Through the Advisory Committee we are making a concerted effort to collect and collate this information before it is lost."

**Do you have
information about
IAPR's history?**

**Contact the
Advisory Committee**

Herb Freeman, Chair
hfreeman@comcast.net

**email fom Herb to the
IAPR Secretariat**

May 9, 2009

Linda -- As you may have heard, I am trying to update the history of IAPR. Any important (in your opinion) matters that have occurred in IAPR since 1983 would be of interest. I have some, but I am sure you have many more. If you can send these to me I'd really appreciate it. Many thanks,

Herb

IAPR Newsletter

Vol. 31 No. 4, October 2009

**News from the
IAPR Executive Committee,
Denis Laurendeau, Secretary**

"The Chair of the Advisory Committee and co-founder of the IAPR, Prof. Herbert Freeman, IAPR Fellow, kindly agreed to update the history of the IAPR. Prof. Freeman submitted a first draft of the document to the ExCo in September, 2009. The reading of this document is captivating and is definitely a "page turner" for those interested in the creation of the IAPR and in the creation of learned societies in general. This important document on the IAPR can be viewed from the IAPR web site.

Remembrances of Herbert Freeman

Very sorry to hear that Herb Freeman passed away. When I looked up, I found that he left us on November 15, 2020.

Prof. Herb Freeman was a computer pioneer who invented the Speedac computer for Sperry Gyroscope. He was engaged in computer processing of digital maps and drawings. As a professor at NYU, RPI and Rutgers, he also founded the company called Maptext, Inc. He held prominent positions at several professional societies, notably IAPR, ACM, and IEEE. For the early 70's and 80's, he was the IAPR's liason at an active IFIP (International Federation of Infomation Processing) during that time.

I invited Herb to give a seminar at our research centre (CENPARMI - Centre for Pattern Recognition and Machine Intelligence) at Concordia University about 8 years ago. He came with his wife Joan. He looked quite healty at that time and gave a lot of examples on digital processing of maps and engineering drawings. Our students enjoyed very much his talk and of course found out the early reasons for using the 4-directional chain code, subsequently also called the Freeman code, to represent the directions of digital lines and curves. From the codes, we can easily determine the curvature of lines and curves, and features like slant, cups, hats, concave and convex shapes, loops, of 2-D images. This technique leads to efficient transmission and storage of digital patterns.

We miss Herb who participated in the establishment of IAPR and ICPR. We appreciate very much his contributions to our PR Community.

*Ching Y. Suen, FIAPR, FIEEE, FRSC
Concordia University , Montreal, Canada*

IAPR Then and Now... 26 Years Ago, from the *IAPR Newsletter* Volume 17 No 1, January 1995

KING SUN FU AWARD 1994

Now, what do you call an editor who a couple of months BEFORE the decision of the K S Fu award, publishes a photo and a whole feature article about the recipient? Clever, for having predicted the outcome of the competition? Stupid, for having pre-empted herself and has nothing to write now? After careful consideration of the pros and cons, and thought given to the consequences, I decided that I prefer the first option!

Some of you now might think that my choice was not difficult! But the task of awards committees is usually more difficult. Our community has several worthy members who have offered a lot to the advancement of the field and five of them were nominated for this year's K S Fu Award. (It should be noted that no member of the Executive Committee or the Governing Board is eligible for the award and no member of the Executive Committee is allowed to nominate a candidate.) The award, which consists of a plaque and a cash prize, is given once every two years to an individual in recognition of a technical contribution of far reaching significance and impact on the field of Pattern Recognition or its closely allied fields. The undisputed winner this year was none else than

HERBERT FREEMAN

from Rutgers University, USA. There was a feature article

in the July issue of the Newsletter on Professor Freeman with the opportunity of his retirement from active service in IAPR. The article had mainly concentrated on his activity within IAPR, however his scientific offer to the community should not be underestimated. One of the most commonly used tools in shape description, encoding and recognition, namely that of chain code (often called the Freeman chain code) was proposed by him in 1959. Professor Freeman has also made significant pioneering contributions to the representation and analysis of line drawings. He has published more than 120 papers and has supervised more than 36 PhD theses! More recently, Herbert Freeman had been working on recognition and pose determination of 3-D objects, using the "characteristic-view" approach, automated cartographic name placement (automatically placing the names for area, line, and point features on geographic maps), and offline cursive hand-writing recognition in applications involving severely constrained vocabularies. Apart from his professional activities within IAPR IEEE, IFIP and other professional organizations, he has served (and still serves) on the editorial boards of many prestigious journals in our area of research. The award was only a small token of appreciation of his numerous contributions to the Community.

[Maria Petrou] Editor

Remembrances of Herbert Freeman

In 2017, I got an email that led to the publication of the "IAPR Member News" page shown below.

From Rangachar Kasturi to me:

Just saw this. You may enjoy reading it.

https://m.facebook.com/story.php?story_fbid=10213224999639495&id=1231299303

From me to Herb:

Dear Herb,
Kasturi sent this link to us. You look wonderful!

I commented at the FB page, but wanted to ask you directly if it would be okay with you if I included the photo in the July issue of the IAPR Newsletter for those who missed this post.

All the best, Linda

From Herb to me:

Linda,
Many thanks for your email. Yes, of course, feel free to include it in an IAPR newsletter (and then please send me a copy as well).

Best regards,

Herb



IAPR MEMBER NEWS

Editor's note:

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

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

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

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



Once the issue was ready for print, Herb and I exchanged these emails.

