2022 The 15th International Conference on Machine Vision
ICMV 2022

CONFERENCE PROGRAM

Hybrid Conference

Rome, Italy
18-20 November, 2022

WELCOME ADDRESS

On behalf of the Organizing Committee group, we are very pleased to welcome you all to join 2022 The 15th International Conference on Machine Vision (ICMV 2022), to be held in Rome, Italy, during November 18-20, 2022. ICMV conference is initiated by School of Electronics, Si Chuan University, China, assisted by University of Stuttgart, Germany, Halmstad University, Sweden, University of Barcelona, Spain, Institute for Information Transmission Problems, Russia, The Sapienza University of Rome, Italy.

After several rounds of review procedure, the program committee accepted those abstracts to be presented on conference, and papers to be published in conference proceedings. We wish to express our sincere appreciation to all the individuals who have contributed to ICMV 2022 conference in various ways. Special thanks are extended to our Special Session Chairs (Prof. Wolfgang Osten, Prof. Peter Corcoran, Prof. Alessia Cedola, Prof. Andrey Kuznetsov, etc.) organized excellent session with interesting and professional topic, which attracts lots of papers to join, to committee members for their thorough review of all the submissions, which is vital to the success of the conference, and also to the members in the organizing committee and the volunteers who had dedicated their time and efforts in planning, promoting, organizing and helping the conference.

After online conferences for two years owing to the global pandemic situation, this year with great efforts from our organizing committee group, ICMV 2022 onsite participation finally comes true. It will be so amazing and exciting to welcome you in Rome this year face to face. Considering the pandemic prevention and travel restrictions differ in areas, still we have lots of delegates have no choice but choose online presentation.

ICMV 2022 conference program is high lightened by three Keynote Speakers and one Invite Speaker, they are:

Prof. Pietro Ferraro, Institute of Applied Sciences & Intelligent Systems Campi Flegrei, Italy;
Prof. Zhongfei (Mark) Zhang, State University of New York at Binghamton, USA;
Prof. Dr. Rolf-Jürgen Ahlers, ProxiVision GmbH, Germany;
Dr. Frank Elandaloussi, Founder of Syperion GmbH & Co KG, Germany.

One best presentation will be selected from each session, evaluated from: originality; applicability; technical Merit; qualities of PPT; English. The best one will be announced at the dinner time on Nov. 19 and closing ceremony on Nov. 20.

Rome (or Roma in Italian) is the capital of Italy and has a population of 2.8 million, the Romans. According to legend, Rome was founded by the twins Romulus and Remus in 753 BCE. The city is located on the banks of the river Tiber and was founded on top of seven hills; Palatine Hill, Aventine Hill, Capitoline Hill, Caelian Hill, Esquiline Hill, Quirinal Hill and Viminal Hill. Particularly the area around Palatine Hill and Capitoline Hill would later become the centre of power of the enormous Roman Empire. You can find many ruins and excavations here of the Forum Romanum and the Colosseum gives you an impression of how gladiators had to do battle in this enormous Roman amphitheatre. The Pantheon, which is now a church, has its characteristic round, open roof and is one of the best kept buildings from Roman times. And the Via Appia takes you back in time along one of the oldest roads of Rome Italy. Basically, the city of Rome is one giant museum. It is therefore no surprise that the complete historic city centre is on the UNESCO World Heritage List.

We wish you have a nice experience and enjoy this conference!

Sincerely yours,
ICMV 2022
International Organizing Committees

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CONFERENCE VENUE

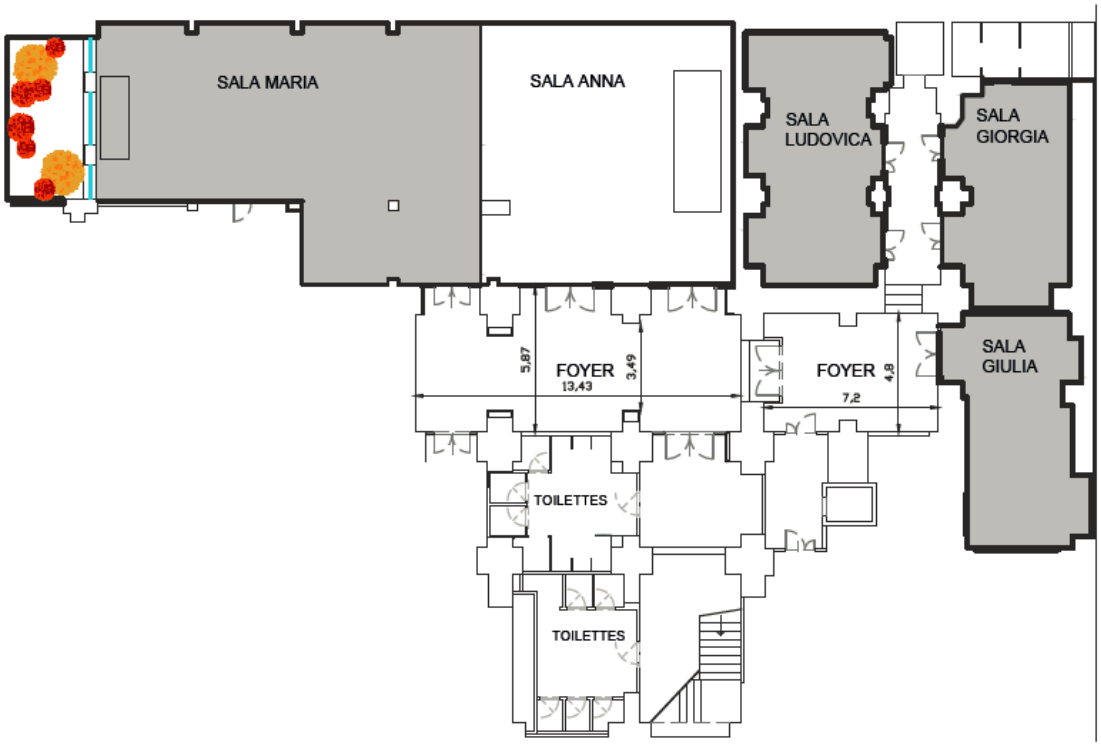
Best Western Plus Hotel Universo

Address: *Via Principe Amedeo, 5/b 00185 Roma, Italy*
Contact: *Oksana Vasylieva,* Tel. : *+39 06 448 7542*
Website: *https://www.hoteluniverso.com/en/*
Click Here for Google Map>>

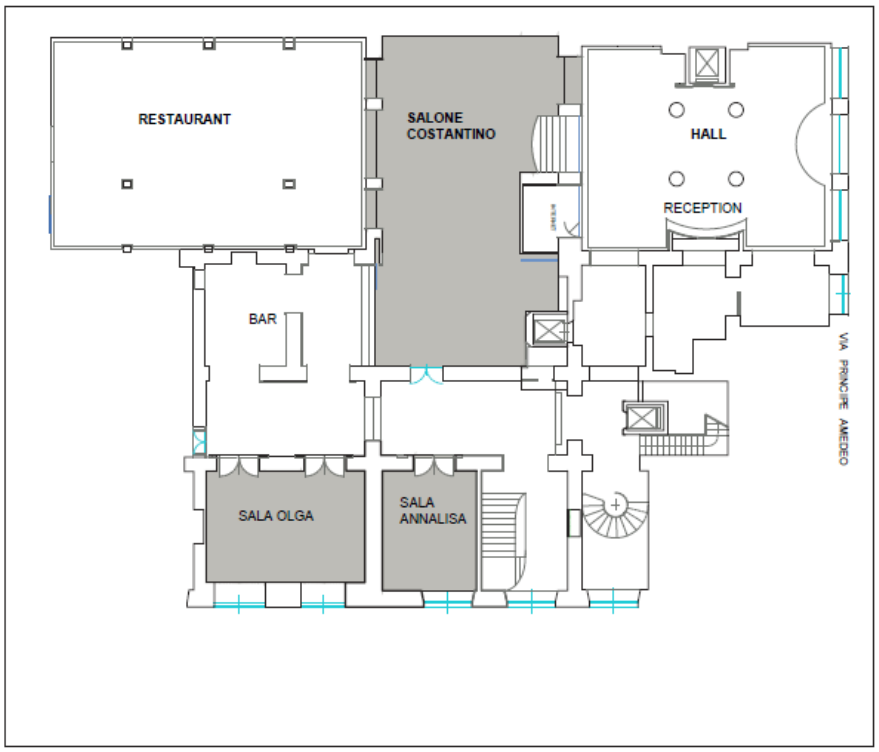
Day 1(Nov. 18) morning: Onsite Registration near SALA LUDOVICA
Day 1(Nov. 18) afternoon: Opening Remarks, Keynote Speeches, Invite speech @ SALA LUDOVICA
Day 2(Nov. 19): Hybrid Sessions @SALA GIORGIA+SALA ANNALISA

Meeting Rooms Floor Map:

Planimetria Seminterrato/ *Basement Conference Plan*



Planimetria Piano Terra / *Ground Floor Conference Plan*



Tips: *Conference will provide ***onsite meeting room*** **on** ***Nov. 18 afternoon and Nov. 19*** for onsite attendees, and with ***dinner on Nov. 18***, ***lunch and cocktail banquet on Nov. 19***.

