



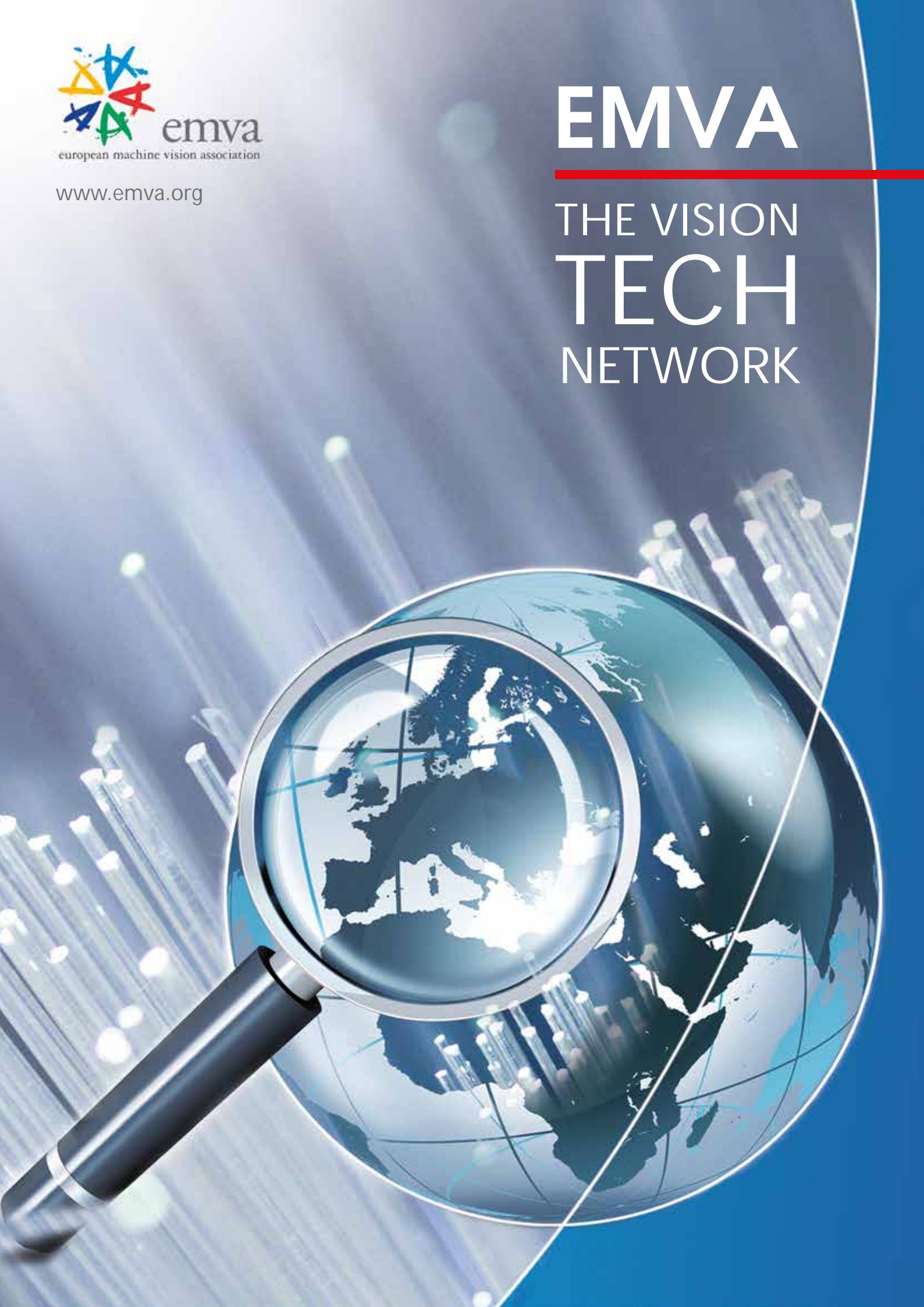


[www.emva.org](http://www.emva.org)

# EMVA

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## THE VISION TECH NETWORK



# INTRODUCING EMVA

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The European Machine Vision Association is a non-for-profit and non-commercial association representing the Machine Vision industry in Europe. The association was founded in 2003 in Barcelona by industry representatives from all over Europe as a network to promote the development and use of machine vision technology.

The EMVA is a platform for exchange, information and hands-on value for its members. The EMVA is open for all types of organizations having stakes in vision and imaging technologies: manufacturers, integrators, distributors, consultancies, research organizations and academia.



## EMVA Key Facts:

- Lean non-profit organization established 2003
- About 130 members from 25 countries
- EMVA Board: 9 members
- President: Dr. Chris Yates  
*(Director, Advanced Technology at Rockwell Automation Inc.)*
- General Secretary: Thomas Lübke-meier
- Host of global technology standards  
*(GenICam, EMVA 1288, emVision, OOCI)*

EMVA members – as the owners of the association – benefit from the networking, cooperation and the numerous and diverse activities of the EMVA.