From me to Herb:

Dear Herb,
Here is a draft of the IAPR Member News page. The July issue will be published later this week or early next week.

Also, ICPR 2018 in Beijing will mark the 40th anniversary of the IAPR! Wow! For a blast from your past, I've also attached the certificate of incorporation.

Cheers! Linda

I'll give the last word in this section of "Remembrances of Herbert Freeman" to Herb himself.

With fond memories,
Linda O'Gorman

From Herb to me:

Dear Linda,
Many thanks for forwarding this material to me. I am just overwhelmed!!

Best regards,

Herb

Meeting Reports

Conferences, Workshops & Summer/Winter Schools



Conference Chair:

Kurosh Madani, University of Paris-EST Créteil (UPEC), France

Program Chair:

Ana Fred, Instituto de Telecomunicações and University of Lisbon, Portugal

by Kurosh Madani and Ana Fred

DeLTA2020 was held as an online event. The conference was sponsored by the “Institute for Systems and Technologies of Information, Control and Communication (INSTICC)”, and endorsed by IAPR. For this first edition, DeLTA2020 was organized “in cooperation” with a number of international organizations involved in research related to Deep Learning, Big Data Analytics, Machine Learning, Computer Vision Applications, Natural Language Understanding, and Artificial Intelligence: the ACM Special Interest Group on Artificial Intelligence (ACM SIGAI), the International Neural Network Society (INNS), and the European Society for Fuzzy Logic and Technology (EUSFLAT).

The main goal of DeLTA is to provide a meeting point for researchers and practitioners involved in investigating the

manifold facets of deep learning, big data analytics, machine-learning, 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 to investigate brand new approaches.

DeLTA received 28 submissions from 16 countries. Out of the accepted papers, 4 were selected for oral presentation as full papers, 8 for oral presentation as short papers, and 2 for poster presentation.

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

- **Petia Radeva**, Universitat de Barcelona, Spain (Distinguished IAPR Speaker): *"Uncertainty Modeling within an End-to-end Framework for Food Image Analysis"*
- **Vincent Lepetit**, École des Ponts ParisTech, France: 3D *"Scene Understanding from a Single Image"*

The conference organization assigned two awards to be given during the conference to testify the value of the best contributions: the Best Paper Award, and the Best Student Paper 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 during the sessions. For this edition, the winning papers were:

• **Best Paper Award**

Data Augmentation for Semantic Segmentation in the Context of Carbon Fiber Defect Detection using Adversarial Learning
by Silvan Mertes, Andreas Margraf, Christoph Kommer, Steffen Geinitz and Elisabeth André

• **Best Student Paper Award**

Attention-based Text Recognition in the Wild by Zhi-Chen Yan and Stephanie A. Yu

Furthermore, the Authors of DeLTA2020 selected papers will be invited to submit a revised and extended version of their work for a book in the Springer CCIS Series.

We look forward to meet you at the 2nd edition of DeLTA.

<http://www.delta.scitevents.org/>.

DeLTA2021 will be in Lieusaint-Paris, France, July 7-9, 2021: put it in your agenda!



Conference Chair



Kurosh Madani
University of Paris-EST Créteil (UPEC)
France

Program Co-chairs



Carlo Sansone
University of Naples Federico II
Italy



Ana Fred
Instituto de Telecomunicações and University of Lisbon
Portugal

PAPER SUBMISSION DEADLINE: February 16, 2021

ANNPR 2020

September 2nd-4th, 2020
ZHAW, Winterthur, Switzerland



General Chairs:

[Dr. Frank-Peter Schilling](#)

[Prof. Dr. Thilo Stadelmann](#)

(Zurich University of Applied Sciences ZHAW, Winterthur, Switzerland)

by Frank-Peter Schilling

ANNPR, the International Workshop on Artificial Neural Networks in Pattern Recognition, is a biennial academic conference organized by the IAPR Technical Committee 3 ([IAPR-TC3](#)) on Neural Networks & Computational Intelligence. It discusses the most recent advances in the fields of neural networks, deep learning and artificial intelligence as applied to pattern recognition.

ANNPR 2020 was hosted by the Zurich University of Applied Sciences ZHAW, and Dr. Frank-Peter Schilling and Prof. Dr. Thilo Stadelmann of ZHAW's Institute of Applied Information Technology (InIT) acted as general chairs of the event.

The planning of ANNPR 2020

was significantly impacted by the consequences of the COVID-19 pandemic, which forced the organizers in the end to move the workshop to an online format, the first time in its history. This was facilitated successfully by means of the well-known Zoom and Slack video-conferencing and networking solutions.

The two-and-a-half-day conference hosted several sessions with 22 oral as well as poster presentations of accepted papers on foundations as well as applications of neural networks in pattern recognition. These were selected out of 34 submissions by a peer review performed by an international program committee. The participating authors and presenters originated from diverse backgrounds and countries

including Belgium, Italy, France, Germany, the United States, Russia, India, Japan, and Egypt as well as Switzerland.

A broad range of topics was discussed at the workshop. In the area of foundations of machine learning and neural networks for pattern recognition, papers discussing novel developments using predictive autoencoders, support vector machines as well as recurrent and convolutional neural networks were presented. On the other hand, applications and solutions to real-world problems were discussed for topics ranging from medical applications (pain recognition, dermatologic imaging, cancer histology, mammography), finance, industrial applications (QR-code detection, wear detection of industrial tools,

geotechnical engineering, 3D point clouds processing), text-to-speech synthesis and face recognition to weather forecasting and crop species classification.

