THE INTERNATIONAL ASSOCIATION FOR PATTERN RECOGNITION

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IAPR Newsletter

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Inside this Issue

From the Editor's Desk

CALLS for PAPERS

Coming in April:
- *Special ICPR 2024 Issue*
- *New Meeting Reports Format*

Calls from IAPR Committees

From the ExCo: News and Essay
- *Introducing the 2024-2026 IAPR Executive Committee*

IAPR Next Generation:
- *Yuxiang Guo*

News from EDI
- *Equality, Diversity, and Inclusion Committee*

PRL Calls
- *Papers*
- *Special Issue Proposals*

Getting to Know IAPR Fellow
- *Elisa Ricci*

Technical Committee News
- *TC2, TC7, TC12, TC15, TC18*

Meeting Reports
- *ICPRS24, ICDAR24, MANPU, ANNPR24, CVMI24, Biometrics Summer School, GRAPHADON*

Bulletin Board

Meeting and Education Planner

April Issue Submission Deadlines

From the Editor's Desk

A Message from the New IAPR President

I would like to start by extending a huge round of thanks to the entire ICPR team, especially Umapada Pal and Cheng-Lin Liu, who worked hard to ensure that ICPR 2024 ran efficiently and offered excellent technical content. While it was unfortunate that many delegates had difficulty with visas, resources were made available for remote presentations, and everything seemed to run smoothly. Visa issues were a consequence of national policies over which the ICPR Team had no control, but the team's efforts and careful attention to technical support made the difficulties manageable.

For those thinking about the next ICPR conferences, ICPR 2026 will be in Lyon, France, and ICPR 2028 will be in Sydney, Australia.

The IAPR works on a 2-year cycle, with new officers elected during the Governing Board meeting at each ICPR. Read more about the new officers in the From the ExCo feature in this issue. Here, we'd like to express a tremendous round of thanks to the outgoing IAPR Executive Committee (ExCo) officers: Arjan Kuijper (President), Lale Akarun (First Vice-President), Cheng-Lin Liu (Second Vice-President), Josep Lladós Canet (Secretary), Bob Fisher (Treasurer), and Dan Lopresti (Past-President).

Finally, the new ExCo is considering several ideas for the period 2024-2026. You will hear more about these in the future:

- *Helping the IAPR national member societies recruit new members.*
- *Building on the ideas from the Online and Hybrid Conference Working Group to increase online and hybrid events, which can open up events to researchers with less financial resources and help reduce carbon miles.*
- *A 100% online, streamlined ICPR-like conference in odd years between traditional ICPRs.*

We look forward to supporting communication and collaboration among researchers in pattern recognition and computer vision and promoting this important research all over the world.

Bob Fisher, IAPR President

Calls For Papers

For the most up-to-date information on IAPR-supported conferences, workshops and summer/winter schools, visit www.iapr.org/conferences

Conferences, Dates, & Locations	2025	Calls and Deadlines (in order from earliest **paper deadline** (other deadlines vary in order))
MCPR 2025 June 25-28, 2025 Guanajuato, Mexico	17th Mexican Conference on Pattern Recognition	Hurry! → **Papers:** Jan. 31, 2025
ICIAP 2025 September 15-19, 2025 Rome, Italy	23rd International Conference on Image Analysis and Processing	**Papers:** 1st round: Feb. 1, 2025 2nd round: Apr. 15, 2025
GbR 2025 June 25-27, 2025 Caen, France	14th IAPR TC15 Workshop on Graph-based Representations in Pattern Recognition	**Papers:** Feb 18, 2025
ICDAR 2025 September 17-25, 2025 Hubei, China	19th International Conference on Document Analysis and Recognition	**Conf. Title & Abst:** Feb 21, 2025 **Full Papers:** Mar 1, 2025
IbPRIA 2025 June 30-July 3, 2025 Coimbra, Portugal	12th Iberian Conference on Pattern Recognition and Image Analysis	**Papers:** Feb 14, 2025 **Tutorial Proposals**: Feb 14, 2025 **Doctoral Cons. Appl.**: Mar 14, 2025
MVA 2025 (site coming soon) July 26-28, 2025 Kyoto, Japan	19th International Conference on Machine Vision Aplication	**Papers:** Mar 31, 2025
2026		
ICPR 2026 August 16-20, 2026 Lyon, France	28th International Conference on Pattern Recognition	**Papers:** TBD

ICPR 2024 WAS A SUCCESS!

Informative presentations, workshops, tutorials, and so much more! Read all about it in the

SPECIAL ICPR ISSUE OF IAPR NEWSLETTER! COMING IN APRIL!

Also coming in April: A New Format for All Meeting Reports!

In order to 1) improve ease of access to relevant meeting information, 2) make reporting easier, more fun, and more meaningful, and 3) extend the reach of new ideas discussed at scientific meetings, *IAPR Newsletter* will no longer ask organizers to write several paragraphs describing their meetings. No more paragraphs about previous venues, attendance, submissions, acceptance rates, keynotes, award winners, etc. Instead, organizers will receive an e-form to fill out and that information will be displayed along with the report. *So... what's in the report?* SCIENCE! We'll ask you to write a minimum of one short paragraph answering questions like these: *Very* breifly describe at least one research question (big or small, practical or philospophical) that was discussed at your meeting. Summarize leading answers and describe the consensus (if there was one). If none, what information/technology is needed to answer the question? Choose any discussion(s) from your meeting (not necessarily the most important), and write as much or as little as you like, as long as these questions are addressed. Your feedback is welcome (email below).

Meeting Organizers: Please check your spam folder and make sure you can receive inbox emails from cab@sayitbetterscience.com

Calls from IAPR Committees

From the IAPR Education Committee:

Call for Applications for IAPR Research Scholarships

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. Applications may be submitted at any time before the visit starts.

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.

Click here to learn more or contact: IAPR Secretariat, c/o Linda O'Gorman, exec-secretariat@iapr.org

From the IAPR Industrial Liaison Committee:

Call for Students Seeking Internship Opportunities and for Companies with Internships Available to contribute to the Internship Listings on the IAPR Internship Brokerage Page

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 do this through a web-based internship listing service. Companies can list their internship opportunities; and students can browse the listings and contact the company.

For Students

If you are seeking an internship, please click on the underlined call title above (or here) to find an updated list of 38 companies –from Adobe to Zhongan Technology– offering internships, locations (some remote), requirements, etc.

NOTE: As of Jan 25, 2024, 45 opportunities are listed, 30 of them with continuous or flexible application cycles.

For Companies with Internships Available

Click on call title (link) above for examples.

Please email your listings as follows:

To: webmaster@iapr.org
Subject: IAPR internships, listing

1. Details:
2. Host:
3. Location:
4. Post Type:
5. Specialty:
6. Funded:
7. Length:
8. Degree & Visa Requirements:
9. Internship start date:
10. Application closing date:
11. Details:
12. Contact::

From the IAPR Executive Committee (ExCo):

Call for Proposals for Summer/Winter Schools

Summer/winter schools are training activities that expose students and junior students to the latest trends and techniques in a 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-supported summer schools should be submitted by email, ***at least four months in advance of the start of the school***.

Send proposals to IAPR Secretariat Linda O'Gorman (exec-secretariat@iapr.org). A PDF attachment containing all the required information is appreciated.

For detailed guidelines, see the Proposal Requirements described in the ExCo Initiative on Summer Schools.

From the ExCo...

Introducing the 2024-2026 IAPR Executive Committee

This is the first News column from the new ExCo. We appreciate the GB's trust and we are excited to start the new term in the service of the IAPR.

The first meeting of the incoming ExCo was in Kolkata on December 5th. The first task is the appointment of the new leaders and members of the Standing and Technical Committees. More information about the composition of the new committees is coming soon.

The 27th International Conference on Pattern Recognition (ICPR 2024) was held in Kolkata, India, December 1-5, 2024. We thank the organization team led by Prof. Umapada Pal for making it a success. A complete report of the conference will be included in the *IAPR Newsletter Special ICPR 2024 Issue,* coming in April 2025. The next stop in the ICPR journey will be Lyon (France) where ICPR 2026 will be held, August 17-21, 2026.

IAPR The biennial Governing Board meeting took place on Tuesday, December 3, 2024, in Kolkata. The main points discussed are summarized below.

Two new Technical Committees were approved. Computer Vision for Industrial Applications (TC8) and Reproducible Research in Pattern Recognition (TC22).

Technical Committee 7 on Remote Sensing and Mapping has been renamed. The new name of TC7 is Earth Observation.

The host of ICPR 2028 was selected. It will be held in Sydney, Australia, August 7-11, 2028.

The IAPR has a new member society: The GB accepted Ecuador a new member. Welcome to the IAPR community!

50th Anniversary(ies) of the IAPR: Celebratory activities took place during ICPR 2024, but the celebration will continue! New activities will be organized for ICPR 2026, culminating in the grand celebration at ICPR 2028, officially marking 50 years since our incorporation and first Governing Board meeting in 1978. If you have ideas about activities to celebrate the anniversary, or memories or photos to share, please let us know by emailing 50th@iapr.org. Be sure to check out our history, where you will soon see an Anniversary video describing the early days of IAPR. Learn more about the 50th Anniversary here.

The biggest news from the IAPR Executive Committee is, of course, a new IAPR Executive Committee. The election of new officers for each 2-year period occurs during the Governing Board meeting at each ICPR.

Nominations are proposed by the IAPR's Nominations Committee (chaired by the Past President). Independent nominations are also accepted. Each nominee prepares a statement for the benefit of the Governing Board, which then elects the officers via secret ballot. (The Governing Board is the set of representatives proposed by the individual national member societies.)

I, Bob Fisher (pictured above), will be serving as IAPR President. I am a Professor in the School of Informatics at the University of Edinburgh, FIAPR, FBMVA, and former IAPR Treasurer, with strengths in 3D computer vision. I am pleased to introduce the new IAPR Executive Committee for 2024-2026:

Jose Francisco Martinez-Trinidad National Institute for Astrophysics, Optics, and Electronics, Mexico. Member of the IAPR C&M Committee and IAPR Ad-hoc Committee on Hybrid Conferences. Strengths in pattern recognition for mixed data.

Ida-Maria Sintorn Uppsala University, Sweden and Vironova AB (CTO). Strengths in image analysis in drug development, cellular and fluorescent nano-particle analysis, and electron microscopy.

Josep Llados Autonomous University of Barcelona, Spain. Director of the Computer Vision Center. Served IAPR as Education Commitee Chair and as ExCo Secretary (2022-2024). Strengths in document analysis.

Arun Ross Michigan State University, USA. He is Associate EiC for the journal *PRL* and Assoc. Ed. of *T-BIOM*. Strengths in biometrics.

Arjan Kuijper Fraunhofer IGD, Germany, The Technical University of Darmstadt, Germany. Assoc. Ed. for *CVUI*, *PR*, and *TVCJ*. IAPR President, 2022-24, Sec, 2018-22. Strengths in mathematics-based methods for machine learning in a wide variety of applications

Yuxiang Guo

Editor's note: Yuxiang Guo is the winner of the IAPR Best Biometrics Student Paper Award at IJCB 2024 for his the paper titled Distillation-guided Representation Learning for Unconstrained Gait Recognition. *In this article, he explains how he became interested in that work and describes it in more detail.*

~ Heydi Méndez-Vázquez , EiC

Yuxiang Guo is a PhD student in the Department of Electrical and Computer Engineering at Johns Hopkins University, where he is advised by Prof. Rama Chellappa. His research primarily focuses on human authentication at long range and various altitudes, utilizing temporal information such as gait for human recognition. Yuxiang received his Bachelor's degree from Glasgow College, in a joint program between the University of Electronics Science and Technology of China and the University of Glasgow. He earned his Master's degree from Northwestern University in Evanston, Illinois.

How did you get involved in pattern recognition?

My journey into pattern recognition began during my undergraduate studies. As a senior in the bachelor's program, I enrolled in a course which included a final project focused on designing a mobile gait analysis system. This project challenged us to develop a straightforward system capable of distinguishing between four specific gait patterns: normal, tiptoe, drunk, and limp. Recognizing the unique dynamics associated with each gait, we utilized three accelerometers, harnessing the variation in acceleration with the help of a machine learning method to extract features, effectively identifying the different types of walking. This experience opened my eyes to the power of machine learning and the importance of efficient representation in pattern recognition. It inspired me to delve deeper into the field, exploring pattern recognition across multiple modalities.

During my Master's program, I applied pattern recognition across multiple projects to enhance my ability to model problems and develop algorithms. I devoted most of my time to a traditional challenge in pattern recognition, Optical Character Recognition (OCR), aimed at recognizing handwritten characters and digitizing them. My goal was to build a lightweight OCR system specifically for mathematical formulas. To achieve high efficiency, we utilized Fourier descriptors as representations for each symbol, coupled with a lightweight neural network instead of a more complex deep neural network. We organized the recognized symbols

in a tree structure, creating a system that offered excellent recognition performance with minimal computational cost. Additionally, I also explored the use of audio modalities to detect the presence of gunshots and employed image recognition to identify different beverages.

After completing my Master's degree, I joined the PhD program at Johns Hopkins University, where I work as a graduate research assistant in the Artificial Intelligence for Engineering and Medicine Lab (AIEM), supervised by Prof. Rama Chellappa. My research focuses on human recognition at long range and various altitudes.

What technical work have you done, and what are your current and future research interests?