*__No accommodation__ will be provided, please reserve your hotel room in advance if needed, thanks.

*Please take care of your belongings on the conference site, so as to avoid the loss. You will be held personally responsible for any loss of your belongings.

ATTENDEE INSTRUCTIONS

FOR EVERYONE

- The whole conference program is scheduled in ***Rome Time (UTC+1).***
- *Please double check your Presentation Time, and adjust times to device's time zone.*
- ***English*** will be the only language used for presentation;
- ***Nov. 18 Morning: For ZOOM Test (online participants) and Onsite Registration & Materials Collection (onsite participants),***
- ***Nov. 18 Afternoon: Opening Remarks, Program Address, Keynote &Invite Speeches***,
- ***Nov. 19: Hybrid Sessions***,
- ***Nov. 20: Online Sessions &Closing Ceremony.***
- Each Keynote Speech is within ***45Mins,*** and each Invite Speech is within ***30Mins***.
- Each oral presentation is allocated with ***15Mins*** (10~12Mins presentation, 3~5Mins for Q&A), please prepare your English PPT in advance.
- ***Group Photo section*** will be at the afternoon break time on ***Nov. 18***, and there will be group photo time at the end of each session.
- ***One Best Presentation*** will be chosen from each session and announced at the Cocktail banquet on Nov. 19 and at the online closing ceremony on Nov. 20.
- ***Receipts*** will be emailed after the conference.
- ***Formal dresses***.

FOR ONSITE PRESENTERS

- Enter the Session room and meet your Session Chair in advance before the session starts. Try connecting LED projector to check your slides on the screen.
- ***The registration desk*** will be open on Nov. 18 morning (09:30-12:00), for onsite registration and materials collection.
- Session room will be equipped with ***Laptop, LED Projector and laser pointer***. To avoid time consuming it is suggested to try to connect it and try in advance if you plan to use your own laptop.
- Please install *Zoom App* in your computer, to log in at your session and remember to share your onsite presentation to online participants, if you use your own laptop.

FOR ONLINE PRESENTERS

Please prepare:

- Computer with ***working camera*** and ***audio system***;
- ***Stable Internet Connection*** (wired connection is preferable);
- ***Quite place*** with proper lighting;
- ***Unnecessary applications are shut down*** on your computer so all resources are allocated to the Zoom Meeting;
- ***Rename***yourself with Session Number +Paper ID+Name, (*eg. S1+V001+Lily LI*), before entering meeting room.
- If you are ***Conference Chair, Keynote & Invite Speaker or Session Chair***, please ***rename*** yourself with CC +Name, or KN/IS +Name, or SC +Name.
- Enter ***15 Mins prior*** to your session in ZOOM, you cannot connect the meeting until "host"starting it.
- ***Nov. 18*** morning will be ***ZOOM TEST TIME***, to help delegates know better how to use ZOOM, try to ***Share Screen***; ***Rename*** yourself. If you know well how to use ZOOM and no need to test, please email us in advance.
- ***Certificates*** and ***Receipts*** will be emailed after the conference.

Zoom Tool

The online conference will utilize Zoom video conferencing.

1. You could locate the session which you plan to attend and ***click*** on the "***Zoom link***", no password;
2. ***Install Zoom App*** on your computer, "Join a Meeting" by inserting the ***meeting room ID***. (Download from ***zoom.us*** or ***zoom.com.cn***)

***Zoom Meeting ID:**
Room A:
831 8842 0382
https://us02web.zoom.us/j/83188420382
Click here for Zoom Link >
Room B:
861 9358 9476
https://us06web.zoom.us/j/86193589476
Click here for Zoom Link >

PROGRAM OUTLINE

FRI. |18 NOV., 2022 | UTC+1

	Onsite Delegates Registration	Online Delegates Zoom Test	
Time	Venue: *Near Sala Ludovica*	Zoom ID: *831 8842 0382*	Zoom ID: *861 9358 9476*
09:30-10:30	Conference Materials Collection	----------	Online Presenters
10:30-11:00		*Break*	
11:00-12:00		Online Keynote Speaker & Session Chairs	Online Presenters

Room: *Sala Ludovica* Zoom meeting ID: *831 8842 0382* *(In Hybrid)*	
Time	**OPENING CEREMONY**
14:00-14:05	Opening Remarks By **Prof. Wolfgang Osten** *University of Stuttgart, Germany*
14:05-14:10	Program Address By **Prof. Dmitry Nikolaev** *Institute for Information Transmission Problems, Russia*
	KEYNOTE& INVITE SPEECHES
	Chair: **Prof. Dorra Sellami** University of Sfax, Tunisia
14:10-14:55	**Keynote Speech I:** "Small Can Be Powerful" By **Prof. Zhongfei (Mark) Zhang** *State University of New York at Binghamton, USA*
14:55-15:40	**Keynote Speech II:** "Tomographic Flow Cytometry by Digital Holography: Perspectives in Computational Microscopy and 3D Visualization" By **Prof. Pietro Ferraro** *Institute of Applied Sciences & Intelligent Systems Campi Flegrei, Italy*
15:40-16:15	*Group Photo& Afternoon Break*
	Chair: **Prof. Wolfgang Osten** *University of Stuttgart, Germany*
16:15-17:00	**Keynote Speech III:** "From Pixel to Knowledge – The Paradigm Shift in Image Processing and Machine Vision" By **Prof. Rolf-Jürgen Ahlers** *ProxiVision GmbH, Germany*
17:00-17:30	**Invite Speech:** "Transformation of Point Cloud Data to Process Information for Automation in Open Cast Mining" By **Dr. Frank Elandaloussi** *Founder of Syperion GmbH & Co KG, Germany*
17:40-19:30	*Dinner @ Restaurant*

SAT. |19 NOV., 2022 | UTC+1
(In Hybrid)

	Onsite Room: *Sala Giorgia* Online Zoom ID: *831 8842 0382*	Onsite Room: *Sala Annalisa* Online Zoom ID: *861 9358 9476*
09:30-11:30	**Special Session I** *Machine Vision for Autonomous Vehicles*	**Special Session II** *Machine Vision based Stress, Cognition, and Emotion Sensing in Driver/Occupant Monitoring Systems*
11:30-13:30	*Lunch @ Restaurant*	
13:30-15:15	**Technical Session 1** *Image detection and segmentation*	**Technical Session 2+Special Session III** *Image Reconstruction and Computer Aided Imaging Technology (Advanced Imaging and Tomography)*
15:15-15:45	*Afternoon Break*	
15:45-17:30	**Technical Session 3** *Digital image analysis and method*	**Technical Session 4** *Image classification and encryption*
17:40-19:30	*Cocktail Banquet @ Restaurant*	

SUN. |20 NOV., 2022 | UTC+1
(Online Only)

Time	Online Zoom ID: *831 8842 0382*	Online Zoom ID: *861 9358 9476*
10:00-12:00	**Technical Session 5** *Target detection and tracking*	**Technical Session 6+Special Session IV** *Image recognition and image model (New Methods and Applications for Multimedia Security)*
12:00-14:00	*Lunch Break*	
14:00-15:45	**Technical Session 7** *Image and signal analysis*	**Technical Session 8** *Computer Aided Imaging and Systems*
16:10-16:25	**Closing Ceremony** *(online)*	

OPENING REMARKS

Friday, 14:00-14:05, Nov. 18. 2022 (UTC+1)
Meeting Room: Sala Ludovica
ZOOM ID: 831 8842 0382

General Chair

Wolfgang Osten
University of Stuttgart, Germany
Professor

BIO: *About Prof. Wolfgang Osten: he received the MSc/Diploma in Physics from the Friedrich-Schiller-University Jena in 1979. From 1979 to 1984 he was a member of the Institute of Mechanics in Berlin working in the field of experimental stress analysis and optical metrology. In 1983 he received the PhD degree from the Martin-Luther-University Halle-Wittenberg for his thesis in the field of holographic interferometry. From 1984 to 1991 he was employed at the Central Institute of Cybernetics and Information Processes ZKI in Berlin making investigations in digital image processing and computer vision. Between 1988 and 1991 he was heading the Institute for Digital Image Processing at the ZKI. In 1991 he joined the Bremen Institute of Applied Beam Technology (BIAS) to establish and to direct the Department Optical 3D-Metrology till 2002. Since September 2002 he has been a full professor at the University of Stuttgart and director of the Institute for Applied Optics. From 2006 till 2010 he was the vice rector for research and technology transfer of the Stuttgart University where he is currently the vice chair of the university council. His research work is focused on new concepts for industrial inspection and metrology by combining modern principles of optical metrology, sensor technology and image processing. Special attention is directed to the development of resolution enhanced technologies for the investigation of micro and nano structures.*