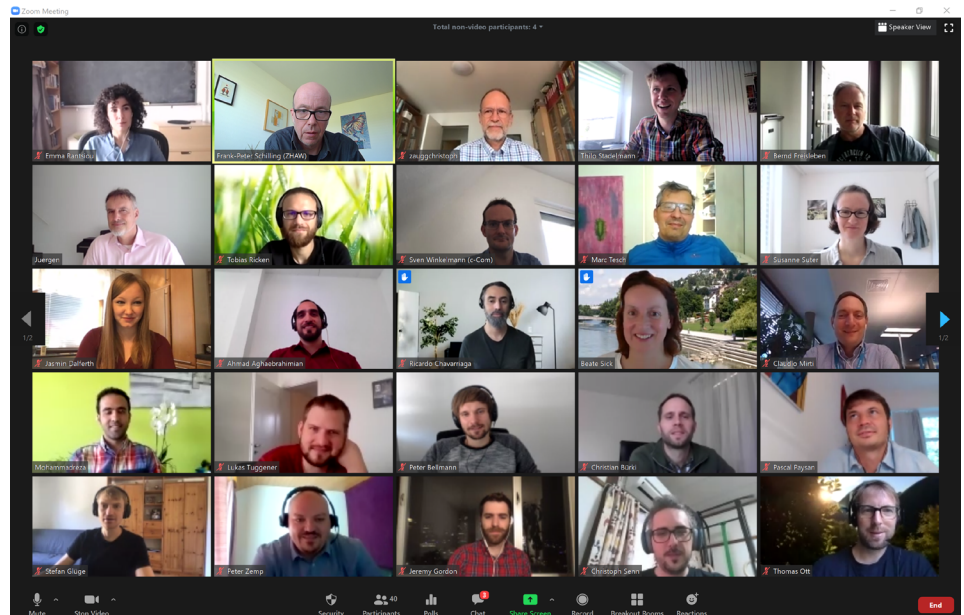
Keynotes

The invited keynote speakers included internationally renowned researchers Prof. Dr. Jürgen Schmidhuber (Swiss AI Lab IDSIA, Lugano, Switzerland), Prof. Dr. Bernd Freisleben (University of Marburg, Germany), and Prof. Dr. Naftali Tishby (Hebrew University of Jerusalem, Israel). Dr. Pascal Paysan from Varian Medical Systems presented an industrial perspective. All four presented achievements in their fields as well as perspectives on current projects. These include new solutions in visual computing (B. Freisleben), developments in unsupervised learning (J. Schmidhuber), global and local information bottleneck frameworks in deep learning (N. Tishby), and machine learning applications in image-guided radiation therapy (P. Paysan).

Industry Participation

The fact that ANNPR 2020 was, for the first time, hosted by a university of applied sciences, offered a unique opportunity to broaden the scope and audience of the workshop. It involved not only academic research, but also applied research as well as real-world use-cases from an industrial setting. The digital economy of Switzerland is mainly located in the Zurich area, represented by big, international tech companies as well as innovative start-ups. Several well-known and emerging tech companies joined the conference and contributed with their experience. This allowed the creation of an engaging hub for the interface between science and industry.

“At ZHAW, we focus on applied



research with industrial partners. We want to open the door between purely academic research and industrial applications”, said Dr. Frank-Peter Schilling, chair of the organizing team.

Despite the online setup, the organizers provided ample room for networking and discussion. For many participants, the industry session on Thursday was one highlight of ANNPR 2020. Seven companies (CSEM, LeanBI, Microsoft, die Mobiliar, SBB, ScorePad, Turicode) presented their applications of machine learning and neural networks in five-minute pitches. Their brief demonstrations were followed by discussions in the companies’ virtual Zoom booths. In those smaller chatrooms, the conference participants could ask questions and connect with the representatives for additional exchange and networking.

Awards

Among the many outstanding papers, one research group stood out and was recognized with the best paper award: “Geometric Attention for Prediction of Differential Properties in 3D Point Clouds” (by A. Matveev, A. Artemov, D. Zorin and E. Burnaev, Skolkovo Institute of Science

and Technology, Russia and New York University, USA). Their work offers a new perspective on the estimation of differential geometric quantities in 3D data representations. In their paper, the authors present a module called “Geometric Attention”, that is “a novel attention-based module for improved neighborhood selection of point clouds”.

Additionally, the IAPR Best Presentation Award recognized the best performances at the online conference. Its two winners are “Going for 2D or 3D? Investigating various Machine Learning Approaches for Peach Variety Identification” (by A. Wróbel, G. Gyax, A. Schmid and T. Ott, ZHAW, Switzerland) and “Structured (De)composable Representations Trained with Neural Networks” (by G. Spinks and M.-F. Moens, Katholieke Universiteit Leuven, Belgium).

The awards were announced during the closing session by the chair of IAPR-TC3, Prof. Dr. Edmondo Trentin (Siena, Italy).

Organization

The workshop would not have been possible without the help of many people and organizations. The organizers are grateful to

the authors who submitted their contributions to the workshop, despite the difficult situation caused by the pandemic. They also thank the members of the program and extended organizing committees for performing the difficult task of selecting the best papers from a large number of high-quality submissions.