As a key team member of the Biometric Recognition and Identification at Altitude and Range (BRIAR) Program, I focus on advancing biometrics research recognizing individuals based on their physical or behavioral attributes. While face recognition is a well-established method in controlled environments, achieving high accuracy in daily scenarios like mobile phone unlocking, it typically requires optimal conditions such as good lighting and close distance. However, authenticating humans in less controlled, outdoor environments presents significant challenges. I would like to extend my deepest gratitude to my advisor, Prof. Rama Chellappa, and my lab mate, Prof. Cheng Peng, whose efforts and insightful contributions have been instrumental in advancing my research in overcoming these challenges.

The BRIAR Program focuses on analyzing data for human authentication using a newly collected dataset designed to mimic real-life conditions across three critical parameters: **1) Domain Variation in Data Collection:** Individuals must be recognized in long-distance captures, while reference data are collected under controlled indoor conditions. This setup mirrors real-life scenarios where there is a stark contrast in quality between known data and the data to be analyzed. **2) Long-Term Recognition Focus:** Traditional authentication systems often rely on short-term recognition, where the subject's appearance remains constant. BRIAR, on the other hand, accounts for variations such as changes in clothing, requiring more sophisticated biometric data extraction for accurate recognition. **3) Challenges of Long Distance:** At longer distances, individuals occupy a smaller portion of the video frame, and images are often distorted by atmospheric turbulence. These factors make reliance solely on appearance-based methods like facial and body recognition inadequate. Consequently, I am exploring the potential of gait recognition as a robust alternative in these challenging conditions.

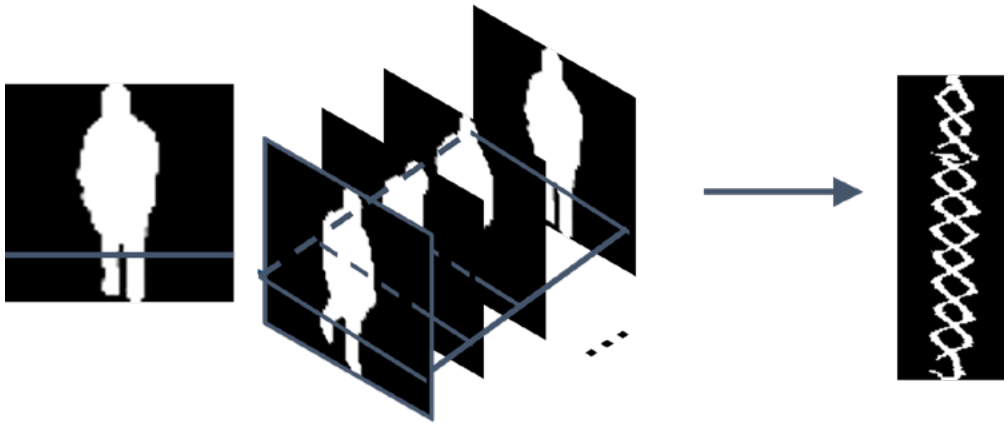


Fig. 1. The generation process of the Double Helical Signature (DHS).

Gait recognition operates on the premise that individual walking patterns vary, allowing us to use this temporal dynamic information to distinguish between people. To capitalize on the temporal data, silhouettes (64×64-pixel images) or key points (17 joint coordinates) represent each frame, rather than conventional RGB images. This approach enhances the robustness of gait recognition against changes in appearance due to clothing or distance, and minimizes the impact of varying domains. However, our research has identified limitations in existing methods that perform well under controlled conditions, but performance suffers in unstructured environments. My research seeks to increase the effectiveness and efficiency of gait recognition by leveraging previously overlooked information and employing model-based representations.

Current gait recognition methods input stacks of silhouettes directly into models, implicitly assuming that subjects are always walking with consistent speed and direction. However, real-life walking sequences often include standing or turning, introducing distinct temporal patterns that complicate feature extraction. To address this, we introduced a gait detection step akin to face detection in face recognition. Our approach uses a novel representation called the Double Helical Signature (DHS, *Figure 1*), which captures knee movement by selecting a single pixel row at knee height from each frame and concatenating. This pattern distinctly identifies moving subjects from stationary ones, and with a five-layer neural

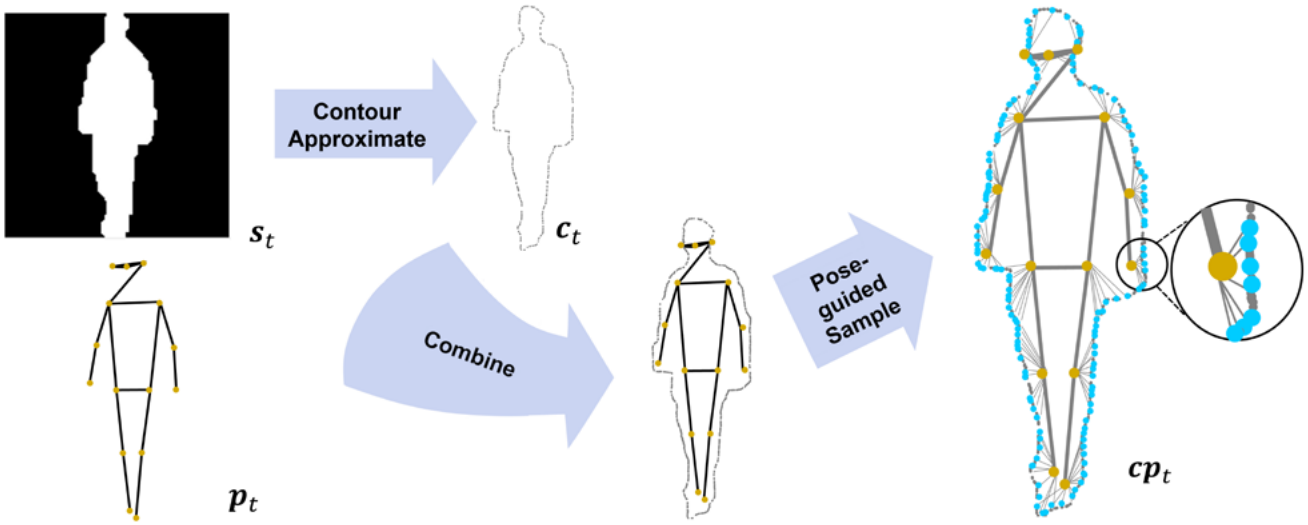


Fig. 2. The construction of Contour-Pose.

network, we efficiently detect the presence of gait, thereby improving the system's overall performance. Furthermore, in our pursuit to refine gait recognition, we recognized the limitations of size normalization in traditional silhouette-based methods, which strip away crucial viewpoint information. To overcome this, we began recording the height ratio for each frame—the ratio between the human's actual height and the normalized silhouette—allowing us to dynamically represent changing viewing angles.

Silhouettes are the primary modality in gait recognition due to their broad applicability and high performance. They are dense and typically processed by 3D convolutional neural network (CNN), demanding substantial computation resources and making them less efficient than face or body recognition methods. In contrast, pose keypoints are typically smaller in input size, enabling lighter models, faster processing and more compact templates. However, reduced accuracy remains a major bottleneck. We developed a hybrid method termed Contour-Pose (*Figure 2*), combining silhouette body shape information with motion data from keypoints. While more points enhance representation quality, directly using attention mechanisms, e.g., transformers, increases computational cost. Therefore, we propose a two-stage feature extraction. In the local stage, we compute local features in five defined regions with shared weights, considering that a significant portion of the computation in a transformer is dedicated to not pertinent relationships, e.g., contour points surrounding the head and legs. Then, we aggregate them to form a global representation in the global stage. This innovative approach not only boosts efficiency but also enhances the performance of gait recognition systems, balancing the demands of computational resources with the need for accurate and effective recognition.

How can the IAPR help young researchers?

As a PhD student, deeply engaged in my research and career objectives, I believe enhancing the visibility and impact of the IAPR community is crucial. One effective way to do this is by increasing the number of invited talks. These talks allow young researchers to access and engage with cutting-edge techniques in each field, sparking collaboration and motivation. They also broaden community's impact and stimulate discussion across the wider scientific community, helping to attract more researchers into our fields and supporting sustainable development within our community.

Furthermore, strengthening connections between industry and academia is essential. Many talented researchers struggle to find suitable positions due to a lack of networking, while companies often cannot find students specializing in specific areas of need. Improving career fairs and enabling our community to serve as a platform that facilitates these connections could foster a valuable cycle. By better linking students with industry and academia, we can ensure that practical needs and problems from companies are addressed, and students find appropriate opportunities, thereby enriching the entire community.

~ Yuxiang Guo

IAPR Equality, Diversity & Inclusion

Note from your EiC, LE, and EDI Committee Chair: This feature of the IAPR Newsletter *is devoted to advertising activities and news from the IAPR standing committee on Equality, Diversity and Inclusion (EDI). The statement of IAPR Policy on EDI can be found here. Our goal in this regular feature is to call attention to EDI initiatives that may be of interest to our readers.* ***Maria De Marsico, Chair of EDI, invites all readers to share information about any related initiatives in their countries or national organizations. Information can be sent to*** demarsico@di.uniroma1.it . ***Please use the subject line: "Relevant Information for IAPR EDI Committee."***

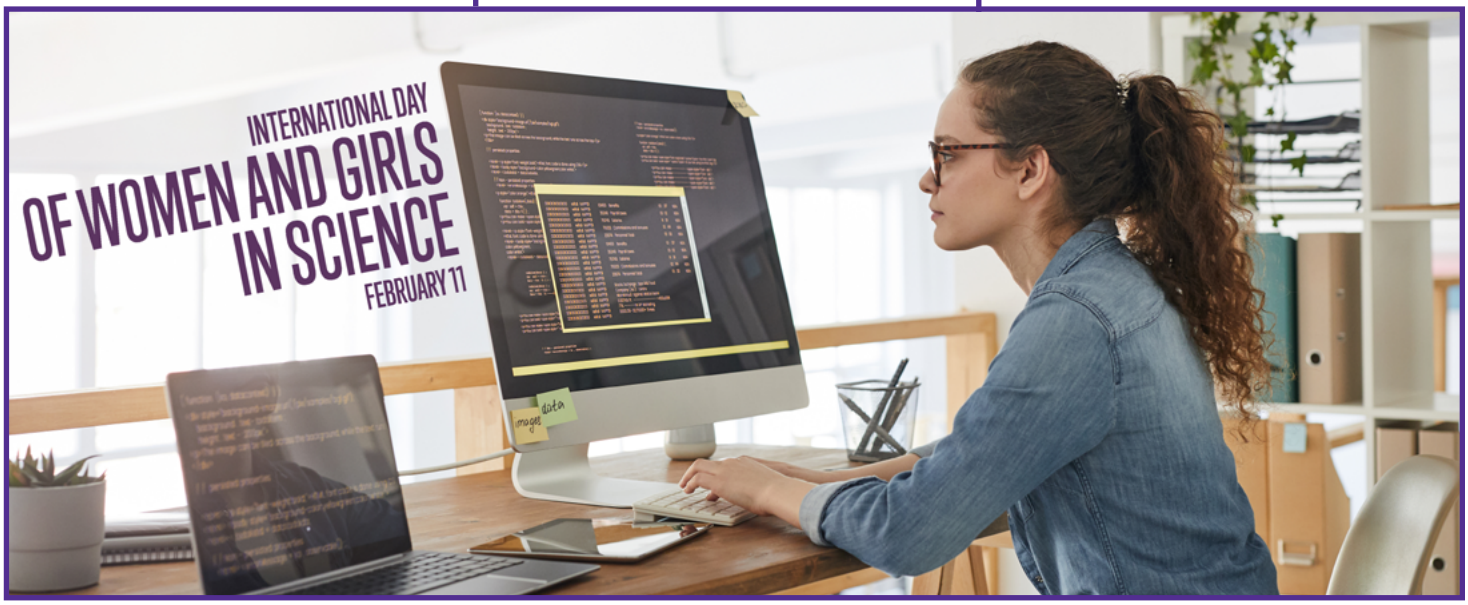
The gender gap in political, economical, and social contexts has long been recognized as a problem to tackle, and readers of our quarterly EDI column are well aware that science is not an exception. In this issue, we wish to attract the readers' attention to an upcoming event by the United Nations Educational, Scientific and Cultural Organization (better known throughout the world as UNESCO).

The event celebrates the 10th anniversary of the International Day of Women and Girls in Science. But first, it is worth providing a short background about the birth of this United Nations (UN) initiative.

Aiming to raise international awareness of the gender gap in science, in 2015, the UN General Assembly issued Resolution A/RES/70/212. The document is short, but full of meaning. The General Assembly reaffirmed the role that women can play in achieving sustainable development, and reiterated its committment to ensuring women's "full and effective participation in sustainable development policies, programmes and decision-making at all levels." Further, the resolution recognized:

> *...that women and girls play a critical role in science and technology communities, and that their participation should be strengthened.*

The document welcomed the efforts of UNESCO, the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), the International Telecommunication Union (ITU), and other organizations in "promoting the access of women and girls to and their participation in science, technology, engineering and mathematics education, training and research activities at all levels." As a consequence and concrete application of the recognition of women's roles, **A/RES/70/212 formalized the decision to proclaim February 11 every year as the International Day of Women and Girls in Science.**



In observance of this day, the resolution invited all UN Member States, organizations both governmental and otherwise, the private sector, educational institutions at all levels, and civil society to engage the public in various types of activities to educate and raise awareness regarding the importance of promoting:

> *"...full and equal participation of women and girls in education, training, employment and decision-making processes in the sciences,* [to] *eliminate all discrimination against women, including in the field of education and employment, and overcome legal, economic, social and cultural barriers thereto by, inter alia, encouraging the development of science education policies and programming, including school curricula, as appropriate, to encourage greater participation of women and girls, promote career development for women in science and recognize the achievements of women in science."*

The 10th anniversary of this important resolution gains further significance considering the UNESCO Call to Action, *Closing the Gender Gap in Science*, launched on the occasion of the 2024 International Day of Women and Girls in Science (a year ago this February). The Call to Action argues that although STEM fields are widely regarded as critical to national economies, most countries, especially in developing areas but unfortunately not only there, have not achieved gender equality in STEM. According to the reported statistics the global average percent of women researchers is only 33.3%. Only 35% of all students in STEM related fields of study are women, and only 30% of all countries with data available on the national share of women researchers had reached parity in 2016. More detailed data can be found by downloading the promotional document from the Call to Action site.