PROGRAM ADDRESS

Friday, 14:05-14:10, Nov. 18. 2022 (UTC+1)
Meeting Room: Sala Ludovica
ZOOM ID: 831 8842 0382

General Co-Chair

Dmitry Nikolaev
Institute for Information Transmission Problems, Russia
Professor

BIO: *Prof. Dmitry Nikolaev was born in Moscow, Russia. He obtained his Master degree (in physics) in 2000 and Ph.D. degree (in computational methods of image processing) in 2004 from Moscow State University. Since 2007 he is a head of the Vision Systems Lab. at the Institute for Information Transmission Problems, RAS. His research activities are in the areas of computer vision with primary application to color image understanding. Since 2005 he gives a course "Image processing" in the Moscow Institute of Physics and Technology, take up an appointment of Assoc. Prof in 2008. At 2015 he has more than 120 publications.*

KEYNOTE SPEAKERS

Friday, 14:10-14:55, Nov. 18. 2022 (UTC+1)
Meeting Room: Sala Ludovica
ZOOM ID: 831 8842 0382

Keynote Speaker I

Zhongfei (Mark) Zhang

Binghamton University, State University of New York, USA
Professor

TOPIC: Small Can Be Powerful

Abstract: Learning with knowledge distillation is a hot topic in today's machine learning literature, with the motivation of equipping a student, typically much lighter-weight network with the knowledge from a teacher, typically much larger network. This research has a wide spectrum of real-world applications of developing powerful but light-weight and resource-limited front end devices. In the existing literature, typically the student always underperforms the teacher after knowledge distillation and this is attributed as a result of the typical huge capacity gap between the teacher and the student. In this talk, I will examine the problem of the performance gap between the teacher and the student from a different perspective --- distillation data, and I will show through theoretic analysis and empirical evaluations that even with the existence of the huge capacity gap, as long as the student is large enough, with appropriate distillation data, the student can be made to exhibit the same performance as that of the teacher, and can even outperform the teacher.

BIO: *Zhongfei (Mark) Zhang is a professor at Computer Science Department, Binghamton University, State University of New York (SUNY), USA. He received a B.S. in Electronics Engineering (with Honors), an M.S. in Information Sciences, both from Zhejiang University, China, and a PhD in Computer Science from the University of Massachusetts at Amherst, USA. He was on the faculty of Computer Science and Engineering at SUNY Buffalo, before he joined the faculty of Computer Science at SUNY Binghamton. He is the author or co-author of the very first monograph on multimedia data mining and the very first monograph on relational data clustering. He has published over 200 papers in the premier venues in his areas. He holds more than thirty inventions, has served as members of organization committees of several premier international conferences in his areas, and as editorial board members for several international journals. He served as a French CNRS Chair Professor of Computer Science at the University of Lille 1 in France, a JSPS Fellow at Chuo University in Japan, a QiuShi Chair Professor at Zhejiang University in China, as well as several visiting professorships at many universities and research labs in the world when he was on leave from Binghamton University years ago. He received many honors including SUNY Chancellor's Award for Scholarship and Creative Activities, SUNY Chancellor's Promising Inventor Award, and best paper awards from several premier conferences in his areas. He is a Fellow of IEEE, IAPR, and AAIA.*

Friday, 14:55-15:40, Nov. 18. 2022 (UTC+1)
Meeting Room: Sala Ludovica
ZOOM ID: 831 8842 0382

Keynote Speaker II

Pietro Ferraro
Institute of Applied Sciences & Intelligent Systems Campi Flegrei, Italy
Professor

TOPIC: Tomographic Flow Cytometry by Digital Holography: Perspectives in Computational Microscopy and 3D Visualization

Abstract: A novel tomographic technique based on flow-cytometry (FC) and digital holography is reported and discussed. Such holographic tomography (HT) in FC is capable to furnish 3D visualization and quantifications of the entire cell. Moreover, it is possible to detect and quantify intracellular structures. The method opens the way for accurate measurement at single cell level and with high-thruput mode for different application such as disease diagnosis, nanoparticle-drug vectors and examination of cell functionalities. Experiments and processing methods will be described and illustrated while several example of results will be presented. Computational related issues, that are of fundamental importance in processing 3D tomograms and their 3D visualization of the phase-contrast tomograms, will be reviewed while future foreseen perspectives will be given.

BIO: *Dr. Pietro Ferraro received the doctor of Physics degree, summa cum laude, from the University of Napoli "Federico II", Italy, in 1987.*
Soon after he joined Aeritalia-Alenia Aeronautics (the major Aerospace company in Italy) as researcher to develop applied research in Optical Non-Destructive Testing of carbon fiber materials. He has been Principal Investigator (PI) (1991-1993) on behalf of Composite Materials Research Center of Alenia for two R&D Projects in the frame of a Cooperative Research And Development Agreement (CRADA) between Finmeccanica (Roma) and United Technologies Research Center, Electronics & Photonics Group (Directed by Dr. A.J. De Maria), East Hartford, CT (USA).
The two research projects were on "Non destructive testing of large composite aircraft structures by Holography methods" (PI for UTRC Dr. Karl A. Stetson) and "Fiber Optic Bragg Grating Sensors" (PI for UTRC Dr. J. R. Dunphy). During this cooperation he contributed to pioneering work on Fiber Bragg Grating for strain sensing, development of related instrumentations and optical fiber emebedding process in composite materials for which 3 patents were awarded jointly to Finmeccanica and UTRC. In 1993 he joined Consiglio Nazionale delle Ricerche (CNR) Optics Group at Institute of Cybernetics, Pozzuoli (Napoli), Italy as Associate Researcher to develop interferometric and holographic methods for testing and characterization of optical components and materials. In 2001 he joined as Researcher the CNR–Institute of Microelectronics and Microsystems, Napoli. In 2003 he joined National Institute for Applied Optics (INOA) as Senior Research Scientist. Since 2005 he is Head of the Research Line and Group on behalf of CNR in Optical diagnostics, Interferometric and Microscopy.

Friday, 16:15-17:00, Nov. 18. 2022 (UTC+1)
Meeting Room: Sala Ludovica
ZOOM ID: 831 8842 0382

Keynote Speaker III

Rolf-Jürgen Ahlers
ProxiVision GmbH, Germany
Professor

TOPIC: From Pixel to Knowledge – The Paradigm Shift in Image Processing and Machine Vision

Abstract: In the past 50 years the activities in the Vision area changed from image processing to machine vision. Taking into account the transition from pure data processing to cognitive, intelligent behaviour.
Today we take as granted topics like artificial intelligence, neural nets, big data etc. But we do not always deal with the consequences given by these developments.

The presentation deals with the development during these 50 years and how the topics changed with regard to the success of special applications, be it e.g. for measurement purposes, robot integration or even process control.
In the automotive sector as well as in the aerospace domain, the life science technologies etc. we have reached an astonishing level of integration we did not expect to show up that fast. On the other hand, intelligent behaviour, the copy of human skills, is far from being achieved in a reliable and resilient manner.
Today it is essential to be aware of the challenges by dealing with these technologies, and the achievements reached.

Do we really feel certain to answer the question: “Is everything under control?” with the answer: “Yes, we are!”