The support by the International Association for Pattern Recognition (IAPR), the IAPR Technical Committee on Neural Networks and Computational Intelligence (TC3), the Swiss Alliance for Data-Intensive Services, the School of Engineering of the Zurich University of Applied Sciences ZHAW, as well as our sponsoring

partners is greatly appreciated.

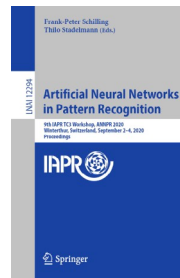
Among the previous editions of the workshop were ANNPR 2018 (Siena, Italy), ANNPR 2016 (Ulm, Germany), ANNPR 2014 (Montreal, Canada), ANNPR 2012 (Trento, Italy), ANNPR 2010

(Cairo, Egypt), ANNPR 2008 (Paris, France), ANNPR 2006 (Ulm, Germany) and ANNPR 2003 (Florence, Italy).

The conference proceedings are published by Springer within their LNCS/LNAI series and are available at <https://link.springer.com/book/10.1007/978-3-030-58309-5>.

Additionally, a special issue of the MDPI journal "Computers" has been set up to host extended versions of the top-5 papers from the workshop; it is also open to general submissions until November 1st, 2020: https://www.mdpi.com/journal/computers/special_issues/ANNPR2020.

Click on the image to the right to go to the publisher's web page for this volume.



From: IAPR-TC3 [News and events](#):

"TC3-endorsed Special Issue on Computational Algebraic Topology and Neural Networks in Computer Vision of the journal Mathematics"



Special Issue "Computational Algebraic Topology and Neural Networks in Computer Vision"

Guest Editors:

[Prof. Rocio Gonzalez Diaz](#), Guest Editor

Departamento de Matemática Aplicada I, Escuela Técnica Superior de Ingeniería Informática, Universidad de Sevilla Campus, Reina Mercedes, 41012 Sevilla, Spain

Interests: computational algebraic topology, topological data analysis; computer vision; discrete geometry; combinatorial image analysis; neural networks

[Prof. Dr. Matthias Zeppelzauer](#), Co-Guest Editor

Institute of Creative Media Technologies, University of Applied Sciences, St. Pölten, Matthias Corvinus-Strasse 15, 3100 St.Pölten, Austria

Interests: computer vision; pattern mining; topological data analysis; representation learning; active learning

Deadline for manuscript submissions: **30 September 2021**

For more information: https://www.mdpi.com/journal/mathematics/special_issues/Computational_algebraic_topology_neural_networks_computer_vision

General Co-Chairs:

Gernot A. Fink, TU Dortmund University, Germany;
Lambert Schomaker, University of Groningen, The Netherlands

Program Committee Chairs:

Elisa Barney Smith, Boise State University, USA;
Cheng-Lin Liu, Chinese Academy of Sciences, Beijing, China;
Marcus Liwicki, Luleå University of Technology, Sweden

by Gernot A. Fink and Elisa Barney Smith

The International Conference on Frontiers of Handwriting Recognition (ICFHR) has a long tradition going back to the first International Workshop on Frontiers of Handwriting Recognition (IWFHR) held in Montreal, Canada, in 1990 with follow-up workshops organized in Chateau de Bonas, France (1991), Buffalo, USA (1993), Taipei, Taiwan (1994), Colchester, UK (1996), Taejeon, South Korea (1998), Amsterdam, The Netherlands (2000), Niagara on the Lake, Canada (2002), Tokyo, Japan (2004), and La Baule, France (2006). In 2008 the series of workshops was transformed into a conference series with the first ICFHR held in Montreal, Canada. Subsequent ICFHRs were organized in Kolkata, India (2010), Bari, Italy (2012), Crete, Greece (2014), Shenzhen, China (2016), and Niagara Falls, USA (2018). In 2020 it was planned that ICFHR should return to Europe. ICFHR 2020 should have been held in the city of Dortmund, Germany, hosted by TU Dortmund University.

However, in 2020 the COVID-19 pandemic drastically changed the world and the way people interact. Unfortunately, this also affected the organization of scientific exchange during conferences. Therefore, following the example of many other scientific events, ICFHR 2020 was realized as a fully virtual conference. Thus, the safety of all attendees and the possibility of broad international participation could be ensured during this important conference of the Document Analysis community.

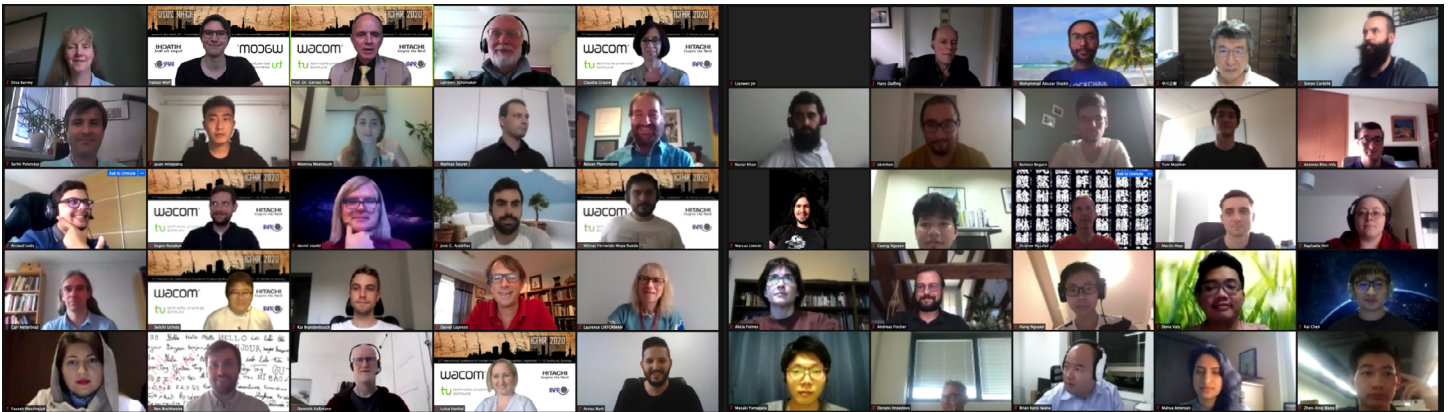
ICFHR 2020 was sponsored by Wacom (Gold Sponsor) and Hitachi (Silver Sponsor) and supported by Gesellschaft der Freunde der TU Dortmund, TU Dortmund University, and the IAPR Technical Committee 11 ([TC-11](#)) on "Reading Systems".