It is worth noting that the reported percent of women in STEM fields overall can be misleading because it varies so widely with both region and scientific discipline. In the mentioned document it is possible to find some data testifying this:

> *"The percentage of women scientists varies by region. According to the latest data from the UNESCO Institute of Statistics, this ranges from 23% of female researchers (in headcounts*) in South Asia to 27% in Southeast Asia, 32% in sub-Saharan Africa, 34% in the European Union, 41% in Arab States, 44% in Latin America and the Caribbean, 47% in Central Asia and 52% in Southeast Europe."*

However, the document also underlines that about one hundred countries did not transmit any data for the period 2018-2021. Scientific disciplines are identified as a further source of considerable variability in the gender gap. For instance, physics is more attractive for men than for women, and in some countries, life sciences and health disciplines either have a more balanced gender distribution or even attract more women [1].

The disciplines recording larger gaps are engineering and computer science: "Globally, women composed only 28% of engineering graduates and 40% of computer science graduates in 2018 (latest available data)" [2]. These data clearly underline that, despite the repeated initiatives around the world, the gender gap in science remains a problem that must be addressed in the common interest. Gender equality remains a global priority for UNESCO, who has said, "the education of young girls and their full ability to make their ideas heard are considered levers for development and peace." [3]

In light of the successes of the past ten years and the challenges that still lie ahead for women and girls in science, UNESCO is planning a 10th anniversary celebratory event at their Headquarters in Paris, France. The title of the event is *2025 International Day of Women and Girls in Science - Unpacking STEM Careers: Her Voice in Science.*

The event, open to the public both in-person and online, will be an occasion to "explore the critical role of women in scientific innovation and discuss the need for inclusive media representation to challenge gender stereotypes" in STEM careers. The celebration is intended as a meeting opportunity for Member States, scientists, public and private leaders, UNESCO scientific networks and Chairs, journalists, and students. The scheduled roundtables are intended to highlight the "transformative power of diversity in STEM," and to "discuss how media can reshape perceptions of gender roles." The event will be closed by a documentary titled *Women of Science: These Women Who Change Our Lives*, which will testify the impact of women in science by presenting the experience of six women scientists, their contributions, and the challenges they have overcome to achieve their successes.

If you are near Paris on Feb 11, 2025, in-person attendance is preferred. Registration is free and is necessary for both online and in person attendees.

Useful information about the event program and registration forms can be found on the 10th Anniversary event page.

It is my wish that you not only enjoyed reading this column, but that you further explore the rich source of information at the UNESCO site and perhaps join in and find a way, large or small, to observe the International Day of Women and Girls in Science, or even attend the celebration. If so, please share your experiences, or send any comment or suggestion to me by email: demarsico@di.uniroma1.it

~ Maria De Marsico|
Chair of IAPR EDI Committee

[1] Pew Research Center. (2021, April). *STEM Jobs See Uneven Progress in Increasing Gender, Racial, and Ethnic Diversity*. Washington, D.C.

[2] UNESCO. (2021). *To Be Smart, the Digital Revolution Will Need to Be Inclusive*: Chapter 3 in UNESCO Science Report. Paris

[3] Audrey Azoulay, "International Day of Women and Girls in Science," *UNESCO*, Accessed January 15, 2025, https://www.unesco.org/en/days/women-girls-science

Upcoming Special Issue
Pattern Recognition Letters

VSI:HCBIA

Open the Brain: Horizons and Challenges in Brain Image Analysis (VSI: HCBIA)

Guest Editors

Sebastiano Battiato
University of Catania, Italy

Francesco Guarnera
University of Catania, Italy

Alessia Rondinella
Univ. Campus Bio-Medico of Rome, Italy

Alessandro Ortis
University of Catania, Italy

Daniele Ravi
University College London, UK

Important Dates

Submission Portal Opens May 1, 2025

Submission Deadline is May 20, 2025

Despite significant progress, brain imaging faces challenges such as data scarcity, lack of standardization in image acquisition, labeling issues, and other technical hurdles. AI is addressing these challenges by enhancing data analysis, improving imaging techniques, and offering robust predictive models, driving major advancements in brain research This special issue aims to explore critical aspects, innovative solutions, and prospects in brain-focused medical imaging. The issue will highlight cutting-edge research, discuss ethical and practical considerations of AI in healthcare, and provide a comprehensive overview of the current state and future directions of AI-driven brain imaging.

Click here to learn more.

Pattern Recognition Letters ~ Call For Special Issues

We invite researchers in Pattern Recognition and related fields to submit proposals for new Special Issues. Special Issues are a unique occasion to collect high-quality papers that pertain to topics not strictly related to the journal, and therefore to expand the scientific offer for our readers.

Selection Criteria

1. The VSI must be **well-focused on a current, relevant topic** of interest for the international scientific community, particularly for researchers in Pattern Recognition. Too-wide topics such as “Deep Networks for Image Understanding” or “Advances in Pattern Recognition for Image Understanding” will not be considered.
1. **The candidate GEs’ scientific production must testify sufficient experience in the proposed topics** in order to better evaluate the overall quality of both papers and reviews.
1. If more GEs participate in the proposal, **a wide geographic distribution will be preferred** to assure a wider submission population; these proposals will be preferred.
1. GEs must **underline in their CVs their engagement with *PRL***, as either authors or reviewers; proposals from such GEs will be preferred.
2. Rotation of GEs is preferred, in groups and/or individually.

Proposals are submitted about one year in advance with respect to the requested submission slot (i.e., the period in which submissions will be uploaded). We divide each year into four quarters, starting in January, April, July, and October. We collect proposals during the first month of the quarter of the year before (e.g., for a Jan-Mar 2026 Special Issue, proposals are collected Jan 2025). Decisions are made in the second month of the quarter of the year before (e.g., Feb 2025), and prospective GEs are notified in the third month of the quarter of the year before (e.g., Mar 2025). In this way, our decision can be made by comparing all proposals for the same quarter.

For candidate GEs’ convenience, a proposal template with all requested information is available.

More details can be found in the documents available here:

After filling the appropriate template, proposals can be submitted via Computer Science Journal Special Issues and Conference Proceedings Proposals

For further inquiries, please contact the EiC for Special Issues, Prof. Maria De Marsico at demarsico@di.uniroma1.it

IAPR FELLOW

Getting to Know...

Elisa Ricci

FOR CONTRIBUTIONS TO MULTIMODAL HUMAN BEHAVIOUR ANALYSIS AND ADAPTATION METHODS FOR VISUAL RECOGNITION MODELS (KOLKATA, 2024)

Elisa Ricci *is a Professor with the Department of Information Engineering and Computer Science (DISI) at the University of Trento and the head of the Deep Visual Learning research group at Fondazione Bruno Kessler (FBK). Her research interests are directed to the development of deep learning algorithms and, in particular, of domain adaptation, continual and self-supervised methods, with applications in the field of computer vision, multimedia analysis and robot perception.*

Elisa received her MSc (2004) and PhD degree (2008) from the University of Perugia. She has been an Associate Professor at University of Trento (2018-2023), Assistant Professor at the University of Perugia (2011-2017) and a researcher at the Idiap Research Institute (2009) and FBK (2010). She has also been a visiting researcher at the Swiss Federal Institute of Technology and the University of Bristol.

*Elisa has co-authored more than 200 scientific publications, and she regularly publishes in top-tier journals and conferences in computer vision and machine learning (*CVPR/ICCV/NeurIPS/ICLR, IEEE TPAMI, IJCV*). She has received numerous awards for her scientific activity (Honorable Mention Award ICCV 2021, Best paper award ACM MM 2015, INTEL Best Paper ICPR 2016, etc). She is a member of the editorial board of the journals* Pattern Recognition *and* Computer Vision and Image Understanding. *She is/was the General Chair of ICMR 2025, Program Chair of ECCV 2024 and ACM MM 2020, the Diversity Chair of ACM MM 2022, Track Chair of ICPR 2020, etc. Since 2023 she has been a member of the ICRA Conference Editorial Board as Editor of the Visual Perception and Learning Area. She is a Fellow of ELLIS and IAPR.*

What motivated you to pursue a career in computer science, and what shaped your research interests in pattern recognition and machine learning?

My journey into computer science happened somewhat by chance. I studied Electronic Engineering at university, which didn't provide me with much exposure to computer science topics. However, during my master's thesis internship at ETH in Zurich, I was assigned a project on applying neural networks for the quantification of dopant profiles extracted by scanning probe microscopy techniques. This was my first encounter with AI and machine learning, and it sparked my interest in the field.

At ETH, I also experienced the beauty of a research environment, which inspired me to pursue a PhD. Little did I know at the time that neural networks would evolve into such a pivotal topic in the years to come. This experience shaped my research path, leading me into academia, where I now direct a research laboratory focusing on deep learning and computer vision.

Tell us about a unique challenge you faced as you began your career in pattern recognition research.

One of the unique challenges I faced when starting my career in research was transitioning from an engineering background to a domain that heavily relies on computational methods and theoretical foundations. My first exposure to this field came during my master's thesis, where I had to study for the first time neural networks. At the time, neural networks were not as popular or well-documented as they are now, and finding resources or mentorship in this area was challenging. I had to learn many concepts on my own while adapting to a fast-paced research environment. This experience, while difficult, taught me resilience and the importance of self-directed learning, which continues to shape my approach to research today.

What do you find most exciting or interesting about your current projects at the Department of Information Engineering and Computer Science, at the University of Trento?

A topic that I have always found fascinating in computer vision is improving the ability of visual recognition systems to generalize effectively and to adapt to scenarios where data arrives in streams. To address these challenges, over the years I have worked with my students and collaborators to develop methods for domain adaptation and continual learning. For example, we have designed algorithms that allow models to adapt dynamically to new domains without forgetting previously learned tasks, enabling more robust and versatile systems.

In this area, recent advances in large multimodal models have driven tremendous progress, resulting in methods with surprising generalization capabilities across a wide range of tasks and data distributions. However, there is still much to be done. One particularly exciting research direction is exploring how to personalize foundation models to improve their adaptability and make them more effective for specific-use cases or individual users. Personalization represents a promising step toward creating more flexible and user-centric AI systems.

Tell us how you balance professional and personal responsibilities on a daily basis.

Balancing professional and personal responsibilities can be especially challenging in a highly competitive field like AI. The rapid pace of advancements and the pressure to stay at the forefront of research demand constant effort and focus. Having a supportive and collaborative group is essential. Diversity within the team is also crucial as it fosters creativity and helps distribute responsibilities more effectively.

Balancing becomes even harder when starting a family with young children. In such situations, organization and prioritization are critical. I've learned to focus deeply during my working hours, ensuring productivity while leaving time for family. It's about making every moment count, both professionally and personally, and finding a rhythm that works for both aspects of life. It took me several months of trial and error to find a rhythm that truly worked for me, and even now, I continue to experiment and refine it. Each day, I focus on organizing my calendar to prioritize the most important tasks. Over time, I have also learned to say no to unnecessary commitments. This was especially challenging to master in the beginning but now it has made a significant difference in maintaining focus and balance.

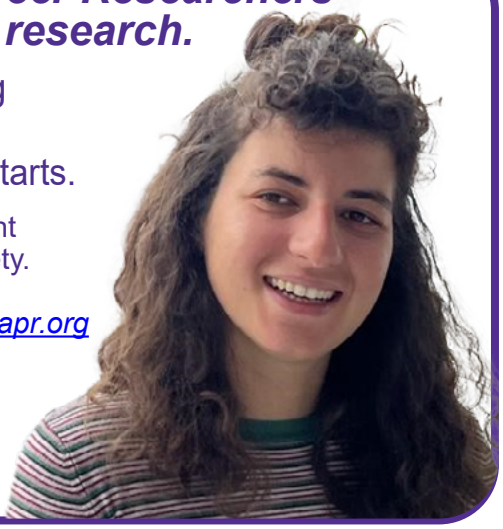
~Elisa Ricci

IAPR Research Scholarships help Early Career Researchers engage in international and inter-institutional research.

Scholarships cover round trip travel and basic living expenses for research visits under 12 months.
Applications may be submitted at any time before the visit starts.