BIO: *Prof. Dr. Rolf-Jürgen Ahlers studied Electrical Engineering and Physics in Stuttgart, Germany. He received his diploma in 1978 and finished his dissertation (PhD) in 1986 at the University of Stuttgart.*
In 1977 he joined the ENST (Ecole Nationale Supérieure de Télécommunication) in Paris, France. Here he worked as a scientific member for the development and integration of holographic optical and computer systems for adaptive image processing.
From 1984 until 1989, he joined the Fraunhofer-Institute for Production Technology and Automation (IPA), Stuttgart, Germany, where he developed image processing and sensor systems for diverse applications in industry. The main topics related to Industrial Robots for Measurement Tasks, specific measurement and inspection systems, as well as autonomous mobile systems. Under his leadership the first 3D- coordinate measurement systems were developed for precision measurement tasks.
His industrial career started in 1990 in the automotive supply industry. He then got involved in the aeronautics and defence industry where he is today the CEO and shareholder of the companies ProxiVision GmbH and ASG Luftfahrttechnik & Sensorik GmbH. Here the main emphasis relates to the development and manufacture of new sensor and image processing systems. These include the development and realisation of Image Intensifiers, Photo-Mulitpliers, and opto-electronic sensors and sensor systems as they are needed in the life science, process industry and mobility sectors.
Prof. Ahlers has published books and papers and given workshops, especially on image processing, sensor systems, and related topics.
Prof. Ahlers is engaged in different organisations and associations. He holds the position of a Senator of the AiF (Association of Industrial Research, Arbeitsgemeinschaft industrieller Forschungvereinigungen „Otto von Guericke“e.V.) in Berlin. He is the industrial vice president of Steinbeis Research and Technology Organization, Stuttgart, Germany, the President of the Aerospace Forum Baden Württemberg (Forum LR BW e.V.), and a Member of the Board of UBW (Unternehmer Baden-Württemberg, Association of Entrepreneurs) and furthermore he is the Chairman of the Research, Technology and Innovation working group at UBW.
In Brussels, he is a member of the Supply Chain Commission at ASD (AeroSpace and Defence Industries Association of Europe).
Since 2011, he holds the professorship at the Technical University of Darmstadt, Germany.

INVITE SPEAKER

Friday, 17:00-17:30, Nov. 18. 2022 (UTC+1)
Meeting Room: Sala Ludovica
ZOOM ID: 831 8842 0382

Invite Speaker

Frank Elandaloussi
Founder of Syperion GmbH & Co KG, Germany
Doctor

TOPIC: Transformation of Point Cloud Data to Process Information for Automation in Open Cast Mining.

Abstract: Open cast mines are a harsh production environment influenced by weather and the production itself. The use of scanners using LIDAR (Light detection and ranging) is known as one technique to measure the shape and reflections of objects. Scanners acquire millions of 3D measurement points within seconds. The main question is how to interpret these huge amount points to abstract the data towards information which can be used for automations purpose. One approach is the use of 'GridPoints' which significantly reduce the number of points but preserve the relevant process information. This allows the automation of excavators, stackers, reclaimers, and spreaders. This publication shows the challenges in using LIDAR in open cast mines, introduce the 'GridPoints' approach for gaining process information out of point cloud data and gives examples of application.

BIO: *Dr.-Ing. Frank Elandaloussi studied electrical engineering at the University of Bremen with a focus on automation technology. After graduating, he worked in the USA on a project for NASA, among others. In 2002 he received his doctorate at the Bremen Institute for Applied Beam Technology in the field of optical metrology. Since 1994, he has been working on projects for opencast mining and the aerospace industry, and in 2006 he set up his own business as founder of Syperion GmbH & Co KG. Syperion main emphasis is to generate process values out of LIDAR data to automize and to increase labor safety.*

SPECIAL SESSIONS

Special Session I

Machine Vision for Autonomous Vehicles

The development of autonomous vehicles is a hot topic taken up not only by industry but increasingly by research institutions. The topic is not new. Already in the 80th big research projects such as the European EUREKA project "Prometheus" (PROgraMme for a European Traffic of Highest Efficiency and Unprecedented Safety, 1986–1994) were aimed at finding new solutions for increased road safety. However, the key finding gained almost 30 years ago was not so much an increase in autonomy as improved driver assistance, in order to provide more support to the driver in more complex situations. But new algorithms and implementations of Artificial Intelligence, sophisticated sensors and sensor fusion techniques are currently promising a significant improvement in the reliability of autonomous vehicles. In that context a lot of challenging problems are waiting on an answer. To them belong especially questions directed to changing environmental conditions during the autonomous drive such as rain, fog, snow, and in general difficult visibility conditions. If vehicles are to drive fully autonomously in the future, systems are required which scan the environment with high precision, high spatial and temporal resolution and guarantee the necessary reliability even in these difficult situations.

Today, a wealth of different sensors are integrated and combined. The sensor and data fusion can be described as inadequate in current configurations, since the individual data streams are processed and interpreted in parallel. A combination of the results takes place very late in the process chain. Inadequate results characterized by latency and blurring are the result. The special session is dedicated to that challenge. Various lectures address new approaches for better dealing with such complex situations. To them belong new ways of machine Learning for infrastructure monitoring, new LiDAR sensors for obstacle recognition, and two new sensors for the improvement of object recognition through scattering media.

ORGANIZER:

Chair: **Prof. Wolfgang Osten**, University of Stuttgart, Germany

Special Session II

Machine Vision based Stress, Cognition, and Emotion Sensing in Driver/Occupant Monitoring Systems

The management and transfer of vehicular control between a driver and in-built computational intelligence is a key challenge as the automotive roadmap evolves fully autonomous vehicles. Today we can determine some basic attributes of a driver – analysis of the eye-region enables a determination of drowsiness and gaze. However, the next generation of driven monitoring systems need an improves understanding of the humans within a vehicle – their emotional and cognitive states, their interactions, both with the vehicle itself and between one another, and the levels of driver stress. Today, machine vision can only provide rudimentary solutions, but a fusion of machine vision systems with bio-signals (EEG, heart rate & breathing) and multi-modal imaging, such as thermal vision, can provide a basis for new data-driven machine vision systems that can more accurately and reliably understand the humans in a vehicular environment. This session seeks to explore some of the emerging potential of data-driven machine vision systems in the context of the next generation of non-contact, in-cabin driver monitoring technologies.

ORGANIZER:

Chair: **Prof. Peter Corcoran** (IEEE Fellow), C3I Imaging Centre, College of Science & Engineering, National University of Ireland Galway, Ireland

Special Session III

Advanced Imaging and Tomography

Machine vision is one of the most powerful nondestructive methods of object exploration, but it is limited by object surface. For internal structure analysis (in medicine, geology, quality control, etc.) one requires the methods of tomography. Advanced imaging and tomography track will provide a forum to present and discuss the latest advances and state of the art approaches in tomography. We intend to organize a fruitful exchange of opinions and ideas between specialists in machine vision and tomography, as well as encourage and facilitate interdisciplinary communication amongst university researches and industry professionals involved in tomographic software and hardware development.

ORGANIZER:

Chair: **Prof. Alessia Cedola**, 'Sapienza' University, Italy

Special Session IV

New Methods and Applications for Multimedia Security

Multimedia Security: Methods and Applications which includes watermarking, steganography, and digital forgery detection is oriented on essential principles, technical information, and new methods and algorithms for digital data security. The proposed technologies and solutions are used to prove that content is authentic and has not been altered. Illustrating the need for improved content security as the Internet and digital multimedia applications rapidly evolve, the special session presents a wealth of everyday protection application examples in different fields including multimedia mining and classification, digital watermarking, steganography, digital forensics, deep fake synthesis and detection. The list of covered topics can be applied to digital images, videos, audio and other specific data security.

ORGANIZER:

Chair: **Prof. Andrey Kuznetsov**, Samara National Research University, Russia

Special Session I

Hybrid

Machine Vision for Autonomous Vehicles

SESSION CHAIR: Prof. Wolfgang Osten, *University of Stuttgart, Germany*

Nov. 19, 09:30-11:15, *UTC+1*	Onsite Room: Sala Giorgia Zoom ID: *831 8842 0382*

09:30-09:45	**V048**	**Automatic UAV-based Airport Pavement Inspection Using Mixed Real and Virtual Scenarios** ***Mr. Pablo Alonso***, Jon Ander Iñiguez de Gordoa, Juan Diego Ortega, Sara García, Francisco Javier Iriarte, Marcos Nieto *Fundación Vicomtech, Spain*
09:45-10:00	**V051**	**An Integral Computer Vision System for Apple Detection, Classification and Semantic Segmentation** Tajamul Ashraf, Naiyer Abbas, Mohammad Haseeb, Nadeem Yousuf, ***Dr. Janibul Bashir*** *National Institute of Technology Srinagar, India*
10:00-10:15	**V037-A**	**Time Gated Single Pixel Camera: A New Sensor for Robust Object Detection in Adverse Weather Conditions for Autonomously Driven Vehicles** ***Ms. Claudia Monika Bett***, Karsten Frenner, Max Daiber-Huppert, Wolfgang Osten *University of Stuttgart, Germany*
10:15-10:30	**V075-A**	**Two-Wavelength Digital Holographic Imaging through a Fog for Vehicle Safety** ***Dr. Igor Alekseenko***, Alexander Groeger, Giancarlo Pedrini, Felix Gloeckler, Stephan Reichelt, Daniel Claus *Institut für Lasertechnologien in der Medizin und Messtechnik, Germany*
10:30-10:45	**V040-A**	**Deep Learning based Compressed Sensing in Machine Vision: An Iterative Approach to Multi Object Detection** ***Mr. Alexander Birk***, Karsten Frenner, Wolfgang Osten *University of Stuttgart, Germany*
10:45-11:00	**V052-A**	**Uncertainty-aware Panoptic Segmentation for Autonomous Driving** ***Mr. Kshitij Sirohi***, Daniel Büscher, Wolfram Burgard *University of Freiburg, Germany*
11:00-11:15	**V098**	**In-cabin Occupant Monitoring System based on Improved Yolo, Deep Reinforcement Learning and Multi-Task CNN for Autonomous Driving** ***Chadia Khraief Ouled Azaiz*** *Capgemini/Altran Prototypes Automobile, France*
11:15-11:30		***Break***
11:30-13:30		***Lunch Break***