Scientific Program

The call for papers for ICFHR 2020 resulted in 108 submissions from institutions from 33 countries. Each paper underwent a double-blind review process with reviews provided by the Program Committee Members and a number of additional supporting reviewers. Decisions were made

based on the reviews and in many cases follow-up discussions among the reviewers and PC chairs. In total 60 papers were accepted for publication (56% acceptance rate). From these 35 were selected for oral and 25 for poster presentation.

The resulting high-quality conference program covered a broad spectrum of topics in the context of handwriting recognition. The majority of the papers were on how to use machine learning to accomplish handwriting recognition. Here deep learning is still a major topic in our field, and papers frequently addressed how to recognize when constrained by low-resource data (using data augmentation, synthesis, or weakly supervised learning). Furthermore, attention-based methods and more sophisticated methods combining end-to-end architectures for specific tasks were present in many publications. While the majority of the contributions targeted historical handwritten data, other topics of interest were handwriting analysis and generation, mathematical expression recognition, the



recognition of musical scores, writer identification and recognition of handwriting in Asian scripts.

The technical program was complemented by three keynote presentations of internationally renowned researchers.

- Thomas Desealers (Apple, Zurich, Switzerland) reflected on "Online Handwriting Recognition and Beyond".
- Alicia Fornés (Universitat Autònoma de Barcelona, Spain) shared her experience in "Recognition of handwritten textual and graphical documents in the deep learning era".
- Daniel Stökl Ben Ezra (Université Paris Sciences-Lettres, France) complemented these topics from a digital humanities perspective by presenting his views on "Computational Document Analysis: New and Open Questions from a Pragmatic Perspective".


Research questions in digital humanities and how they relate to handwriting recognition research were also the topic of a tutorial entitled "Why would you study handwriting?" presented by Dominique Stutzmann (Institut de Recherche et d'Histoire des Textes (CNRS), France) and Irene Ceccherini (University of Florence, Italy).

In a special session, the results of three competitions, organized in

conjunction with the conference, were presented, addressing current research challenges in handwriting recognition and related areas. Future challenges in the field were the topic of a panel session where experts from industry and academia shared their views on the development of the field and gave new ideas and valuable inspiration to the audience for future research.

The conference proceedings have been published in collaboration with the IEEE Computer Science Conference Publishing Services (CPS) and will be made available via IEEE Xplore.

Proceedings of
ICFHR 2020 are available through



<https://ieeexplore.ieee.org/xpl/conhome/9257614/proceeding>

Virtual Conference

The technical realization of the virtual ICFHR 2020 made use of Zoom in order to implement video-conferencing interaction. Additionally, a system supporting parallel discussion forums for posters was set up using Moodle. Live sessions were held during a time-frame from 2 PM to 6 PM (CEST; Tokyo: 9 PM to 1 AM; San Francisco: 5 AM to 9 AM) in order to give participants around the

world living in different time zones an adequate possibility to attend. With respect to a full-day physical conference this resulted in a reduced duration of the conference days. Consequently, this limited time was devoted to keynote presentations and the discussion of oral presentations. The presentations of keynotes were given as live streams, whereas the presentation of papers was achieved using pre-recorded videos. Authors of oral papers recorded 15 minutes videos, which were discussed live in groups during 45 minute sessions. Poster authors uploaded 5 minute videos and an accompanying poster document, which were discussed asynchronously during the whole conference duration via Moodle. Special sessions included the presentation of competition results, the TC-11 session, a virtual sponsor's booth for our Gold Sponsor Wacom, and the panel discussion each given as live streams.

The Virtual ICFHR 2020 welcomed a total of 135 registered participants from 26 countries (including 105 paid registrations, VIPs, guests, and organizers). We observed a very healthy participation in the online sessions with up to 100 participants attending keynote sessions and roughly 70 participants on average during the discussion of oral papers and the panel discussion. Unfortunately, the online forums

intended for virtual discussion of poster papers were not heavily used by the participants. This confirms that a good presentation format for poster papers during virtual conferences still has to be found.

ICFHR 2020 Awards

In order to appreciate the work and effort invested in the appearance of participants on the virtual conference platform and the video presentations of papers, two special awards (coming with a certificate and an ICFHR 2020 backpack) were presented at ICFHR 2020.