Candidate must be a full-time researcher with between one and eight years experience and must be a member of an IAPR Member Society.
Click here to learn more or contact the IAPR Executive Secretariat Linda O'Gorman at *exec-secretariat@iapr.org*

IAPR Research Scholarships



Technical Committee News

In this issue

(use buttons for page navigation)

- TC2 Structural and Syntactical Pattern Recognition
- TC7 Earth Observation (formerly Remote Sensing and Mapping)
- TC12 Multimedia and Visual Information Systems
- TC15 Graph Based Representations
- TC18 Discrete Geometry and Mathematical Morphology

TC 2

IAPR TC2 Structural & Syntactical Pattern Recognition

iapr.org/tc2

Chair: Luca Rossi (Hong Kong Polytechnic University, Hong Kong)
Vice Chairs: Luca Cosmo (Ca' Foscari University of Venice, Italy)
Bai Xiao (Beihang University, Beijing, China)

AIMS: To promote interaction and collaboration among researchers working on Structural and Syntactical Pattern Recognition (SSPR). Since 1996, the IAPR TC1 and TC2 jointly organize the biennial conference S+SSPR. The event is traditionally colocated with the International Conference on Pattern Recognition (ICPR), attracting participants working in a wide variety of fields that make use of statistical, structural or syntactic pattern recognition techniques.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Building on the success of the 1st TC2 Summer School on Deep Learning on Graphs (2023), the TC2 is organising a new edition of the school, to be held in Bertinoro (Italy) from the 7th to the 9th of July, 2025. International speakers will deliver two days of lectures, incorporating both theoretical and hands-on practical sessions. The event will also include a sharing session for PhD students to showcase their current research and interact with both their peers and the lecturers. Stay tuned here.

Image (left): Civic tower in the medieval village of Bertinoro, Italy

TC 7

IAPR TC7 Earth Observation (formerly Remote Sensing and Mapping)

iapr.org/tc7

Chair: Sylvain Lobry (Paris Descartes University, France)
Vice Chairs: Ksenia Bittner (German Aerospace Center, Munich, Germany)
Charlotte Pelletier (Université Bretagne Sud, France)
Marc Russwurm (École Polytechnique Fédérale de Lausanne (EPFL), Switzerland)

AIMS: To promote pattern recognition methods for analyzing Earth observation data collected from satellites or airborne sensors. In addition, TC7 offers an opportunity for interested researchers to understand better the many diverse research topics in remote sensing that require contributions from the pattern recognition community.

TC7 is changing its name to Earth Observation to better reflect the broad interests of our community.

The 13th Pattern Recognition in Remote Sensing workshop, organized by TC7 and held on December 1st, during ICPR 2024, was a success, with six presentations and two keynotes! We would like to thank IEEE GRSS, IAPR, and ISPR for their sponsorship, and Ujjwal Verma and Johannes Leonhardt for the local organization. More details will be given in the ICPR Special Issue in April 2025.

Finally, we are re-starting the newsletter of the TC7, to which you can subscribe by clicking here.

IN THIS
(Use buttons for page navigation)

- TC2 Structural and Syntactical Pattern Recognition
- TC7 Earth Observation (formerly Remote Sensing and Mapping)
- TC12 Multimedia and Visual Information Systems
- TC15 Graph Based Representations
- TC18 Discrete Geometry and Mathematical Morphology

TC 12

IAPR TC 12 MULTIMEDIA AND VISUAL INFORMATION SYSTEMS

LinkedIn iapr.org/tc12

Chair: Hugo Jair Escalante (INAOE & CINVESTAV, Mexico)
Vice Chair: Sergio Esclara (University of Barcelona, Spain)
Vice Chair: Henning Müller (HES-SO, Sierre, Switzerland)
Information Officer: Albert Ali Salah (Utrecht University, Utrecht, Netherlands)

IAPR TC12 promotes interaction among researchers working in modeling, design, and development of systems for the analysis, processing, description, and retrieval of multimedia and visual information as well as the applications of these systems in challenging domains.

Call for Papers for FG2025: The IEEE conference series on Automatic Face and Gesture Recognition is the premier international forum for research in image and video-based face, gesture, and body movement recognition. Its broad scope includes advances in fundamental computer vision, pattern recognition, and computer graphics; machine learning techniques relevant to face, gesture, and body motion; interdisciplinary research on behavioral analysis; and new algorithms and applications. FG2025 will be held in Clearwater, Florida, May 27-29, 2025.

Second round submissions due: January 31, 2025, 11:59 pm PST

WACV 2025
TUCSON, ARIZONA • FEB 28 - MAR 4

5th Workshop on Real-World Surveillance: Applications and Challenges

This workshop has solicited papers reporting experimental results on any application of computer vision in real-world surveillance, challenges faced, and mitigation strategies on topics like, but not limited to: object detection; tracking; anomaly detection; scene understanding; super-resolution; and multimodal surveillance. The workshop pays special attention to legal and ethical issues of computer vision applications in real-world scenarios. It welcomes papers describing methodology and experimental results on legal matters (like GDPR, AI Act, and US Executive Order on AI) or ethical concerns (like detecting bias towards gender, race, or other characteristics and mitigating strategies). The workshop also hosts a competition on human pose estimation and pose tracking. For more information, click here. For Registration information, click here.

27th ACM ICMI 2025 Call for Workshops

The 27th ACM International Conference on Multimodal Interaction (ICMI 2025) will be held in Canberra, Australia, Oct. 13-17, 2025. ICMI is the premier international conference for multidisciplinary research on multimodal human-human and human-computer interaction analysis, interface design, and system development. ICMI has developed a tradition of hosting workshops in conjunction with the main conference to foster discourse on new research, technologies, social science models, and applications. Prospective workshop organizers are invited to submit proposals in PDF format (Maximum 3 pages).

Please email proposals to the workshop chairs, Albert Ali Salah and Abhinav Dhall, via icmi2025-workshop-chairs@acm.org.

Call for TC12 Members

As noted above, IAPR's Technical Committee 12 (TC12) on Multimedia and Visual Information Systems promotes interaction among researchers working in modeling, design, and development of systems for the analysis, processing, description, and retrieval of multimedia, particularly visual information, as well as the applications of these systems in challenging domains.

If you are interested in joining TC12, please send an email to its incoming (new) chair:
Albert Ali Salah, at a.a.salah@uu.nl

IN THIS
(Use buttons for page navigation)

- TC2 Structural and Syntactical Pattern Recognition
- TC7 Earth Observation (formerly Remote Sensing and Mapping)
- TC12 Multimedia and Visual Information Systems
- TC15 Graph Based Representations
- TC18 Discrete Geometry and Mathematical Morphology

TC 15

IAPR TC 15 GRAPH BASED REPRESENTATIONS

iapr.org/tc15

Chair: Donatello Conte (Université de Tours, France)
Vice Chair: Vincenzo Carletti (University of Salerno, Italy)

Graph theory is a critically important framework for Pattern Recognition and Image Analysis. In the series of processes from a stimulus to its interpretation, graphs are used for several distinct tasks. Examples include hierarchical graphs for image segmentation and for control of perceptual strategies, graph matching for recognition and image understanding, graph manipulation for clustering, and conceptual graphs for representation of relational and structural knowledge. Graphs are efficient as a processing and representational scheme in pattern recognition and image processing when complex and irregularly sampled data need to be synthesized. The goal of TC15 is to federate and to encourage research works in Pattern Recognition and Image Analysis within the graph theory framework.

14TH IAPR-TC 15 WORKSHOP ON GRAPH-BASED REPRESENTATIONS IN PATTERN RECOGNITION (GBR2025)

GbR 2025 is approaching!

GbR is a biennial workshop organized by the IAPR Technical Committee 15, which encourages research works in Pattern Recognition and Image Analysis within the Graph Theory framework. The proceedings will be published in *LNCS*, and the organizing committee is in discussions with *Pattern Recognition Letters* to create a virtual special issue on the workshop's themes.

The workshop will include two invited talks: **Christine Solnon** (INSA de Lyon, France) will speak on efficient graph matching using constraint methods; and **Fragkiskos Malliaros** (CentraleSupélec, Paris-Saclay University, France) will speak on deep learning on graphs.

Registration fees are estimated at around €100.

The paper submission deadline is February 3.

The scope of the workshop includes, but is not limited to:

- Graph-based methodologies for pattern recognition
- Deep learning on graphs: Graph Neural Networks, Graph pooling, Graph-autoencoders...
- Graph-based learning and clustering
- Graph matching and classification
- Graph distance and similarity measures
- Graph kernels and graph embeddings
- Graph-based image segmentation
- Irregular (graph) pyramids
- Graph representation of images and shapes
- Graphs in bioinformatics
- Data mining on/with graphs
- Graphs in social network analysis
- Other graph-based applications in pattern recognition and image analysis

For more details, visit the website. Save the date and participate!

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GbR2025 will be held in Caen (Normandy, France) at the ENSICAEN in the University Campus, June 25-27, 2025

Image Source: ensicaen.fr/student-life/discover-the-campus/?lang=en

IN THIS
(Use buttons for page navigation)

- TC2 Structural and Syntactical Pattern Recognition
- TC7 Earth Observation (formerly Remote Sensing and Mapping)
- TC12 Multimedia and Visual Information Systems
- TC15 Graph Based Representations
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TC 18

IAPR TC18
DISCRETE GEOMETRY AND MATHEMATICAL MORPHOLOGY

iapr.org/tc18

Chair: Sara Brunetti (University of Siena, Italy)
Vice Chair: Benjamin Perret (Universite Gustave Eiffel, France)

The mission of TC18 is to promote interactions and collaborations among researchers working on Discrete Geometry and Mathematical Morphology. It aims to facilitate discussions and identify emerging trends in research areas involving discrete geometry and combinatorial topology, image segmentation and discrete shape analysis, digitized objects, geometrical transforms, image and shape filtering, metrics and machine learning, visualization, and feature extraction.

DGMM 2025

4TH INTERNATIONAL CONFERENCE ON DISCRETE GEOMETRY AND MATHEMATICAL MORPHOLOGY

It is a pleasure to announce that the 4th International Conference on Discrete Geometry and Mathematical Morphology (DGMM 2025) will be held at the University of Groningen, The Netherlands, on November 3-6, 2025.

DGMM 2025 will be the fourth joint event between the two main conference series of IAPR TC18, the International Conference on Discrete Geometry for Computer Imagery (DGCI) and the International Symposium on Mathematical Morphology (ISMM).

DGMM offers the opportunity for researchers, students, and practitioners to share and discuss novel high quality research results within the fields of discrete geometry and mathematical morphology, and their applications to image processing and image analysis. Both theoretical and application-focused contributions related to these fields are welcome.

Important Dates

Title+abstract submission: March 28, 2025

Paper submission deadline: April 7, 2025

Preliminary author notification: June 13, 2025

Rebuttal deadline: June 30, 2025

Final acceptance: July 11 , 2025

Camera ready deadline: September 8, 2025

Conference dates: November 3-6, 2025


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MEETING REPORTS

CONFERENCES, WORKSHOPS, & SUMMER/WINTER SCHOOLS

General Chairs

Cesar Astudillo *(Universidad de Talca, Chile)*
Prof. Sergio A. Velastin *(Queen Mary University of London, UK/Universidad Carllos III, Madrid, Spain)*

Local Chairs

Anastasia Angelopoulou *(University of Westminster, UK)*
Thierry Chaussalet *(University of Westminster, UK)*

We are pleased to present to you the highlights and key moments of the IEEE 14th International Conference on Pattern Recognition Systems (ICPRS24), which took place at the Cavendish Street Campus, University of Westminster, Central London, a vibrant, multicultural and cosmopolitan city with history stretching back to Roman times. The conference took place from July 15th to 18th and was opened by the Vice-Chancellor and President of the University of Westminster Professor Peter Bonfield, Professor Sergio A. Velastin, and the two Local Chairs, Dr Anastasia Angelopoulou and Professor Thierry Chaussalet.

The conference continued the tradition of success shared by its previous editions. It was a joint effort between the University of Westminster (London, UK) and the Chilean Association for Pattern Recognition (ACHiRP), a member of the IAPR. The conference was endorsed by the IAPR and co-sponsored by four chapters of the IEEE UK & Ireland Section (Signal Processing; Circuits & Systems; Computational Intelligence; and Instrumentation & Measurements chapters), *Sensors* journal and the IET's Vision and Imaging Technical Network. We were thrilled to witness the collaboration and knowledge-sharing between experts from diverse fields like computer science, engineering, mathematics, healthcare, and machine learning.

ICPRS24 was a 100% in-person event. However, in one exceptional circumstance, organizers facilitated the virtual participation of a single individual who could not travel to the conference venue.

Papers and Participants

We received a total of 76 paper submissions, demonstrating the growing interest in ICPRS. After a rigorous double-blind peer-review process, including plagiarism detections and strict IEEE/IAPR guideline standards, 42 papers were accepted for publication, resulting in an acceptance rate of 55%. The papers presented at the conference have now been published by the IEEE and indexed in IEEE Xplore.

ICPRS24 attracted an enthusiastic and diverse group of participants, with a total of 67 registered attendees joining the event. The conference fostered a global exchange of ideas and knowledge, with co-authors representing 24 countries, including Canada, Nigeria, UK, Pakistan, Colombia, Chile, India, Japan, and

many more. The orange cirlces in the map above show the distribution of contributors from around the world.

Workshops and Sessions

The conference began with two exciting workshops held in person at the Cavendish Innovation Space at Westminster University. The first workshop introduced the concept of Generative Artificial Intelligence (genAI) and the different models currently available to generate new imaging data. The second workshop was about Reinforcement Learning (RL) and techniques specifically for image analysis tasks. Both workshops included hands-on activities and case studies and provided valuable insights and practical knowledge to the attendees. In addition, both workshops have been accredited by The Institution of Engineering and Technology (IET). Participants were given Certificates of Attendance counting as Continuing Professional Development (CPD).