Special Session II

Hybrid

Machine Vision based Stress, Cognition, and Emotion Sensing in Driver/Occupant Monitoring Systems

SESSION CHAIR: Prof. Peter Corcoran, *National University of Ireland Galway, Ireland*

Nov. 19, 09:30-11:15, *UTC+1*	Onsite Room: Sala Annalisa Zoom ID: *861 9358 9476*

09:30-09:45	**V083**	**Event-based YOLO Object Detection: Proof of Concept for forward Perception System** ***Mr. Waseem Shariff***, Muhammad Ali Farooq, Joe Lemley, Peter Corcoran *University of Galway, Ireland*
09:45-10:00	**V069**	**A Feature Selection Method for Driver Stress Detection Using Heart Rate Variability and Breathing Rate** Ashkan Parsi, David O'Callaghan, ***Dr. Joseph Lemley*** *Xperi inc and University of Galway, Ireland*
10:00-10:15	**V072**	**Dataset Creation Pipeline for Camera-Based Heart Rate Estimation** ***Mr. Mohamed Moustafa***, Amr Elrasad, Joseph Lemley, Peter Corcoran *University of Galway, Ireland*
10:15-10:30	**V093**	**Neuromorphic Sensing for Yawn Detection in Driver Drowsiness** ***Mr. Paul Kielty***, Mehdi Sefidgar Dilmaghani, Cian Ryan, Joe Lemley, Peter Corcoran *University of Galway, Ireland*
10:30-10:45	**V076**	**Inducing and Obtaining Cognitive Load Ground Truth Data in Automotive Scenarios** ***Assoc. Prof. Alina Elena Sultana***, Irina Emilia Nicolae, Szabolcs Fulop, Ruxandra Aursulesei, David O'Callaghan *University Politehnica of Bucharest, Romania*
10:45-11:00	**V078**	**Development, Optimization, and Deployment of Thermal Forward Vision Systems for Advance Vehicular Applications on Edge Devices** ***Dr. Muhammad Ali Farooq***, Waseem Shariff, Faisal Khan, Peter Corcoran *University of Galway, Ireland*
11:00-11:15	**V095**	**Control and Evaluation of Event Cameras Output Sharpness via Bias** ***Mr. Mehdi Sefidgar Dilmaghani***, Waseem Shariff, Cian Ryan, Joe Lemley, Peter Corcoran *University of Galway, Ireland*
11:15-11:30		***Break***
11:30-13:30		***Lunch Break***

Technical Session 1

Hybrid

Image Detection and Segmentation

SESSION CHAIR: Prof. George A. Papakostas, *International Hellenic University, Greece*

Nov. 19, 13:30-15:15, *UTC+1*	Onsite Room: Sala Giorgia Zoom ID: *831 8842 0382*

13:30-13:45	**V062**	**Semantic Food Segmentation for Health Monitoring** ***Mr. Mazhar Hussain***, Alessandro Ortis, Riccardo Polosa, Sebastiano Battiato *University of Catania, Italy*
13:45-14:00	**V013**	**Semantic Segmentation of Crop Areas in Remote Sensing Imagery using Spectral Indices and Multiple Channels** ***Assist. Prof. Irem Ulku***, Erdem Akagunduz *Ankara University, Turkey*
14:00-14:15	**V041**	**Video-TransUNet: Temporally Blended Vision Transformer for CT VFSS Instance Segmentation** ***Mr. Chengxi Zeng***, Xinyu Yang, Majid Mirmehdi, Alberto Gambaruto, Tilo Burghardt *University of Bristol, UK*
14:15-14:30	**V050-A**	**Machine Learning based Medical Image Deepfake Detection: A Comparative Study** ***Mr. Siddharth Solaiyappan***, Yuxin Wen *Irvine Valley College, US*
14:30-14:45	**V086**	**City-scale Ground Segmentation of Aerial LiDAR by Image-analogous Gradients** ***Mr. Muhammad Azam***, Derek Jacoby, Yvonne Coady *University of Victoria, Canada*
14:45-15:00	**V092**	**Two-stage Semantic Segmentation in Neural Networks** ***Ms. Diana Teixeira E Silva***, Ricardo Cruz, Tiago Gonçalves, Diogo Carneiro *FEUP, INESCTEC, Portugal*
15:00-15:15	**V042**	**A Graph-based Approach to Video Anomaly Detection from the Perspective of Superpixels** ***Ms. Mia Siemon***, Kamal Nasrollahi, Thomas B. Moeslund *Milestone Systems A/S, Denmark*
15:15-15:45		***Afternoon Break***

Technical Session 2

Hybrid

Image Reconstruction and Computer Aided Imaging Technology

(with Special Session III-Advanced Imaging and Tomography)

SESSION CHAIR: ***Prof. Berrin Yanikoglu****, Sabanci University, Turkey*

Nov. 19, 13:30-15:15, *UTC+1*	Onsite Room: *Sala Annalisa* Zoom ID: *861 9358 9476*

13:30-13:45	**V030-A**	**Self-supervised Learning for High Quality Tiled X-ray Computed Tomography Imaging: A Simulation Study** ***Mr. Jan Matula***, Daniel M. Pelt, Tristan van Leeuwen, Tomas Zikmund, Jozef Kaiser *Laboratory of X-ray micro and nano computed tomography, Czech*
13:45-14:00	**V031**	**3D Reconstruction of Gastrointestinal Regions Using Shape-from-Focus** ***Mr. Bilal Ahmad***, Ivar Farup, Pål Anders Floor *Norwegian University of Science & Technology (NTNU), Norway*
14:00-14:15	**V055**	**Relative Attributes Classification via Transformers and Rank SVM Loss** Sara Atito Ali Ahmed, ***Prof. Berrin Yanikoglu*** *Sabanci University, Turkey*
14:15-14:30	**V063**	**Method for the Automatic Measurement of Camera-Calibration Quality in a Surround-View System** ***Mr. Martí Sánchez***, Jon Ander Iñiguez de Gordoa, Marcos Nieto, Pablo Carballeira *undación Vicomtech, Basque Research and Technology Alliance (BRTA), Spain*
14:30-14:45	**V1007**	**From Tomographic Reconstruction to Automatic Text Recognition - The Next Frontier Task for the Artificial Intelligence** Polevoy D.V., Kulagin P.A., Ingacheva A.S., Buzmakov A.V., Soldatova Zh.V., ***Dr. Chukalina M.V.***, Nikolaev D.P., Arlazarov V.V. *Institute for Information Transmission Problems (Kharkevich Institute) RAS, Russia*
14:45-15:00	**V064**	**An Active Learning Approach for Support Device Detection in Chest Radiography Images** ***Ms. Raquel Morais Belo***, Joana Rocha, Ana Maria Mendonça, Aurélio Campilho *INESCTEC and Faculty of Engineering University of Porto, Portugal*
15:00-15:15	**V1008**	**Mean Projection Image Application to the Automatic Rotation Axisalignment in Cone-Beam CT** Danil Kazimirov, ***Dr. Anastasia Ingacheva***, Alexey Buzmakov, Chukalina Marina, Nikolaev Dmitry *Institute for Information Transmission Problems (Kharkevich Institute) RAS, Russia*
15:15-15:45		***Afternoon Break***

Technical Session 3

Hybrid

Digital Image Analysis and Method

SESSION CHAIR: ***Prof. Francesco Mercaldo****, IIT-CNR, Pisa, Italy*

Nov.19, 15:45-17:30, *UTC+1*	Onsite Room: *Sala Giorgia* Online Zoom ID: *831 8842 0382*