- Ben Braithwaite, École Polytechnique Montréal, received the ICFHR 2020 Best Zoom

Background Award for his background image showing a document with text snippets in a variety of scripts (bottom row, 2nd from left in Group Photo).

- Antonio Ros-Vila, University of Alicante, received the ICFHR 2020 Best Video Presentation Award for his video presenting the paper entitled "Exploring the two-dimensional nature of music notation for score recognition with end-to-end approaches".

For scientific achievements, a Best Paper and a Best Student Paper Award were presented at ICFHR 2020 (coming with a certificate and a monetary prize).

- The ICFHR 2020 Best Student Paper Award was presented

to Mingyang Guan, Haisong Ding, Kai Chen and Qiang Huo for their outstanding paper entitled "Improving Handwritten OCR with Augmented Text Line Images Synthesized from Online Handwriting Samples by Style-Conditioned GAN".

- In recognition of their outstanding contribution the ICFHR 2020 Best Paper Award was presented to Lei Kang, Pau Riba, Marçal Rusiñol, Alicia Fornés and Mauricio Villegas for the paper entitled "Distilling Content from Style for Handwritten Word Recognition".

The next ICFHR will be held in 2022 in Hyderabad, India.

ICFHR 2022

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ICFHR 2022

INTERNATIONAL CONFERENCE ON FRONTIERS IN HANDWRITING RECOGNITION

📅 December, 2022

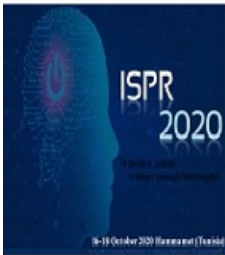
📍 Hyderabad, India

WELCOME TO ICFHR2022

The 18th International Conference on Frontiers of Handwriting Recognition (ICFHR), formerly called International Workshop on Frontiers of Handwriting Recognition (IWFHR), is the most important scientific venue in the field of handwriting recognition. The aim of this conference is to bring together international experts from academia and industry to share their experiences and to promote research and development in all aspects of handwriting recognition and applications.

HISTORY OF ICFHR

ICFHR is a major event supported by the IAPR Technical Committee TC-11 (Reading Systems). Previous venues of this series were IWFHR'90 (Montreal), IWFHR'91 (Chateau de Bonas), IWFHR'93 (Buffalo), IWFHR'94 (Taipei), IWFHR'96 (Colchester), IWFHR'98 (Taejon), IWFHR 2000 (Amsterdam), IWFHR 2002 (Niagara on the Lake), IWFHR 2004 (Tokyo), IWFHR 2006 (La Baule), ICFHR 2008 (Montreal), ICFHR 2010 (Kolkata), ICFHR 2012 (Bari), ICFHR 2014 (Crete), ICFHR 2016 (Shenzhen), ICFHR 2018 (Niagara Falls, USA) and ICFHR 2020 (Dortmund, Germany). The 18th ICFHR will be held in the "City of Pearls", Hyderabad, India in 2022.



The International Conference on Intelligent Systems and Pattern Recognition

16-18 October Hammamet (Tunisia)

<https://ispr2020.sciencesconf.org>

General Chair

Akram Bennour, Larbi Tebessi University, Algeria

Program Committee Chairs:

Abbas Cheddad, Blekinge Institute of Technology, Sweden.

Mohamed Rida Laouar, Larbi Tebessi University, Algeria

by the General Chair

The first ACM International Conference on Intelligent Systems and Pattern Recognition (ISPR'2020) was organized by LAMIS Laboratory Department of Mathematics and Computer Science at Larbi Tebessi University, Tebessa, Algeria in collaboration with MIRACL laboratory Digital Research Center of Sfax, Tunisia. The event aimed to provide an interdisciplinary forum of discussion to share the recent advancements in different areas of artificial intelligence and pattern recognition. It was endorsed by the International Association of Pattern Recognition (IAPR).

We had a duty of care to ensure that our conference was held as much as possible in a safe environment within the limitations and advice of the Government and the World Health Organization.

Due to the COVID-19 pandemic situation, and considering the world-wide displacement restrictions and the closed borders of most of the countries, it was impossible that the ISPR '2020 conference could be held on site (with physical presence) .So,

After long discussions between the organizers, partners, the ACM society and the IAPR association, it was found that considering the choice of having the conference virtually would be the best solution to make sure that ISPR'2020 will be going ahead as planned.

After a thorough and competitive paper review and selection process, 13 papers were accepted for presentation and publication. The conference comprised oral sessions where authors presented their research contributions in different areas of Intelligent Systems and Pattern Recognition.

Two keynote talks were delivered at the conference:

- The first keynote talk was presented by Dr. Abbas Cheddad, Blekinge Institute of Technology, Sweden. Title: "Image Processing in Cross-disciplinary Research".
- The second keynote talk, was delivered by Dr. Yousri Kessentini, Digital Research Center of Sfax (CRNS), Head of the Deep Vision research team, Sfax, Tunisia. Title: "Document analysis and recognition: The Deep Learning Era"

The biographies of the keynote speakers along with the slides of the talk have been made available on the conference website.