Throughout the three-day event, ICPRS24 featured 11 sessions which sparked a wide variety of debate on areas such as machine learning in medical applications, biometrics, image analysis, computer vision and real-time systems, AI techniques, natural language processing, principles of pattern recognition, data mining, big data and pattern recognition in agriculture. Each session involved around four to five talks. The sessions were well-received and contributed to the overall success of the conference.

Keynote Speakers

We were privileged to have renowned experts in the field deliver keynote addresses, sharing their valuable insights and visions:

Professor Jan Peters (*Computer Science, Technical University of Darmstadt, Germany*) spoke about inductive biases for robot reinforcement learning.

Professor Dima Damen (*Computer Science, University of Bristol, UK*) highlighted opportunities in egocentric video understanding.

Professor Paolo Soda (*Computer Science and Computer Engineering, University Campus Bio-Medico di Roma, Italy*) talked about resilient AI in healthcare.

Professor Shaogang Gong (*School of Electronic Engineering and Computer Science, Queen Mary University of London, UK*) discussed the idea of multimodal self-supervised learning.

Best Papers

The conference committee recognized exceptional contributions and selected the best papers of the conference, as well as the best student paper. Congratulations to the winners!

The IAPR Best Paper Award was given to Leo Theodon, Carole Coufort-Saudejaud, and Johan Debayle for *Deep Learning-Based Instance Segmentation to Characterize the Morphology of Compact Aggregates through Image Analysis.*

The IET Best Student Paper Award was given to Hao Ren, Xiaojun Ban, and Shengkun Xie for *Optimizing Multi-Target Tracking Through Airborne Passive Sensor Management.*

Organizing Committee

We extend our gratitude to the organizing team for their dedication and hard work in making ICPRS24 a memorable and fruitful event. The organizing team consisted of esteemed individuals from different institutions, each contributing to the success of the conference. For a complete list, click here.

Sponsors

ICPRS24 received generous support from various sponsors, including UoW, ACHIRP, IAPR, IEEE UK + Ireland Section, IEEE Computational Intelligence Chapter, IEEE Signal Processing Chapter, IEEE Circuits and Systems Chapter, IEEE Instrumentation and Measurement Society, The IET's Vision and Imaging Technical Network, *Sensors* journal. We are grateful for their invaluable support.

Conclusions

ICPRS24 was a remarkable gathering of experts, researchers, and practitioners from around the world, promoting knowledge exchange and collaboration in the field of pattern recognition systems. We are delighted with the success of the conference and look forward to continuing this tradition in the future. As part of the University's tradition, this Conference was recognized on the Westminster Website.

Thank you to all participants, sponsors, and organizers for making ICPRS24 a resounding success. Until next year!

ICPRS25 is planned to be the Adolfo Ibáñez University in the city of Viña del Mar, Chile, December 1-4, 2025.

Report Submitted by

César Astudillo

ICDAR Athens Greece 2024

International Conference on Document Analysis and Recognition

Event Co-Chairs
Oleg Gusikhin *(Ford Motor Company, USA)*
Carlo Sansone *(University of Naples Federico II, Italy)*

Program Co-Chairs
Ana Fred *(University of Lisbon, Portugal)*
Allel Hadjali *(LIAS/ENSMA, Poitiers, France)*

The International Conference on Document Analysis and Recognition (ICDAR) is the premier international event for scientists and practitioners involved in document analysis and recognition, a field of growing importance in the age of digital transition.

The 18th edition of this conference, ICDAR 2024, was held in Athens, Greece, August 30th to September 4th, 2024. The format was built upon best practices of previous ICDAR conferences and featured keynote talks, main track sessions, presentations, panel discussions, poster sessions, side workshops, and social events. The conference was held in-person, and authors were expected to present onsite in Athens.

We received 263 paper submissions and accepted 144 (54.8% acceptance rate). Of those, 52 were selected for oral presentation and 92 for poster presentation. There were 402 attendees at ICDAR 2024.

As the premier event for professionals in document analysis and recognition, the conference featured a comprehensive program that included keynote speeches, technical sessions, workshops, tutorials, competitions, and social events.

ICDAR 2024 hosted distinguished experts who shared insights into the latest advancements in document analysis and recognition. The keynote addresses are shown on the next page.

The conference included multiple oral and poster sessions covering a wide range of topics, such as text and symbol recognition, handwriting recognition, document image processing, and more. These sessions provided a platform for researchers to present their latest findings and engage in discussions with peers.

Prior to the main conference, several workshops and tutorials were conducted, focusing on specialized areas within document analysis (*right*). These sessions offered participants the opportunity to gain deeper insights and hands-on experience in emerging topics.

ICDAR 2024 Workshops

Workshop on Document Analysis Systems (DAS)

Workshop on Comics Analysis, Processing and Understanding (MANPU)

Workshop on Machine Vision and NLP for Document Analysis (VINALDO)

Workshop on Computational Paleography (WCP)

Workshop on Advanced Analysis and Recognition of Parliamentary Corpora (ARPC)

Workshop on Automatically Domain-Adapted and Personalized Document Analysis (ADAPDA)

ICDAR 2024 Tutorials

ICDAR Tutorial on Private, Collaborative Learning in Document Analysis

Retrieval Augmented Generation (RAG): Bridging Document Analysis and Recognition with Large Language Models

Hands-On Deep Learning for Document Analysis

ICDAR 2024 Keynote Speakers

Prof Jürgen Schmidhuber
Director, AI Initiative, KAUST

Thoughts about Machine Learning

Dr Maria Kamilaki
Acting Director General D.G. for e-Administration, Library & Publications Hellenic Parliament

Sharing the Past, Preparing the Future: The Digital Transformation of the Hellenic Parliament Library.

Prof Cheng-Lin Liu
Director, State Kay Laboratory of Multimodal Institute of Automation of Chinese Academy of Sciences (CASIA)

Towards Explainable Document Recognition

Vincent Christlein
Pattern Recognition Lab, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

2024 IAPR/ICDAR Young Investigator Award Keynote
Unraveling Scribal Authorship: New Frontiers in Writer Retrieval

IAPR/ICDAR 2024 Best Paper Award
The Learnable Typewriter: A Generative Approach to Text Analysis
by Ioannis Siglidis, Nicolas Gonthier, Julien Gaubil, Tom Monnier, & Mathieu Aubry

IAPR/ICDAR 2024 Best Poster Award
One-shot Transformer-based Framework for Visually-Rich Document Understanding
by Huynh Vu The, Van Pham Hoai, & Jeff Yang

IAPR/ICDAR 2024 Best Doctoral Consortium Poster Award
Multi-Modal Structural Reasoning for Historical Document Information Extraction
by Adrià Molina

ICDAR 2024 also organized nine competitions aimed at evaluating the performance of algorithms and methods related to various areas of document analysis and recognition (*right*). These competitions fostered innovation and provided benchmarks for the community. Click here for more information on competitions,

ICDAR 2024 Competitions

Recognition and VQA on Handwritten Documents

Reading Documents Through Aria Glasses

Multi Font Group Recognition and OCR

Artistic Text Recognition

Recognition of Chemical Structures (CROCS 2024)

Handwritten Text Recognition in Brazilian Essays (BRESSAY)

Few and Many Shot Layout Segmentation of Ancient Manuscripts

Historical Map Text Detection, Recognition, and Linking

Handwriting Recognition of Historical Ciphers (HR-Ciphers)

Social Events: To facilitate networking and community building, the conference included social events that allowed attendees to connect in a more informal setting, enhancing collaboration and the exchange of ideas.

ICDAR 2024 was not only an intellectual gathering but also an opportunity to build lasting connections through thoughtfully curated social events that showcased the beauty and culture of Athens.

The conference kicked off with a vibrant welcome reception at the Skyfall Bar, offering stunning panoramic views of the illuminated Acropolis. Attendees mingled in a relaxed setting, enjoying drinks and light appetizers while taking in one of Athens's most iconic vistas. This elegant evening provided an ideal start to the week, encouraging informal networking and camaraderie.

The highlight of the social calendar was the main event held along the picturesque Athenian Riviera coast. Participants were treated to an unforgettable evening featuring delicious local cuisine, refreshing drinks, and lively dancing by the waterfront. The event's blend of natural beauty, entertainment, and cultural immersion created a perfect atmosphere for attendees to unwind and strengthen professional relationships.

Image Source: https://icdar2024.net/conference-photos/

These meaningful social activities added a unique dimension to ICDAR 2024, leaving participants with cherished memories and fostering a sense of community within the document analysis and recognition field.

Report Submitted by

Basilis Gatos

MANPU 2024

The 6th International Workshop on coMics ANalysis, Processing and Understanding

August 30, 2024
Grand Hyatt Hotel, Athens, Greece

organized in conjunction with ICDAR2024: The 18th International Conference on Document Analysis and Recognition
Grand Hyatt Hotel, Athens, Greece, August 30 - September 4, 2024

General Co-Chairs

Jean-Christophe Burie (*La Rochelle University, France*)
Motoi Iwata (*Osaka Metropolitan University, Japan*)
Yusuke Matsui (*The University of Tokyo, Japan*)

Program Chairs

Rita Hartel (*Paderborn University, Germany*)
Tien-Tsin Wong (*The Chinese Univ. of Hong Kong, Hong Kong*)
Ryosuke Yamanishi *(Kansai University, Japan)*

MANPU is the main workshop related to comics. It gathers mainly researchers in the field of computer science, but also some researchers in fields related to the human sciences.

Comics is a medium constituted of images combined with text and graphic information in order to narrate a story. Nowadays, comic books are a widespread cultural expression all over the world.

From a research point of view, comics images are attractive targets because the structure of a comics page includes various elements (such as panels, speech balloons, captions, leading characters, and so on), the drawing of which depends on the style of the artist and/or author and presents a large variability. Therefore, comics image analysis is not a trivial problem and is still immature compared with other kinds of image analysis. Moreover, digital comics such as webtoons introduce new challenges in terms of analysis and indexing.

In general, the MANPU workshop topics include, but are not limited to:

Comics Image Processing
Comics Analysis and Understanding
Comics Recognition
Comics Retrieval and Spotting
Comics Enrichment
Born-digital Comics
Reading Behavior Analysis of Comics
Comics Generation
Copy Protection - Fraud Detection
Physical/Digital Comics Interfaces
Cognitive Processing and Comprehension of Comics
Linguistics Analysis of Comics

The 1st MANPU was held in Cancun, Mexico in conjunction with ICPR 2016. The 2nd MANPU was in Kyoto, Japan, with ICDAR 2017. As a characteristic point, the latter part of MANPU 2017 was held in Kyoto International Manga Museum, near the conference venue. In 2019, the 3rd MANPU was in Thessaloniki, Greece, in conjunction with MMM (the 25th International Conference on MultiMedia Modeling). MANPU 2020 was impacted by the COVID 19 crisis and was organized as a virtual event in conjunction with ICPR 2020. The 5th MANPU (2022) was in Montreal, Canada, with ICPR 2022, and this (6th) edition was held in Athens, Greece, with ICDAR 2024.

For this edition of MANPU, the Program Committee comprised 25 people from 8 countries: China (1),

France (4), Germany (4), Hong Kong (4), Japan (7), Spain (1), Taiwan (2), and USA (2). We received 16 submissions from authors belonging to 11 distinct countries. After an accurate and thorough single-blind peer-review process, with 3 reviewers assigned to each paper, we selected 8 papers for presentation at MANPU 2024 involving research by authors from seven countries: France (1), Greece (1), Turkey (3), USA (1), Spain/Italy (1), and Japan (1).

The workshop started with an invited talk. The speaker was Neil Cohn, from Tilburg University, Netherlands. He presented his research works on *The Patterns of Global Comics: The Visual Languages of Comics from Asia, Europe, and North America*.

Photo source: MANPU Report Submitted by Jean-Christophe Burie,
Original source: https://research.tilburguniversity.edu/en/persons/neil-cohn

MANPU 2024 consisted of 3 sessions, primarily dealing with:

Comic Understanding
Text Detection, Recognition and Analysis
Benchmarking and Utilization

We also organized a general discussion on the topic of "Generative AI and Comics?" where we tried to address the following questions:

What are the effects of generative AIs on text and image generation for creators, researchers and publishers?

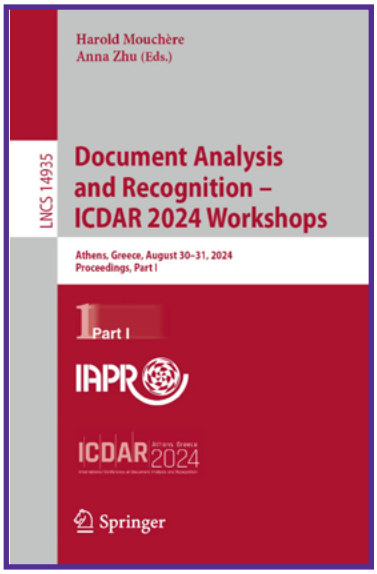
How can generative AIs be used without harming creators?

The workshop was organized as an on-site event and welcomed around 50 people. MANPU 2024 was a successful event where researchers working on Comics Analysis shared their work in this area of research.

Full access to the program and the list of presented papers is available from the MANPU website.

Accepted papers have been published in the ICDAR2024 proceedings.