15:45-16:00	**V065**	**On Background Bias in Deep Metric Learning** ***Mr. Konstantin Kobs***, Andreas Hotho *University of Würzburg, Germany*
16:00-16:15	**V084**	**Tiny Convolution Contextual Neural Network: A Lightweight model for Skin Lesion Detection** ***Mr. Quoc-Huy Trinh***, Trong-Hieu Nguyen Mau, Phuoc-Thao Vo Thi, Hai-Dang Nguyen *University of Science, VNU-HCM, Vietnam*
16:15-16:30	**V034**	**Floor-plan Generation from Noisy Point Clouds** ***Ms. Xin Liu***, Egor Bondarev, Peter H.N. de With *Eindhoven University of Technology, Netherlands*
16:30-16:45	**V001-A**	**Using Random Forest to Build Predictive System Coronary Artery Stents** ***Assistant Prof. Nai-Chuan Fang*** *Taichung Veterans General Hospital, Taiwan*
16:45-17:00	**V039**	**Drowsiness and Tiredness Detection System by Observing the Visible Properties of Human eyes** ***Dr. Bikash Lamsal***, Masumi Yahata, Masato Oka, Bimal Kumar Kc, Matteo Sardellitti, Naofumi Matsumoto *Kajima Corporation, Technical Research Institute, Japan*
17:00-17:15	**V047**	**Deep Learning for Blood Cells Classification and Localisation** ***Dr. Francesco Mercaldo***, Antonella Santone, Fabio Martinelli, Mario Cesarelli *IIT-CNR, Pisa, Italy*
17:15-17:30	**V056**	**Event-based High-Speed Low-Latency Fiducial Marker Tracking** ***Ms. Adam Loch***, Germain Haessig, Markus Vincze *AIT – Austrian Institute of Technology / TU Wien, Austria*
17:40-19:30		***Cocktail Banquet***

Technical Session 4

Hybrid

Image Classification and Encryption

SESSION CHAIR: ***Prof. Dorra Sellami****, Sfax University, Tunisia*

Nov.19, 15:45-17:30, *UTC+1*	Onsite Room: *Sala Annalisa* Online Zoom ID: 861 9358 9476

15:45-16:00	**V068**	**Face Attribute Classification with Evidential Deep Learning** Arın Zeyneloglu, Sara Atito Ali Ahmed, ***Prof. Berrin Yanikoglu*** *Sabanci University, Turkey*
16:00-16:15	**V011**	**An Efficient Approach for Age-Wise Rice Seeds Classification using SURF-BOF with Modified Cascaded-ANFIS algorithm** ***Mr. Namal Rathnayake***, Tuan Linh Dang, Akira Miyazaki, Yukinobu Hoshino *Kochi University of Technology, Japan*
16:15-16:30	**V043**	**Image Encryption based on Beta Discret Wavelet Transform, New Beta Wavelet Chaotic Map and Latin Square** ***Dr. Fallah AMANI*** , Zaied MOURAD *Research Team in Intelligent Machines (UR17ES46), National School of Engineers of Gabes, University of Gabes, Tunisia*
16:30-16:45	**V032**	**Detection and Correction of Image Distortion Induced by Parasitic Light Sensitivity using Deep Learning Methods** ***Mrs. Sara Esam Azmi***, Chris Bartels, Zille Hussnain, Guelen, Egor Bondarev *Eindhoven University of Technology, Netherlands / Cyclomedia Technology B.V., Netherlands*
16:45-17:00	**V085**	**Automatic Mixed Precision and Distributed Data-Parallel Training for Satellite Image Classification using CNN** ***Mr. Yohanes Nuwara***, Wong W. Kitt, Filbert H. Juwono, Gregory Ollivierre *Asia Pulp and Paper, Indonesia*
17:00-17:15	**V045**	**B-CNN: Beta deep Convolutional Neural Network over encrypted data** Hanen ISSAOUI, Asma EL ADEL, ***Prof. Mourad ZAIED*** *Research Team in Intelligent Machines laboratory, Tunisia*
17:15-17:30		***Break***
17:40-19:30		***Cocktail Banquet***

Technical Session 5

Online

Target Detection and Tracking

SESSION CHAIR: Assoc. Prof. Bogdan Kwolek, *AGH University of Science and Technology, Poland*

Nov. 20, 10:00-12:00, *UTC+1*	Zoom ID: *831 8842 0382*

10:00-10:15	**V058**	**F2SD: A Dataset for End-To-End Group Detection Algorithms** Giang Hoang, Tuan Nguyen Dinh, ***Mr. Tung Cao Hoang***, Son Le Duy, Keisuke Hihara,Yumeka Utada, Akihiko Torii, Naoki Izumi, Long Tran Quoc *Institute for AI (IAI) – University of Engineering and Technology, Vietnam National University, Vietnam*
10:15-10:30	**V017**	**Tracking Objects using QR codes and Deep Learning** ***Dr. Ali Ahmadinia***, Atika Singh, Kambiz Hamadani, Yuanyuan Jiang *California State University San Marcos, US*
10:30-10:45	**V003**	**Human Fall Detection Using Spatial Temporal Graph Convolution** ***Mr. Sai Zhang***, Chongyang Zhang *Nanjing University of Science And Technology, China*
10:45-11:00	**V028**	**A Comparative Analysis of Deep Learning Algorithms for Optical Drone Detection** ***Mr. Md Hedayetul Islam Shovon***, Rohit Gopalan, Benjamin Campbell *Defence Science and Technology Group, Australia*
11:00-11:15	**V036**	**A Coarse-To-Fine Angle Automatic Correction Method for Glassivation Passivation Parts Wafer** ***Dr. Chao Meng***, Sizhe Lang, Fei Hao, Panyu Li, Jinfei Shi *Southeast University, China*
11:15-11:30	**V002**	**Using Attention Mechanism and Improved YOLOX Vehicle Taillight Detection** ***Mr. Shujin Zhao***, Chongyang Zhang *Nanjing University of Science And Technology, China*
11:30-11:45	**V061**	**Performance Analysis of Deep Neural Networks for Covid-19 Detection from Chest Radiographs** B. H. Shekar, Shazia Mannan, Habtu Hailu, C. Krishna Mohan, ***Prof. C. Linga Reddy*** *University of Agder, Norway*
11:45-12:00	**V094**	**Real-time CNN-based Keypoint Detector with Sobel Filter and Descriptor Trained with Keypoint Candidates** ***Mr. Ke Hu***, Xun Yuan, Song Chen *University of Science and Technology of China, China*
12:00-13:30		***Lunch Break***

Technical Session 6

Online

Image Recognition and Image Model

(with Special Session IV-New Methods and Applications for Multimedia Security)

SESSION CHAIR: Prof. Andrey Kuznetsov, *Samara National Research University, Russia*

Nov. 20, 10:00-12:00, *UTC+1*	Zoom ID: *861 9358 9476*

10:00-10:15	V004	**Adaptive Spatial and Temporal Aggregation for Table Tennis Shot Recognition** ***Dr. Yenduri Sravani***, Chalavadi Vishnu, C Krishna Mohan *Indian Institute of Technology Hyderabad (IITH), India*
10:15-10:30	V079	**Fine-tuning ConvNets with Novel Leather Image Data for Species Identification** ***Ms. Anjli Varghese***, Malathy Jawahar, A Amalin Prince *Birla Institute of Technology & Science, K K Birla Goa Campus, Zuarinagar, Goa, India*
10:30-10:45	V088	**Basketball Action Recognition Algorithm Based on Global Context Awareness** ***Ms. Lijun He***, Jiangtao Luo, Guoliang Xu *Chongqing University of Posts and Telecommunications, China*
10:45-11:00	V1001	**Pyramid Histograms of Oriented Gradient for Age and Gender Recognition Using Finger Veins** Wafa Damak, Randa Boukhris, Alima Damak, ***Prof. Dorra Sellami*** *National Engineering School of Sfax, Tunisia*
11:00-11:15	V081	**Reinforcement Learning Transformer for Image Captioning Generation model--final** ***Mr. Zhaojie Yan*** *University of California, Santa Barbara, US*
11:15-11:30	V080	**How Certain are Transformers in Image Classification: Uncertainty Analysis with Monte Carlo Dropout** ***Mr. Md. Farhadul Islam***, Sarah Zabeen, Md. Azharul Islam, Fardin Bin Rahman, Anushua Ahmed, Dewan Ziaul Karim, Annajiat Alim Rasel, Meem Arafat Manab *Brac University, Bangladesh*
11:30-11:45	V071	**Ontology Based Approach Using a Systemic Knowledge Model for Surface Defect Classification** Wiem Abbes, Oussema Thebti, ***Prof. Dorra Sellami*** *National Engineering School of Sfax, Tunisia*
11:45-12:00	V100	**Copyright Protection for Image Classification Models using Pseudo-holographic Watermarks** ***Dr. Yuliya Vybornova***, Dmitry Ulyanov *Samara National Research University, Russia*
12:00-13:30		***Lunch Break***

Technical Session 7

Online

Image and Signal Analysis

SESSION CHAIR:

Nov. 20, 14:00-15:45, *UTC+1*	Zoom ID: *831 8842 0382*

14:00-14:15	**V012**	**Classification of Imbalanced Bioassay Data With Features Learned Using Stacked Autoencoder** Jeni Shah, ***Prof. Manjunath Joshi*** *Dhirubhai Ambani Institute of Information and Communication Technology, India*
14:15-14:30	**V014**	**Structural Representative Network for Remote Sensing Image Captioning** ***Mrs. Jaya Sharma***, Peketi Divya, Sravani Yenduri, Shekar B H, Krishna Mohan Chalavadi, *Indian Institute of Technology, India*
14:30-14:45	**V018**	**Crowd-sourced Optical Indoor Positioning Updated by WiFi Fingerprint Localization** ***Assoc. Prof. Li Yaoyu***, He Hua, Hou Fei *National University of Defense Technology, China*
14:45-15:00	**V049**	**Fusion of CNN and Feature Extraction Methods for Multiple Sclerosis Classification** ***Ms. Bouthaina Souid***, Samah Yahia, Tahani Bouchrika, Olfa Jemai *Research Team in Intelligent Machines, Tunisia*
15:00-15:15	**V054**	**Theoretical Evaluation of the Performance of Ambient LoRa Backscatter Communication** ***Mr. Siaka Konaté***, Changli Li, Lizhong Xu *Hohai University, China*
15:15-15:30	**V057**	**Dual Autoencoder-based Framework for Image Compression and Decompression** ***Mr. Bhargav Patel*** *Ahmedabad University - Alumni, India*
15:30-15:45	**V073**	**Confidence-Aware Calibration and Scoring Functions for Curriculum Learning** ***Ms. Shuang Ao***, Stefan Rueger, Advaith Siddharthan *The Open University, UK*
15:45-16:10		***Break***
16:10-16:25		***Closing Ceremony (online)***

Technical Session 8

Online

Computer Aided Imaging and Systems

SESSION CHAIR: Prof. Alexander Bernstein, *Skolkovo Institute of Science and Technology, Russia*

Nov. 20, 14:00-15:45, *UTC+1*	Zoom ID: *861 9358 9476*

14:00-14:15	**V038**	**Image Calibration using Ensemble of Transformer and CNN based Frameworks** ***Mr. Anuj Kumar***, Sankar Behera, Yamuna Prasad *Indian Institute of Technology Jammu, India*
14:15-14:30	**V067**	**Deep Learning for Segmentation of Optic Disc and Retinal Layers in Peripapillary Optical Coherence Tomography Images** Estefanía Rivas Vázquez, María Noelia Barreira Rodríguez, ***Mr. Emilio López-Varela***, Manuel G. Penedo *University of A Coruña, Spain*
14:30-14:45	**V070**	**Log-Base2 of Gaussian Kernel for Nuclei Segmentation from Colorectal Cancer H and E-Stained Histopathology Images** ***Dr. Santanu Roy***, Rahul Khurana, Vikas Jain, Piyush Kumar Pareek *Christ (Deemed to be University), India*
14:45-15:00	**V029**	**Efficient Loss Functions for GAN-based Style Transfer** ***Mr. Nhat-Tan Bui***, Hai-Dang Nguyen, Trung-Nam Bui-Huynh, Ngoc-Thao Nguyen, Xuan-Nam Cao *University of Science, VNU-HCM, VietNam*
15:00-15:15	**V082**	**A Lightweight Network With Multi-Scale Information Interaction Attention for Real-Time Semantic Segmentation** Xuegang Hu, ***Ms. Shuhan Xu*** *Chongqing University of Posts and Telecommunications, China*
15:15-15:30	**V087**	**An Extended Computer-Aided Diagnosis System for Multidomain EEG Classification** ***Mr. Haopeng Li***, Muhammad Zulkifal Aziz, Yiyan Hou, Xiaojun Yu *Northwestern Polytechnical University, China*
15:30-15:45	**V101**	**Autoencoders with Deformable Convolutions for Latent Representation of EEG Spectrograms in Classification Tasks** ***Prof. Alexander Bernstein***, Maxim Sharaev, Maria Zubrikhina, Dmitrii Masnyi, Rifat Hamoudi, HamidAlhaj, Bashar Issa, Almira Kustubaeva, Altyngul Kamzanova, Manzura Zholdassova, Evgeny Burnaev, Alexey Artemov *Skolkovo Institute of Science and Technology, Russia*
15:45-16:10		***Break***
16:10-16:25		***Closing Ceremony (online)***

Listeners

L001	***Prof. Yukinobu Hoshino*** *Kochi University of Technology, Japan*
L002	***Mr. Jin Dong*** *Sejong University, Seoul*
L003	***Ms. Wonhee Chung*** *Sejong University, Seoul*
L004	***Ms. Piao Xianghua*** *Sejong University, Seoul*
L005	***Ms. Yangjoo Son*** *Sejong University, Seoul*
L006	***Dr. Simone Valente*** *University of East Anglia, UK*

ABOUT ICMV

ICMV conference is initiated by School of Electronics, Si Chuan University, China, assisted by University of Stuttgart, Germany, Halmstad University, Sweden, University of Barcelona, Spain, Institute for Information Transmission Problems, Russia, The Sapienza University of Rome, Italy. This is the annual conference started in 2007(Islamabad, Pakistan), ICMV 2009 (Dubai, UAE), ICMV 2010 (Hong Kong), ICMV 2011 (Singapore), ICMV 2012 (Wuhan, China), ICMV 2013 (London, UK), ICMV 2014 (Milano, Italy), ICMV 2015 (Barcelona, Spain), ICMV 2016 (Nice, France), ICMV 2017 (Vienna, Austria), ICMV 2018 (Munich, Germany), ICMV 2019 (Amsterdam, The Netherlands), ICMV 2020-2021 (Online). ICMV 2022 warmly welcome you all in Rome, Italy during November 18-20, 2022.

The emergence of Machine Vision as a ubiquitous platform for innovations has laid the foundation for the rapid growth of the Information. Side-by-side, the use of mobile and wireless devices such as PDA, laptop, and cell phones for accessing the Internet has paved the ways for related technologies to flourish through recent developments. In addition, the Machine Vision Technology is promoting better integration of the digital world with physical environment. This conference serves to foster communication among researchers and practitioners working in a wide variety of scientific areas with a common interest in improving Machine Vision related techniques.

High quality, original papers are solicited in all areas of Machine Vision. The final program will be the result of a highly selective review process designed to include the best work of its kind in every category. The program will include invited talks as well as oral and poster presentations of refereed papers.

ICMV 2023 CALL FOR SPECIAL SESSIONS

ICMV 2023 proposals for special sessions within the technical scope of the conference. Special sessions supplement the regular program of the conference and provide a sample of the state-of-the-art research in both academia and industry in special, novel, challenging, and emerging topics.

Special-session proposals should be submitted by the prospective organizer(s) who will commit to promoting and handling the review process of their special session as Chairs or Co-Chairs of the event. Proposals should include the following information:

1. The title
2. General information of organizers (mail address of main contact person, biodata)
3. Brief description of special sessions
4. Related topics
5. Potential participants
6. Description of publicity and promotion plan

Please send your proposal to secretary@icmv.org in PDF format.

Top 10 View Points in Rome

1. The Colosseum and the Arch of Constantine

Rome. The largest structure left to us by Roman antiquity, the Colosseum still provides the model for sports arenas - present day football stadium design is clearly based on this oval Roman plan. The building was begun by Vespasian in AD 72, and after his son Titus enlarged it by adding the fourth story, it was inaugurated in the year AD 80 with a series of splendid games. The Colosseum was large enough for theatrical performances, festivals, circuses, or games, which the Imperial Court and high officials watched from the lowest level, aristocratic Roman families on the second, the populace on the third and fourth.

Beside the Colosseum stands the almost equally familiar Arch of Constantine, a triumphal arch erected by the Senate to honor the emperor as "liberator of the city and bringer of peace" after his victory in the battle of the Milvian Bridge in 312. Lines are long and move slowly, so you can save time by joining the Skip the Line: Ancient Rome and Colosseum Half-Day Walking Tour and have a knowledgeable guide, as well.

2. Vatican City

The Vatican is the smallest independent state in the world, with an area of less than half a square kilometer, most of it enclosed by the Vatican walls. Inside are the Vatican palace and gardens, St. Peter's Basilica, and St. Peter's Square, an area ruled by the Pope, supreme head of the Roman Catholic Church. This compact space offers much for tourists to see, between its museums and the great basilica itself.