Three awards were announced at the conference as "IAPR Best Paper Awards" and were presented to the following papers:

- "Convolutional Neural Network for Chest X-ray Pneumonia Detection", by Ilies Lahsaini, Mostafa el Habibdaho, and Mohammed Amine CHIKH
- "Efficient Graph-based Kernel using Covariance Descriptors for 3D Facial Expression Classification", by Walid Hariri, and Nadir Farah
- "Convolutional Neural Networks for opinion mining on Drug reviews", by Fatiha Youbi & Nesma Settouti

Moreover:

The Proceedings of ISPR'2020 will be published in ACM Digital Library. The ISBN number assigned to ISPR2020 Proceedings is 978-1-4503-7502-3

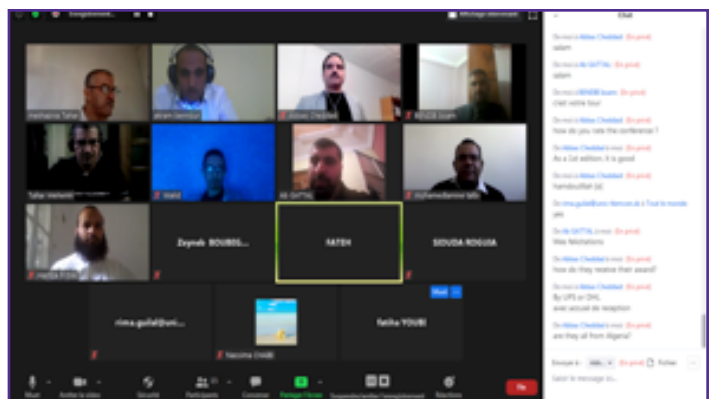
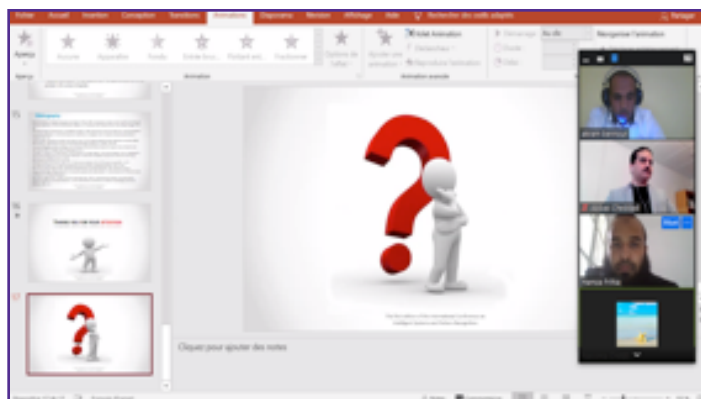
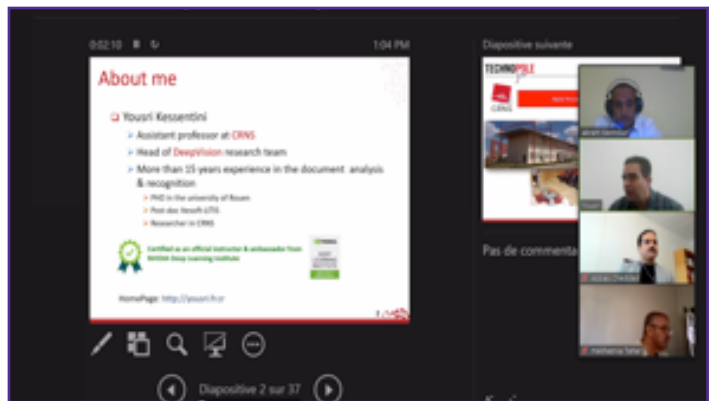
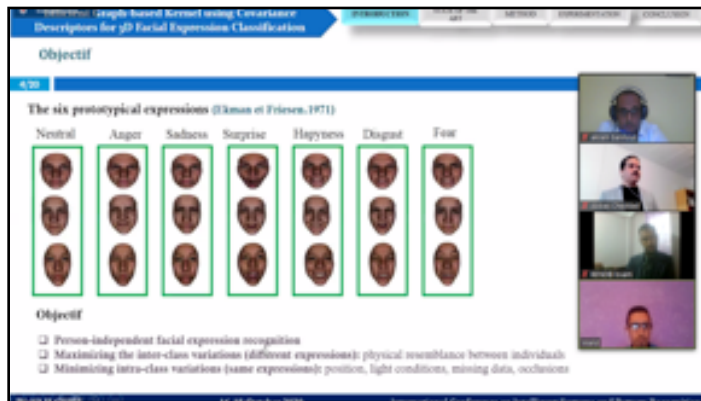
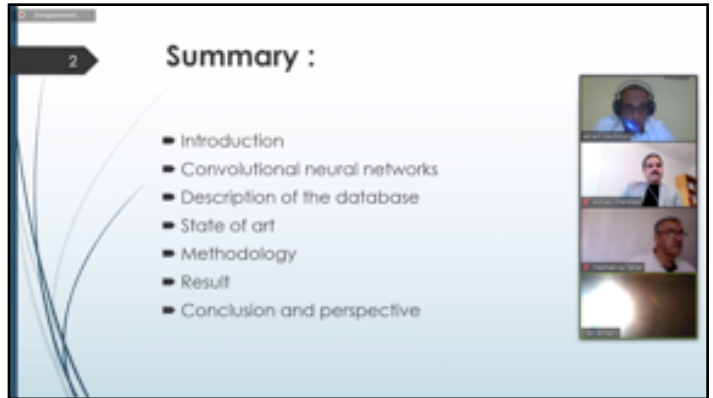
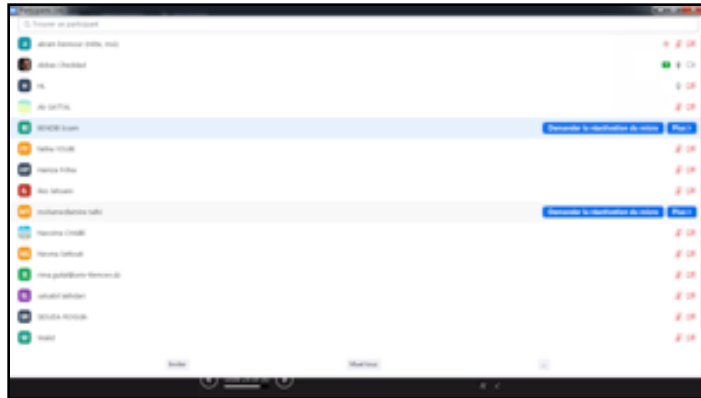
Extended versions of the top best three papers were recommended for a possible publication in the [Pattern Recognition Letters](#).