Report Submitted by
Jean-Christophe Burie,
General Co-Chair



ANNPR 2024

The 11th IAPR TC3 Workshop on Artificial Neural Networks in Pattern Recognition

Chair: Ching Y. Suen *(Concordia University, CENPARMI, Canada)*
Co-Chair: Adam Krzyzak *(Concordia University, CENPARMI, Canada)*
Program and Publication Chair: Mirco Ravanelli *(Concordia University, Canada)*

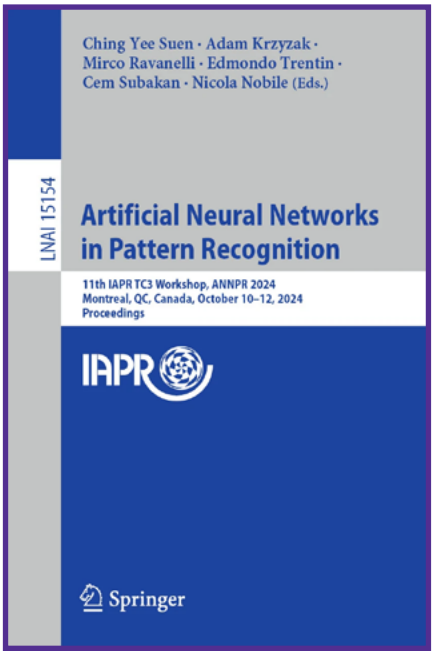
Click here for a complete list of Organizing Committee Members.

The ANNPR series serves as a key international forum for researchers and practitioners focusing on neural network-based and machine learning-based pattern recognition. This biennial event also acts as the meeting of IAPR Technical Committee 3 (TC3) on Neural Networks & Computational Intelligence (TC3 Website).

Following the success of previous editions—including ANNPR 2020 (Dubai), ANNPR 2018 (Siena), and ANNPR 2016 (Ulm)—the 2024 event continued to foster academic collaboration and innovation. Read more details about the conference, including the full program here.

This year, 46 papers were submitted, out of which 27 were selected for oral presentations. The review process was managed through OpenReview, with 42 members of the International Program Committee ensuring rigorous evaluations. The proceedings, published by Springer International, are available here. Thanks to an agreement between IAPR and Springer, participants received free online access to the proceedings for one month following the event.

The workshop invited papers on topics covering both theoretical and applied aspects of machine learning and pattern recognition. Key themes included supervised, semi-supervised, and unsupervised learning; hybrid systems; multiple classifier systems; and various application domains such as computer vision, NLP, speech, and medical applications.



The Program included two keynote talks:

Professor Jay Liebowitz gave a Keynote Address entitled *Responsible AI: AI Ethics and Safety,* and Professor Witold Pedrycz gave a Keynote Address entitled *A Unified Framework of Data and Knowledge Environment of Machine Learning.*

Two additional invited speakers were Professor Adriana Romero, who spoke on *Generative Models as Queryable World Models*, and Prof. Minje Kim, who presented *Neural Speech and Audio Coding*.

An invited tutorial, *EEG Processing with the SpeechBrain-MOABB Toolkit*, was presented by Davide Borra, from the University of Bologna, Italy.

Oral presentations were divided into six sessions based on themes:

Learning Algorithms and Architectures
(6 papers)

Applications in Computer Vision
(5 papers)

Applications in the Medical Domain (Part 1)
(6 papers)

Applications in NLP, Speech, and Music
(3 papers)

Applications in the Medical Domain (Part 2)
(3 papers)

Applications in Environmental and Biological Sciences
(4 papers)

A Panel Discussion featuring industry leaders was attended by over 100 participants and stimulated engaging conversations on real-world AI applications. Panelists included:

Mr. Eduart Haruni (Senior Manager, Artificial Intelligence, Air Canada)

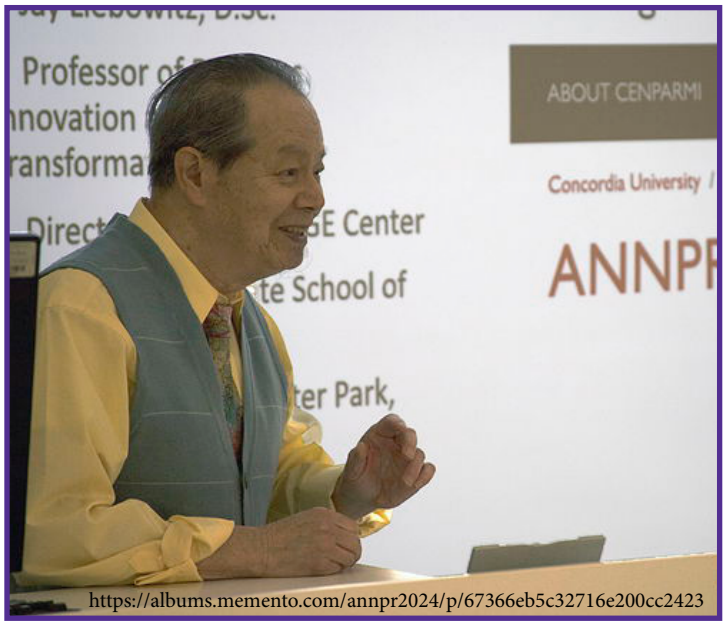
Dr. Muna Khayyat (Machine Learning Lead, Morgan Stanley)

Dr. Chun Lei He (Director, Advanced Analytics, Manulife)

Dr. Saeed Khazaee (CEO, NexaDeeds)

Dr. Mei Chen (CEO, Cogilex R & D Inc.)

Dr. Tony Deng (Senior Data Scientist, Rio Tinto Group)

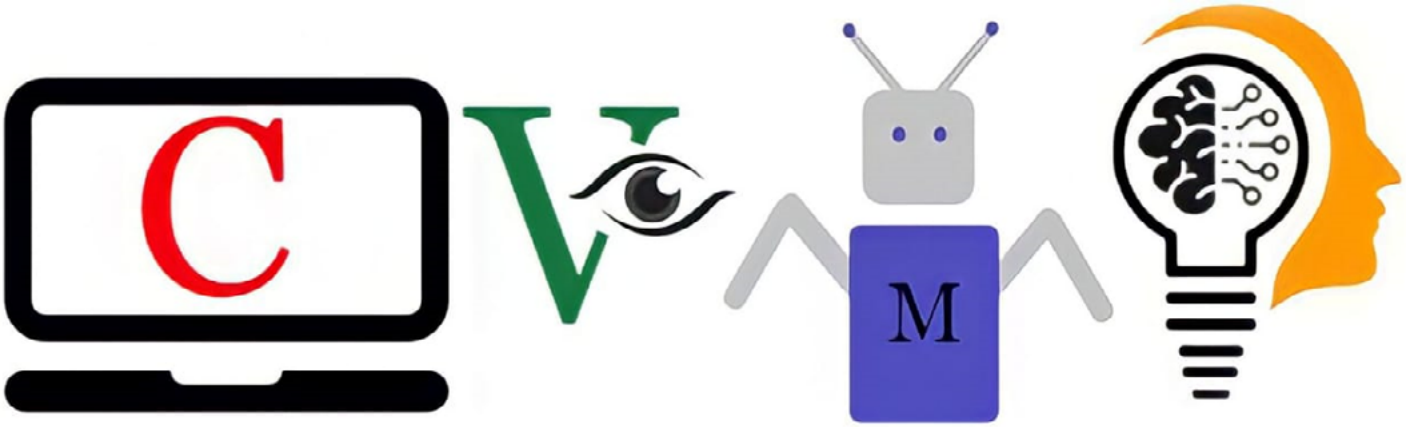


https://albums.memento.com/annpr2024/p/67366eb5c32716e200cc2423

The workshop concluded with a banquet at Ruby Rouge Restaurant in Montreal's Chinatown, where participants enjoyed networking, excellent cuisine, and lively music. The social event provided an informal setting to foster connections among attendees.

ANNPR 2024 successfully continued the tradition of facilitating meaningful discussions on neural networks and machine learning, bringing together academic and industry experts to explore the frontiers of pattern recognition. We look forward to the next workshop, which will be organized in Fall 2026. Stay Tuned!

Report Submitted by:
Mirco Ravanelli,
Program and Publicity Chair



3rd IEEE International Conference on Computer Vision and Machine Intelligence

General Chairs
Massimo Tistarelli *(University of Sassari, Italy)*
Xiaoyi Jiang *(University of Münster,Germany)*

General Co-Chairs
Peter Peer *(University of Ljubljana, Slovenia)*
Abdenour Hadid, *(University Polytechnique Hauts-de-France, France)*

Conference Chairs
KC Santosh *(University of South Dakota, USA)*
KV Arya *(IIITM Gwalior)*
Satish Kumar Singh *(IIIT Allahabad)*
Shiv Ram Dubey *(IIIT Allahabad)*

Conference Co-Chairs
Sanjay Kumar Singh *(IIT-BHU Varanasi)*
Navjot Singh *(IIIT Allahabad)*
Mohammed Javed *(IIIT Allahabad)*

Click here for a complete list of Organizing Committee Members

The present world is witnessing rapid advancements in the field of Information Technology, specifically, in the areas of Computer Vision and Machine Intelligence, cherished by society and industry. Research and Development activities across the globe have been drastically scaled up during the previous decade in these research areas. Hence, a state-of-the-art Computer Vision and Machine Intelligence (CVMI) Conference was conceived by Computer Vision and Biometrics Laboratory (CVBL), Department of Information Technology, Indian Institute of Information Technology Allahabad, India, in 2022, for researchers to disseminate their research outcomes.

Organized at IIIT Allahabad, the IEEE International Conference on Computer Vision and Machine Intelligence (CVMI) is the most prestigious and thematic conference focused on computer vision and machine intelligence. With its high quality, it provides a great platform for students, academia and researchers. The 3rd edition of the conference, IEEE CVMI 2024 was a two-day event held October 19-20, 2024, at IIIT Allahabad (India) and was endorsed by the International Association for Pattern Recognition (IAPR).

The conference was also technically sponsored by IEEE Signal Processing Society Uttar Pradesh Chapter. The IEEE CVMI 2024 was financially co-sponsored by IEEE Uttar Pradesh Section, Science and Engineering Research Board (SERB), Govt. of India and Council of Scientific & Industrial Research (CSIR), Govt. of India. The proceedings of CVMI 2024 will be published by IEEE.

The 3rd IEEE CVMI 2024 was a highly successful conference with 534 technical research paper submissions and active participation from 9 countries: Australia, China, Turkey, USA, South Africa, Norway, Japan, Brazil, and India. The conference consisted of 19 technical sessions, eight Keynote and invited lectures and a doctoral symposium. Out of submitted papers, 158 were accepted after peer review. The number of registered papers was 100, and 96 papers were presented at the conference.

The 3rd IEEE CVMI 2024 was inaugurated in the presence following dignitaries - Prof. Bidyut Barun Chaudhuri (IEEE Fellow and IAPR Fellow and Retired Professor, Indian Statistical Institute Kolkata), Prof. OP Vyas (Director (I/C), IIIT Allahabad and Guest of Honor), Prof. Sri

Niwas Singh (Director, ABV-IIITM Gwalior and Guest of Honor); Prof. Ashutosh Kumar Singh ((Director, IIIT Bhopal and Guest of Honor), and Prof. KC Santosh (University of South Dakota USA, Chair, IEEE CVMI 2024 and Guest of Honor).

In terms of technical contributions, CVMI 2024 included diverse presentations from India, such as Karnataka, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, West Bengal, Madhya Pradesh, Maharashtra, etc. The conference received the papers from IITs, IIITs, NITs, and many Central and State Universities. This year the conference also received technical contributions from industries and R&D organizations. So the conference was truly a good mixture of persons from Academia, Industry, and R&D organizations.

The eight eminent persons talking at the conference as invited/ keynote speakers were Prof. BB Chaudhuri (ISI Kolkata), Prof. Mukul S. Sutaone (IIIT Allahabad), Prof. Sri Niwas Singh (IIITM Gwalior), Prof. Ashutosh Kumar Singh (IIIT Bhopal), Prof. R. K. Agrawal (Jawaharlal Nehru University, New Delhi, India), Prof. KC Santosh (University of South Dakota, USA), Prof. Borut Batagelj (University of Ljubljana, Slovenia), and Prof. Lee Hwee-Kuan (A*STAR, Singapore). All the talks were of high quality and useful for the participants.

The **IAPR Best Paper Award in Computer Vision** was given for the research paper *Identification of Standard Sensible Bands for the Study of Oil Spill from Multi-sensor and Multi-spectral Satellite Imagery,* by Vikash Kumar Mishra from University of Cape Town, South Africa, and

Photo Source: Google Drive link at https://cvmi2024.iiita.ac.in/

the **IAPR Best Paper Award in Machine Intelligence** was given to the paper *Fusion of 3D Convolutional Neural Network and Multifractal Features for High- and Low-grade Glioma Classification using Diffusion Tensor Imaging,* by Sreejith Vidyadharan from Birla Institute of Technology and Science Pilani, Hyderabad.

In addition to IAPR awards, this year the conference organizing committee decided to select two IEEE CVMI 2024 best paper awards on the basis of presentation, question answers, and other subjective parameters. **The IEEE CVMI 2024 Best Paper Award (Computer Vision)** was given to Prayas Sanyal from Heritage Institute of Technology, Kolkata, for the paper *Longitudinal Volumetric Study for the Progression of Alzheimer's Disease from Structural MRI.* **The IEEE CVMI 2024 Best Paper Award (Machine Intelligence)** was given to Chinju John from IIIT Kottayam, for the paper entitled *TransProtFam: A Transformer Derived Deep Learning Model for Hierarchical Protein Family Annotation.* **The IAPR Best PhD Thesis Award** was given to Dr. Subodh Raj M.S., from the National Institute of Technology, Calicut, India for his thesis titled *From Recovery to Recognition: Analysis of Human Poses, Actions, and Activities*. All the awards were presented to the winners during the valedictory ceremony at the end of the conference in the presence of Prof. Mukul S. Sutaone (Director, IIIT Allahabad and Patron of the conference), Prof. Satish Kumar Singh (MNNIT Allahabad), and the Awards and Recognition Committee Chair, IEEE UP Section, Prof. Shekhar Verma (IIIT Allahabad).