Inside St. Peter's Basilica is Michelangelo's masterpiece, Pieta, along with statuary and altars by Bernini and others. The unquestioned highlight of the Vatican museums is the Sistine Chapel, whose magnificent frescoed ceiling is Michelangelo's most famous work. Inside the Vatican Palace are the Raphael Rooms, the Borgia Apartments, the Vatican Library, and a number of museums that include the Picture Gallery, Museum of Secular Art, Etruscan Museum, and others. The collections you can see in these cover everything from papal coaches to 20th-century art reflecting religious themes.

Ticket lines for the Vatican's top attractions are incredibly long, and you can spend several hours waiting in line. To save time, purchase a Skip the Line: Vatican Museums with St. Peter's, Sistine Chapel, and Small-Group Upgradetour in advance. This three-hour tour allows you to bypass the long lines and walk straight into the museums with a knowledgeable guide. Headsets are provided, and you can choose from several different departure times or upgrade to an evening or small-group tour.

3. The Pantheon

The Pantheon - the best preserved monument of Roman antiquity - is remarkably intact for its 2000 years. This is despite the fact that Pope Gregory III removed the gilded bronze roof tiles, and Pope Urban VIII ordered its bronze roof stripped and melted down to cast the canopy over the altar in St. Peter's and cannons for Castel Sant'Angelo. The Pantheon was rebuilt after damage by fire in AD 80, and the resulting brickwork shows the extraordinarily high technical mastery of Roman builders. Its 43-meter dome, the supreme achievement of Roman interior architecture, hangs suspended without visible supports - these are well hidden inside the walls - and its nine-meter central opening is the building's only light source. The harmonious effect of the interior is a result of its proportions: the height is the same as the diameter. Although the first Christian emperors forbade using this pagan temple for worship, in 609 Pope Boniface IV dedicated it to the Virgin and all the Christian martyrs, and since then, it has become the burial place of Italian kings (Victor Emmanuel II is in the second niche on the right) and other famous Italians, including the painter Raphael.

4. Roman Forum

Walking through the forum, now in the middle of a throbbing modern city, is like stepping back two millennia into the heart of ancient Rome. Although what survives of this center of Roman life and government shows only a small fraction of its original splendor, the standing and fallen columns, its triumphal arches, and remains of its walls still impress, especially when you consider that for centuries, the history of the Forum was the history of the Roman Empire and of the western world. Roman political and religious life was centered here, along with the courts, markets, and meeting places. After the seventh century, the buildings fell into ruin, and churches and fortresses were built amid the ancient remains. Its stones were quarried for other buildings and it was not until the 18th and 19th centuries that systematic excavations brought the ancient buildings to light from under a 10-meter layer of earth and rubble. Highlights not to miss are the Temple of Antoninus Pius, the Temple of Castor and Pollux, the Temple of Saturn, the Arch of Septimus Severus, the Curia, the Temple of Vesta, and the Arch of Titus.

5. Trevi Fountain

One of the city's most popular tourist attractions, this 17th-century masterpiece has been immortalized in films until it is almost a required visit. Throwing a coin (not three) into the Trevi Fountain (Fontana di Trevi) is a tradition that is supposed to assure your return to Rome. Rome's largest fountain, Fontana di Trevi is supplied by an aqueduct originally constructed by Agrippa, the great art patron of the first century BC, to bring water to his baths. The fountain was created for Pope Clement XII between 1732 and 1751 by Nicolò Salvi, and built against the rear wall of the palace of the Dukes of Poli. It depicts the sea god Oceanus (Neptune), with horses, tritons, and shells. The water swirls around the figures and the artificial rocks, and collects in a large basin, always filled with coins.

6. San Giovanni in Laterano (Basilica of St. John Lateran)

As you might expect for the episcopal church of the Pope, St. John Lateran is one of Rome's most impressive churches. After centuries of alterations, it still retains its original form from the age of Constantine, when it was built. Its façade, by contrast, is a purely baroque embellishment and a fine example of that period. Along with the mosaics in the apse, be sure to notice the beautiful 16th-century wooden ceiling. If the octagonal baptistery, San Giovanni in Fonte, looks a bit familiar, it's because it provided the model for later ones throughout Europe. Built by Constantine, it is the world's oldest Christian baptistery. Across the piazza, in the church of the Scala Santa, is the Holy Staircase, 28 steps believed to have been brought to Rome in the fourth century by St. Helen, from Pilate's palace in Jerusalem.

7. Santa Maria Maggiore

One of Rome's most majestic churches, Santa Maria Maggiore has stood here since the fourth-century Pope Liberius had a vision of the Virgin directing him to build a church where snow fell the following day. Although it was August, snow did fall on the Esquiline hill the next morning, so here the great basilica was built. Mass has been celebrated here every day since the fifth century. The three aisles of its 86-meter-long interior are separated by 40 columns of marble and four of granite, and the apse added in the 13th century is lined with mosaics of Old and New Testament themes, masterpieces of Rome's famous mosaic artists.

Rome's oldest mosaics, as old as the fourth century, decorate the upper walls, and the floor is inlaid with colored stone in the style of the expert 12th-century artisans of the Lake Como region. The first gold to reach Italy from the Americas shines on the coffered ceiling. Two popes are buried here; it's one of Rome's four papal basilicas, an important place of pilgrimage church.

8. Piazza Navona

One of Rome's most characteristic Baroque squares, Piazza Navona still has the outline of the Roman stadium built here by Emperor Domitian. It was still used for festivals and horse races during the Middle Ages, and was rebuilt in the Baroque style by Borromini, who also designed the magnificent series of palaces and the church of Sant'Agnese, on its west side. Its facade, campanile, and dome highlight the way Baroque architecture weaves convex and concave surfaces, gables, windows, columns, and piers into a unified design. In the crypt of Sant'Agnese are Alessandro Algardi's 1653 The Miracle of St. Agnes and the remains of a Roman mosaic floor. Sant'Agnese provided a model for Baroque and Rococo churches in Italy and elsewhere.

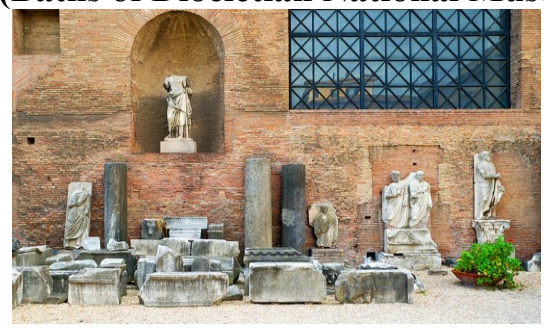
Although Borromini designed the square and its surrounding facades, it was his archrival, Bernini, who created its centerpiece, the beautiful Baroque fountain, Fontana dei Fiumi. The spirited fountain represents the four rivers then

thought to be the largest on each of the known continents, with figures personifying the Nile, Ganges, Danube, and Rio de la Plata around the large basin, each accompanied by plants and animals of their respective regions. The two other fountains in the square are the 16th-century Fontana del Moro in front of the Palazzo Pamphili, erected by Giacomo della Porta, and the 19th-century Fontana del Nettuno with its figure of Neptune. Today, the square is filled with Romans, tourists, street artists, souvenir kiosks, cafés, and during December, one of Rome's best Christmas markets. Nearby, between the Piazza and the Pantheon, the church of San Luigi dei Francesi contains three major paintings by Caravaggio from the late 16th century.

9. Palatine Hill

Strategically set 50 meters above the Tiber, the Palatine Hill shows evidence of Rome's earliest settlement: rock-cuttings found in front of the Temple of Cybele show human activity as long ago as the ninth century BC. Later, this was the site chosen by the emperors and great aristocratic families for their palaces. The Farnese Gardens were laid out on the hill in the 16th century for Cardinal Alessandro Farnese, a pleasure park of terraces, pavilions, lawns, flowerbeds, trees, and fountains designed as a kind of stage-setting for social gatherings. Highlights of the Palatine Hill are the House of Livia (Augustus' wife), the semi-subterranean Cryptoporticus, Domus Flavia, Domus Augustana, and most imposing of all, the Baths of Septimius Severus. The Palatine Hill is a lovely place to explore, combining a park with magnificent and impressive ruins of ancient Rome.

10. Terme di Diocleziano (Baths of Diocletian National Museum)



Diocletian's baths were so enormous that today, they contain two churches, large parts of a Carthusian monastery and a major museum. Michelangelo used the vast tepidarium (hot baths) as the shell for his church of Santa Maria degli Angeli, and the Museo Nazionale Romano, Rome's National Museum, fills another section with treasures of antiquity: Greek and Roman sculpture, pre-Christian and later sarcophagi, and beautiful mosaics and frescoes. The late-16th-century church of San Bernardo alle Terme was built in a rotunda at the corner of the baths; its dome is like that of the Pantheon, but only half its size.

*Part of the local information and entrance fee above comes from the network.

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