[Journal](#), Elsevier, in a Special Section on Intelligent Systems and Pattern Recognition. Coordination with the PRL Journal has been established and the special section platform will open in January 2021 for submissions.

Extended versions of the best selected papers were recommended for the possible publication in the [International Journal of Computational Systems Engineering](#), InderScience, in a Special Issue on "Recent

Advances on Intelligent Systems and Pattern Recognition.

ISPR 2020 Sample of Screenshots from the Zoom meeting





This bulletin board
contains items of interest to the
IAPR Community



Pattern Recognition
Letters

Upcoming

Special Issues in

Pattern Recognition Letters

<https://www.journals.elsevier.com/pattern-recognition-letters>

**Unsupervised Pattern Learning, Analytics & Prediction For
The Covid-19 Global Pandemic (VSI:PR-COVID)**

Guest Editors: B.Nagaraj, Rathinam Group of Institutions,
Coimbatore, Tamilnadu, India - Danilo Pelusi, University of
Teramo, Italy - Valentina E. Balas, Aurel Vlaicu University of
Arad, Romania

Submission period: **April 1, 2021 - April 20, 2021**

More information at: [https://www.journals.elsevier.com/
pattern-recognition-letters/call-for-papers/unsupervised-
pattern-learning-analytics-prediction-of-covid](https://www.journals.elsevier.com/pattern-recognition-letters/call-for-papers/unsupervised-pattern-learning-analytics-prediction-of-covid)

**Real-Time Computer Vision For Accident Prevention And
Detection (VSI:RT-APRED)**

Guest Editors: Vijayalakshmi Saravanan, Rochester
Institute of Technology, United States - Isaac Woungang,
Ryerson University, Canada - Alagan Anpalagan, Ryerson
University, Canada

Submission period: **May 1, 2021 - May 20, 2021**

More information at: [https://www.journals.elsevier.com/
pattern-recognition-letters/call-for-papers/real-time-
computer-vision-for-accident-prevention](https://www.journals.elsevier.com/pattern-recognition-letters/call-for-papers/real-time-computer-vision-for-accident-prevention)

**Application of Pattern Recognition in Digital world: Security,
Privacy and Reliability (VSI:APRDW)**

Guest Editors: Rajesh Manoharan (MGE) , Raga academic
solutions, Tamilnadu, India - Sujatha Krishnamoorthy,
Wenzhou-Kean University, China - Changjiang
Zhang , Beijing Normal university. China - Sitharthan
Ramachandran, Vellore Institute of Technology, India

Submission Period: **June 1, 2021 – June 20, 2021**

More information at: [https://www.journals.elsevier.com/
pattern-recognition-letters/call-for-papers/application-of-
pattern-recognition-in-digital-world](https://www.journals.elsevier.com/pattern-recognition-letters/call-for-papers/application-of-pattern-recognition-in-digital-world)



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of readers will carry an impact
statement summarising the context
and significance of the work.

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 *

All dates indicated below are as of the time of publication. Conference dates and venues may change due to COVID-19 concerns. Some may be held online. Please check the conference websites for the most up-to-date information.

	Meeting	Report on previous edition	Venue
2021	FEB ICPRAM 2021 : 10th Intl. Conf. on Pattern Recognition Applications and Methods	ICPRAM 2020	Online
	VISAPP 2021 : 16th Intl. Conf. on Computer Vision Theory and Applications		Online
	MAR ICPRS 2021 : 11th International Conference on Pattern Recognition Systems	ICPRS 2019	Mostly online - Chile
	CIARP PORTO 2021 : 25th Iberoamerican Congress on Pattern Recognition	CIARP 2019	Portugal
	MAY PRIP 2021 : 15th Intl. Conf. on Pattern Recognition and Information Processing	PRIP 2019	Hybrid event - Belarus
	DGMM 2021 : 1st Intl. Conf. on Discrete Geometry and Mathematical Morpholog		Sweden
	JUN MCPR 2021 : 13th Mexican Congress on Patter Recognition	MCPR 2020	Mexico
	JUL MVA 2021 : 17th International Conference on Machine Vision Applications	MVA 2019	Japan
	AUG IJCB 2021 : 2021 International Joint Conference on Biometrics	ICB 2019	China
	OCT IWAIPR 2021 : VII Intl. Workshop on Artificial Intelligence and Pattern Recognition		Cuba



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Ideas for features you'd like to see in the IAPR Newsletter?

Send your comments to: Jing Dong, Editor-in-Chief, jdong@nlpr.ia.ac.cn

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