In conclusion, the 3rd IEEE CVMI 2024 was a highly successful conference with several state-of-the-art presentations from different countries, and it generated new ideas and avenues for research collaborations within India and abroad. The next edition of the CVMI conference will be at NIT Rourkela.

Report Submitted by

Shiv Ram Dubey

21st International Summer School for Advanced Studies on Biometrics for Secure Authentication

BIOMETRICS: Trustful, Fair and Privacy-Friendly

The 2024 IAPR Summer School on Biometrics was held June 3-7, 2024, in Alghero, Italy. This was the 21st edition of a strongly established training course started in 2003 to promote knowledge dissemination and research in Biometrics and related fields. The school was technically co-sponsored by Eurasip, the European Association for Biometrics, the IAPR and IEEE.

The school's main theme addressed the scientific and technological advances observed in the last 20 years, wishing to tide up the knowledge accrued over the past two decades with the current trends in AI and related fields. The school particularly addressed how the most advanced technologies can be applied to build automatic systems for personal recognition which are fair and trustful while preserving the user's privacy.

Several subjects were taught at the summer school forming a total of 29 hours of theoretical lectures from 21 different lecturers and one informal round table.

The subjects ranged from fundamentals, such as machine learning and pattern recognition techniques applied to biometrics, to more advanced topics such as neuroscience, to applied subjects such as the design of ethical systems, large-scale evaluation, and the deployment of biometrics technologies in forensic cases. This 21st edition of the summer school featured a line-up of exceptional lecturers, selected from the editorial boards of top-level scientific journals and conferences. A keynote by **Prof. Anil Jain**, among the fathers of today's Biometrics, provided an overview of the progress made in the last two decades, the current state of the art in Biometric technologies, and the most promising applications for future developments. **Prof. Tomaso Poggio**, among the fathers of computational neuroscience and machine learning, presented a keynote on the most recent findings in developing a theory and a mathematical framework for deep learning. **Prof. James Haxby**, an outstanding neuroscientist from Dartmouth College, presented a lecture on the representation of visual data in the brain and topographic mapping to design such representations from fMRI recordings. **Prof. Lior Wolf**, from Meta research labs, presented an overview of how to deploy deep learning and convolutional neural networks in biometrics. **Prof. Arun Ross**, from Michigan State University, presented a lecture on the use of generative AI in biometrics. **Prof. Massimo Tistarelli**, from University of Sassari, proposed a number of open and challenging scientific questions to illustrate the past and envision the future of face recognition research. **Prof. Anoop Namboodiri**, from IIT Hyderabad, described the scientific challenges and research outcomes resulting from the most massive deployment

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of biometrics: the AADHAAR system in India. **Prof. Michael King**, from Florida Tech University, described the bias effects in the AI models currently deployed and designed for the development of biometric systems. All lecturers, among the most highly reputed experts in their fields, presented the most up-to-date views in Biometric technologies.

To facilitate the participation of people from far and low income countries, all school sessions were delivered in hybrid mode. Several technological platforms were used to facilitate the engagement of all participants and to maximize the benefits of ongoing discussions, both in-person and online.

The school program was enriched by a round table, held on Wednesday evening, on the impact of bias and fairness in AI models.

Particular effort was extended to choose the best platforms for lecturing and to share data. **Zoom Meetings** was selected as the main platform to broadcast and record the lectures, as it allowed complete control of the audio and video of the lecturers and of the participants. Technical staff carefully monitored all sessions and facilitated the participation of the audience, both on site and online, by enabling the audio-video resources whenever needed, whether that was at the end of each lecture or during the lecture. **Slack** was used to provide a fast communication channel among participants and lecturers. Everybody could exchange documents, send messages and make quick calls for discussion, without the need to explicitly exchange personal data such as phone numbers or email addresses.

Thanks to the Zoom platform, remote participants could not only directly ask questions, but also submit questions and statements online. In this way, even the most shy students could be actively involved and easily interact with the lecturers.

To allow participants to follow lectures despite large time differences in various time zones, all lectures were recorded and made available at the end of each day for two weeks.

School participants were offered the opportunity to display a poster on their research activity (posted for the entire week) and to submit a research paper to be orally presented at the special session organized on Thursday evening.

The School Program (Lectures and Presenters)

Monday June 3

Opening and Presentation of the School Courses
Prof. Massimo Tistarelli - University of Sassari, Italy
Federated Learning for Biometric Applications
Prof. Vishal Patel - Johns Hopkins University, USA
Machine Learning (for Biometrics)
Prof. Alessandro Verri - University of Genova, Italy
Introduction to Biometrics
Prof. Anil Jain - Michigan State University, USA
Deep Learning for Biometrics
Prof. Lior Wolf - Tel Aviv University, Israel
Biometric Recognition at a Distance
Prof. Xiaoming Liu - Michigan State University, USA

Tuesday June 4

Speaker Recognition
Prof. Nicholas Evans - EURECOM, France
Hands on Fingerprint Recognition with OpenCV and Python
Prof. Davide Maltoni - University of Bologna, Italy
30 Years of Face Recognition Research
Prof. Massimo Tistarelli - University of Sassari, Italy
Machine Learning: Recent Progress in Approximation, Optimization and Generalization
Prof. Tomaso Poggio - Massachusetts Institute of Technology, USA

Wednesday June 5

Privacy-preserving Biometrics
Prof. Christoph Busch - Hochschule Darmstadt, Germany
Trustworthy Biometrics and Generative AI
Prof. Arun Ross - Michigan State University, USA

Thursday June 6

Gait and Soft Biometrics and Some Practical Issues
Prof Mark Nixon - University of Southampton, UK
30 Years of Face Recognition Evaluations
Dr. Jonathon Phillips - NIST, USA
Commonality of the Fine-Grained Structure of Neural Representations
Prof. James Haxby - Dartmouth College, USA
Mechanisms for Face Recognition in Humans
Prof. Ida Gobbini - University of Bologna, Italy
Face and Body Representations in Deep CNNs
Prof. Alice O'Toole - University of Texas at Dallas, USA
Exploiting Biometrics: An Industrial Perspective
Dr. Eric Poiret - Idemia, France

Friday June 7

Towards Billion-scale Search for Biometric De-duplication
Anoop Namboodiri - IIT Hyderabad
Forensic Biometrics: The Use of Biometric Data and Databases in Forensic Applications
Prof. Didier Meuwly - Netherlands Forensic Institute, NL
Understanding Bias in Biometrics
Prof. Michael King - Florida Tech University, USA
Biometrics Physical Privacy
Prof. Emilio Mordini - Responsible Technology, France
Concluding Remarks and Discussion
Prof. Massimo Tistarelli - University of Sassari, Italy.

Fifty-one participants, mainly from European countries, but also from India and Africa, attended the school lectures. The school brought together students, researchers, professionals and officers, coming from different universities, research centers, private companies and public offices in the following 11 different countries (in brackets is the number of participants): Belgium (1), Chile (2), China (4), Czech Republic (4), France (4), Germany (6), India (1), Italy (10), Lithuania (3), Mexico (1), Poland (1), Rwanda (9), Singapore (2), UAE (1), and USA (2).

The availability of a remote connection allowed many students from underdeveloped countries, to participate by minimizing or eliminating the travel costs.

This year's students demonstrated a strong interest in the impact of AI models in the development of novel biometric technologies. Most of them are either working directly in the design of biometric systems, either for deployment in society or to pursue high-level scientific research in the field. This not only facilitated the interaction between students and lecturers, but also stimulated and challenged even the most experienced lecturers with questions and requests for explanations in the course of almost all presentations. As a result, both the students and lecturers were much involved in technical discussions and plans for collaborations.

A unique keynote was delivered by Prof. Anil Jain, possibly the most outstanding and highly reputed scientist in the field of biometrics, and Prof. Tomaso Poggio, among the founding researcher on Machine Learning in relation to Neuroscience and Artificial Intelligence. Discussion was proactively fostered by Prof. Anil Jain, and the students were actively engaged in the discussion. Interesting conclusions were drawn on several aspects of biometrics and the application to forensic science, as well as to other scenarios involving the greater public.

Thanks to generous financial support provided from Eurasip, IAPR, IDEMIA and the IEEE Biometrics Council, ten students benefited from a full or partial scholarship to cover registration fees. Sponsorship support was widely advertised during the school week.

For future editions of the school, we plan to continue the open evening discussions. These informal meetings were very much appreciated and provided several promising hints for future research and discussion.

Report Submitted by

Massimo Tistarelli

My Experience at the 21st Biometrics Summer School Alghero, Italy, 2024

by Katarzyna Roszczewska (IAPR Summer School Grant Recipient)

Attending the summer school was a truly remarkable and enriching experience. Before going, I had heard that it offered a unique chance to meet distinguished experts in biometrics and deepen my knowledge in the field. However, the event exceeded even my highest expectations. The program closely aligned with my PhD research, which analyzes bias in presentation attack detection algorithms for face-based biometric systems. This made the lectures and discussions particularly relevant and valuable.

What I found especially rewarding were the discussion groups and the opportunity to engage with speakers and participants during breaks. These interactions added depth to the scheduled sessions and allowed for a richer exchange of ideas. The welcoming atmosphere made it easy to ask questions, share insights, and learn from others during the sessions and in informal settings.

One of the most memorable aspects of the experience was connecting with people from around the world. Meeting not only the esteemed lecturers but also enthusiastic participants broadened my perspective and created opportunities for future collaboration. For anyone passionate about biometric identity recognition, this summer school is an excellent opportunity to gain knowledge and meet some of the brightest minds in the field.

The location of the event was another standout feature. It was surrounded by natural beauty and provided the perfect environment to relax and recharge after intense learning sessions. This balance between academic focus and relaxation made the experience productive and enjoyable.

For future editions, I would suggest incorporating more workshops or panel discussions. These formats proved to be incredibly engaging and allowed participants to explore topics in greater depth.

Overall, the summer school was an exceptional experience that significantly enriched my academic journey. It is an event I highly recommend to anyone seeking inspiration, knowledge, and connections in the biometrics community.

A Report on the Biometrics Summer School Experience

by Filip Pleško (IAPR Summer School Grant Recipient)

Attending the 21st International Summer School for Advances in Biometric Authentication in Alghero, Italy, was a transformative experience for me as a first-year PhD student. The opportunity came to my attention through a recommendation from a friend who had attended the summer school two years prior. Their enthusiastic description of the program, combined with my own need to explore research ideas and establish academic connections, made me eager to apply.

Upon arriving in Alghero, I was immediately struck by the beautiful setting of the summer school. The program was hosted in a picturesque hotel in Sardinia, providing a perfect environment to both learn and relax. The stunning location added a sense of tranquility and focus, helping me to fully engage with the week-long program.

The organization of the school was impeccable, with lectures spaced in such a way that they allowed for intellectual engagement without fatigue. Each session brought new insights into the field of biometric authentication, a topic I had only begun to explore. I was particularly drawn to the diverse approaches and methodologies discussed, which sparked several ideas for my future research. The balance between theoretical discussions and practical applications was inspiring, as it demonstrated the relevance of biometrics in solving real-world problems.

One of the most rewarding aspects of the summer school was the chance to meet and network with fellow researchers. The atmosphere was collegial, and I found it easy to connect with others who shared my interests. I formed friendships and professional connections that have since proven invaluable. In fact, I have already reconnected with some of the participants in subsequent research endeavors, which highlights the importance of such events for fostering collaboration.

Attending the summer school helped me refine my research direction and provided me with a clearer understanding of the critical questions and methodologies in the field. The experience has motivated me to explore interdisciplinary approaches in my work and has significantly broadened my academic horizons.

Overall, I left the summer school feeling inspired and equipped with new ideas and a growing network of collaborators. I am deeply grateful for the opportunity to participate in this program and would highly recommend it to other young researchers seeking inspiration and connection in the field of biometrics.

GRAPHADON 2024

June 24 to June 28 at INSA Rouen Normandy, France

The objective of GRAPHADON2024 was to provide an overview of the approaches used to process data on graphs. Each of five days at the school focused on one approach and the types of data associated with it. Mornings were devoted to introductory courses on the subject, and afternoons were dedicated to more specific courses, practical sessions or workshops.

The numerous themes addressed allowed participants to gain a comprehensive view of the various scientific disciplines interested in graphs for data processing. A real effort was made by the speakers to simplify content. Program assessment showed that practical sessions and tutorials were highly appreciated and allowed participants to better understand concepts covered during the day. Students' ratings of overall satisfaction with the summer school averaged 9.1 on a 10-point scale, where 0 was not satisfied and 10 was very satisfied.

Participants at GRAPHADON 2024 comprised 10 staff members, 18 speakers, 27 PhD students, 3 Post doctorates, and 19 Researchers. Not including staff members, participants came from France (61), Morocco (2), Gabon (1), Norway (1), Italy (1, invited speaker), and Germany (1, invited speaker). Participants from Morocco and Gabon received IAPR grants. The school was also supported by the CNRS (National Center for Scientific Research) and local institutions.

Monday, June 24, 2024

The morning session addressed graph problems, their complexity, and conveying the intuition that even NP-complete problems can be approached with tractable solutions. Classic algorithms for graph coloring and approximation for the traveling salesman problem were presented. Feedback on this presentation was very positive.

In the early afternoon, more advanced algorithmic strategies, corresponding to the current state of the art, were presented through adapted examples. We discussed, in particular, how to adapt algorithms for trees into dynamic programming algorithms for graphs with bounded treewidth, as well as methods based on the existence of kernels.

In the late afternoon, Arnaud de Mesmay's presentation demonstrated how the planarity of graphs significantly changes the landscape for several problems and how this generalizes to graphs embeddable in surfaces of bounded genus. This presentation allowed us to revisit concepts from previous presentations and apply them more precisely, showcasing recent and groundbreaking results in graph algorithms.

The day's schedule thus allowed us to see the most common algorithmic tools, with a progression from the most educational examples to the latest results in the field, enabling everyone to deepen their knowledge and gain insight into current research questions. Participants' satisfaction ratings for the day averaged 8.31.

Tuesday, June 25, 2024

This day, dedicated to semantic graphs, aimed to demonstrate the value of modeling using graphs that integrate spatial, temporal, and semantic dimensions.

The first presentation by Géraldine Del Mondo laid the groundwork for the day by explaining what is meant by ”modeling real phenomena using graphs.” An introduction to the general principles related to this type of modeling highlighted the semantic aspects that need to be preserved to best express reality in the model. The course presented various modeling possibilities through diverse examples, interspersed with Wooclap QCMs to engage the audience.

The second presentation by Auréie Le Borgne focused on the use of semantic graph models, particularly spatiotemporal graph models, in two different fields: functional MRI (medical field) and land use (environmental field). This presentation aimed to bridge the gap between the field of semantic graphs and more data science-oriented approaches, showing that the latter complements the former.

The day concluded with a “state of the art” presentation by Christophe Claramunt, who reviewed numerous models, showing their evolution and impact across many scientific fields. Participants’ satisfaction ratings for the day averaged 8.67.

Wednesday, June 26, 2024

Dynamic Graphs Day began with a presentation by Mathilde Vernet, an associate professor at the LIA Laboratory of the University of Avignon, who introduced the challenges of integrating the temporal dimension into graph studies. David Ilcinkas, a researcher at the CNRS at LaBRI in Bordeaux, then explored the links between distributed algorithms and dynamic graphs.

In the afternoon, Yoann Pigné, a professor at the University of Le Havre Normandie at the LITIS laboratory, led a practical workshop on the Graph-Stream library for manipulating dynamic graphs. The day concluded with a tutorial session on distributed algorithms applied to dynamic graphs, led by Frédéric Guinand, also a professor at the University of Le Havre Normandie at the LITIS Laboratory.

Throughout the day, participants gained a better understanding of dynamic graphs and techniques for analyzing them, and are now better equipped to integrate these concepts into their own research problems. Participants’ satisfaction ratings for the day averaged 8.8.

Thursday, June 27, 2024

This day consisted of two courses on graph signal processing (GSP) in the spectral domain and the nodal domain.

Pierre Borgnat (DR CNRS at ENS Lyon and LIP UMR CNRS 5672) provided an overview of the advances made in recent years for signal processing on graphs in the spectral domain. The adaptation of the Fourier transform on graphs is the cornerstone, and this has allowed the adaptation of new tools for filtering, interpolation, denoising, or multiscale decompositions of signals on graphs such as wavelets. Julie Cologner (CR INRIA at IRISA) then presented on graph signal processing for interpreting and decoding brain activity by integrating connectivity. Brain connectivity is represented as a graph, and GSP allows for the interpretation of brain activity to classify different diseases such as depression and anxiety.

Olivier Lézoray (PR at the University of Caen Normandie and GREYC UMR CNRS 6072) drew parallels between non-local image processing and filtering on a grid graph, then showed how the nodal processing of signals on graphs can be exploited to adapt the resolution of many inverse problems on graphs, through priors such as GLR (Graph Laplacian Regularizer) and GTV (Graph Total Variation). This was followed by a presentation by Hugo Raguet (Assistant Professor at the University of Tours and LIFAT) on the CutPursuit algorithm, which is particularly effective for minimizing energy defined on a graph, and whose solutions exhibit

a form of structured sparsity. Applications to very large 3D point clouds illustrated the interest of this algorithm.

A practical session presented an overview of the elements covered during the day, from graph construction to GFT/GLR/GTV and their applications for filtering signals on graphs. Participants' satisfaction ratings for the day averaged 9.2.

Friday, June 28, 2024

The GRAPHADON2024 Summer School dedicated a day to "Graphs and Machine Learning." Supported by the CNRS, this day brought together various researchers to present the foundations and challenges of this field, with theoretical sessions and practical workshops.

The morning began with Marc Lelarge, who introduced the basics of representation learning on graphs, highlighting the specific challenges related to modeling complex data and their relationships. Benoit Gaüzére and Guillaume Renton then led a workshop on PyTorch Geometric, allowing participants to develop and train neural networks on graphs for chemical molecules.

In the afternoon, Pasquale Foggia demonstrated the application of graph neural networks (GNNs) to cybersecurity, showing how these graphs can detect anomalies in network traffic and identify vulnerabilities in source code. Linlin Jia concluded the day by exploring the links between various graph machine learning methods, such as graph kernels and edit distances, and presenting new algorithms for predicting molecular properties.

This day provided participants with a deep understanding of the challenges and opportunities of machine learning on graphs, combining theory and practice. Participants' satisfaction ratings for the day averaged 9.1.

An international workshop (IAPR-GbRPR 2025) will be organized in June 2025 in Caen, covering themes from the school. In parallel, the NormaSTIC federation, through Luc Brun and Géraldine Del Mondo, will organize internal days within the federation, covering two of the themes addressed during the school. There are currently no plans to renew the school in 2025.

Report Submitted by

Luc Brun and
Géraldine Del Mondo

GRAPHADON 2024

Professor-participant Report

A Report on the GRAPHADON Summer School Experience

by Anass Nouri (IAPR Summer School Grant Recipient)
translated from French by Luc Brun

I had the opportunity to participate in a summer school specializing in signal processing on graphs, organized by INSA Rouen. This training allowed me to strengthen my fundamental knowledge in this field and discover its many applications. The summer school covered a wide range of topics, from theoretical concepts to practical work, with hands-on exercises associated with various applications of signal processing on graphs.

One of the highlights of this experience was the introduction to an emerging research area: deep learning on graphs. Through practical workshops and concrete examples, I was able to understand how this innovative technology is transforming the processing of unstructured data. These hands-on exercises allowed the implementation of advanced concepts, thus reinforcing my understanding of modern tools applied to graphs.

The school also explored various applications of signal processing on graphs, highlighting its utility in fields ranging from data analysis to imaging, while illustrating concrete use cases. This multidimensional approach provided a comprehensive view of the capabilities of this discipline, emphasizing its potential in diverse fields such as social networks and 3D image processing. It turns out that it aligns perfectly with my research in the field of 3D mesh analysis through graphs!

I am particularly grateful to the IAPR, which granted me a scholarship to participate in this enriching event. Indeed, without this financial aid, I would not have been able to attend this summer school. A huge thank you once again. This opportunity not only consolidated my knowledge in the field of signal processing on graphs but also broadened my research perspectives by familiarizing me with innovative approaches such as deep learning on graphs. This experience represented a significant step in my academic and professional development, providing me with the skills necessary to further explore this ever-evolving field. A big thank you and congratulations to the entire organizing team and all the speakers.

For the future, of course, other summer (or winter) schools would be welcome for a broader dissemination of the skills developed in the field of graphs. I hope this will be the case.

Maitre de conférences - HDR
Université Ibn Tofail

GRAPHADON 2024

Professor-participant Report

جامعة ابن طفيل
Ibn Tofaïl University
Faculté des Sciences

Prof. El Bachir Ameur
IAPR Summer School Grant Recipient

RE: Participation report in the GRAPHADON Summer School

I had the pleasure of participating in the GRAPHADON Summer School on Graphs and Data Analysis, held from June 24 to 28, 2024, at INSA Rouen in France. I discovered GRAPHADON during my internet search for summer schools focusing on Graph Neural Networks (GNNs), a rapidly evolving field within deep learning. This school provided a unique opportunity to deepen my knowledge about graphs and their applications, as well as to explore the latest advancements in this field. The sessions were particularly rich and covered key topics such as semantic graphs, dynamic graphs, signal processing on graphs, and applications of graphs in artificial intelligence. My interest in this domain aligns closely with my future research projects, particularly in exploring graph structures and their diverse applications.

During my time at GRAPHADON, I had the opportunity to learn from highly skilled teachers and researchers specializing in graph theory and its numerous applications. The program emphasized the importance of graph structures in various domains. Specifically, GNNs have proven to be essential tools in modern machine learning challenges due to their ability to model and process complex relational data. In my current research, graph-based approaches play a key role in applications such as developing deep learning models for steganalysis and digital watermarking: detection of hidden information in multimedia support; and classification and fraud detection in document images.

The school provided essential insights and advanced techniques on the use of graphs and their use in deep learning models, and has enriched my perspective on applying graphs in various contexts. In addition to the learning sessions, GRAPHADON facilitated the establishment of new scientific collaborations. Notably, I had fruitful discussions with Professor Luc Brun, focusing on EEG signal annotation and neurological disease detection using deep learning approaches based on GNN. These discussions pave the way for new multidisciplinary collaborative research opportunities.

The organization of GRAPHADON was exemplary, with a well-structured program and remarkable punctuality from the participants. The continuous engagement of attendees throughout the sessions reflects the quality of the content and the attractiveness of the school. My suggestion for future editions is to introduce oral or posters sessions for participants to share their work. This would enrich debates and stimulate discussions around ongoing research.

Participating in GRAPHADON was a highly enriching experience both academically and professionally. It allowed me to deepen my understanding of graphs and GNNs while establishing valuable connections for future collaborations. I strongly encourage researchers interested in this field to take part in such initiatives to accelerate their scientific progress.

~Prof. El Bachir Ameur, Dept. of Computer Science, Ibn Tofaïl University, Kenitra, Morocco

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Meeting and Education Planner

Month	Days	Meetings, Workshops & Schools	Previous edition & link to Report	Venue	Paper/ Application Deadline (SEE ALSO)
= Sponsored by IAPR		**2025**			
Feb	23-25	ROBOVIS 2025 5th International Conference on Robotics, Computer Vision and Intelligent Systems	2024	Porto **Portugal**	closed
	23-35	VISAPP 2025 20th International Conference on Computer Vision Theory and Applications	2024	Porto **Portugal**	closed
	23-25	ICPRAM 2025 14th International Conference on Pattern Recognition Applications and Methods	2024	Porto **Portugal**	closed
June	25-27	GbR 2025 14th IAPR TC15 Workshop on Graph-based Representations in Pattern Recognition	2023	Caen **France**	Feb 18 2025
	25-28	MCPR 2025 17th Mexican Conference on Pattern Recognition	2024	Guanajuato **Mexico**	Jan 31 2025
June-July	30-3	IbPRIA 2025 12th Iberian Conference on Pattern Recognition and Image Analysis	2024	Coimbra **Portugal**	Feb 14 2025
July	26-28	MVA 2025 (website in development) 19th International Conference on Machine Vision Application	2023	Kyoto **Japan**	Mar 31 2025
Sept	15-19	ICIAP 2025 23rd International Conference on Image Analysis and Processing	2019	Rome **Italy**	Feb 1, Apr 15 2025
	17-21	ICDAR 2025 19th International Conference on Document Analysis and Recognition	2023	Hubei **China**	Feb 21 2025
Dec	1-4	ICPRS 2025 - The 15th International Conference on Pattern Recognition Systems	2024	Vina Del Mar **Chile**	Aug 1 2025
		2026			
Aug	16-20	ICPR 2026 - 28th International Conference on Pattern Recognition	2022	Lyon **France**	TBD

IAPR NEWSLETTER SUBMISSION DEADLINES FOR APRIL 2025

Sunday	Monday	Tues	Wed	Thurs	Friday	Saturday
Mar 30	Mar 31 *Invited Next Generation Essay Due*	Apr 1	Apr 2	Apr3	Apr 4 *Invited Getting to Know IAPR Fellow Essay Due*	Apr 5
Apr 6	Apr 7 *New ads, plus...* ***All Meeting Reports! ALL Meeting Reports! ALL MEETING REPORTS***	Apr 8	Apr 9	Apr 10	Apr 11 *Standing Committee Columns/News; Technical Committee News; Changes to existing ads*	Apr 12
Apr 13	Apr 14 *From the ExCo Essay and News Points*	Apr 15	Apr 16	Apr 17	Apr 18 *Conference Calls for Papers, Proposals, & Applications*	Apr 19
Apr 20 through April 26: ***Final Copy Draft and Review Week (New materials can no longer be accepted)***						
Apr 27	Apr 28 *Publication Day (Planned)*	Apr 29	Apr 30	Mar 1	Mar 2	Mar 3

Wondering when to send new or unlisted content? Please contact the Layout Editor by Mar 15, 2025

THE INTERNATIONAL ASSOCIATION FOR PATTERN RECOGNITION
IAPR Newsletter

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Please email comments or ideas to EiC or LE! Thank you!