# MISSION STATEMENT

by EMVA President Chris Yates



The market for vision technology has demonstrated explosive growth over the past decades and shows no sign of slowing. Every industrial sector and vertical market indicates a trend for greater adoption of automated vision and image processing solutions, whilst the scope of vision applications appears unlimited.

Whether ensuring the quality of pharmaceutical products, measuring the performance of each pixel in a flat panel display, identifying and classifying parts in manufacturing supply chains, to guiding the movement of robotic systems during automated assembly and inspection, or navigating autonomous vehicles undertaking complex materials handling, to ensuring our personal safety while humans work in ever closer collaboration with machines and robots, vision is the key enabling technology.

Rapid technical innovations and developments continue to expand the scope of vision applications, both addressing new sectors and providing simpler, faster, and more autonomous solutions, ultimately providing greater value to end users.

Artificial intelligence and machine learning approaches offer a new paradigm within the vision industry, driven by the availability of high-performance processing platforms and the understanding of the power of neural networks, now being used in many real-world applications.

Manufacturing and automation systems are becoming ever more connected, enterprise architectures are realizing the dream of Industry 4.0, and the volumes of data continue to grow exponentially, driving the development of new aggregation and information extraction services and products.

In alignment with these macrotrends, the European Machine Vision Association continues to represent the interests of its members, promoting the use of vision technology across all sectors and applications, whilst providing a central forum for helping understand and shape the direction of the industry.

As the vision industry moves into a new decade with many new opportunities and a changing industrial landscape, the EMVA will:

- inform, understand, and communicate the development of the vision industry to all stakeholders in Europe and beyond,
- work to ensure global standardization of vision technology to ensure a level playing field for all participants and reduce barriers to adoption, and
- seek to promote cooperation between individuals, companies, and associations at every level as the ultimate driver of growth and innovation.

The EMVA looks forward to continuing to play a central role in the future of the vision industry and working with its members, partners, and the wider community to ensure a sustainable future based on understanding, cooperation, and ultimately providing value to our societies.

# VISION TECHNOLOGY – KEY TO A BETTER LIFE



One of the simplest ways to understand a machine vision system is to consider it the “eyes” of a machine. Machine vision is the incorporation of computer vision into industrial manufacturing processes using a machine vision system - Machine Vision is anything that helps the computers see and explore the world.

Machine vision recognizes objects, can determine properties, classify objects and make decisions based on this information. Modern machine vision systems use methods and techniques of artificial intelligence (AI) such as machine learning or deep learning and artificial neural networks. Machine Vision is a key technology for the automation of processes in Industry 4.0.

In addition to typical industrial applications, machine vision systems can be found in non-industrial areas such as medical, traffic control, biometrics, multimedia and many more. Without the technical revolution of machine vision, many achievements that make life easier and healthier would not have been possible.

The Machine Vision market is one of the fastest growing market segments. According to Verified Market Research, the Global Computer Vision Market was valued at USD 11.88 Billion in 2018 and is projected to reach USD 21.24 Billion by 2026, growing at a CAGR of 7.49% from 2019 to 2026.

The convergence of core technologies and the rapidly growing fields of vision-based applications in a variety of industries will continue to drive growth.

# EMVA – SHAPING VISION TECH

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The EMVA as a member-supported trade association promotes the growth of the global vision and imaging industry. The development of standards is the key to success and therefore highly relevant for any industry - particularly for the relatively complex and globally distributed machine vision industry. Various global machine vision standards make vision technology less expensive and easier to use.

Digital technology has revolutionized the ability to capture, analyze and use, both visible and non-visible light energy, at high speed. This has enabled to constantly expand the applications of vision technology to automate manufacturing, to streamline and optimize processes, and to drive ever expanding research into our physical environment.

The EMVA plays an active role in the development of Machine Vision standards. Currently, the EMVA is hosting several standards that are widely accepted by the Machine Vision industry.

## Vision Technology Standards hosted by the EMVA

### GenICam

GenICam (*Generic Interface for Cameras*) provides a generic programming interface for all kinds of cameras and devices, no matter what interface technology is being used (*GigE Vision, USB3 Vision, CoaXPress, Camera Link HS, Camera Link, 1394 DCAM, etc .*). By using the GenICam API, a user has the freedom to select the camera and interface technology that fits best with their requirements without the need of changes in their application software. GenICam has become increasingly popular and support of GenICam is therefore mandatory in new interface standards like USB3 Vision and CoaXPress.



### EMVA 1288

EMVA 1288 is the standard for measurement and presentation of performance specifications for Machine Vision sensors and cameras. The EMVA launched the initiative to define a unified method to measure, compute and present specification parameters for cameras and image sensors used for machine vision applications. The EMVA 1288 standard creates transparency by defining reliable and exact measurement procedures as well as data presentation guidelines and makes the comparison of cameras and image sensors much easier. The Standard is developed and extended by a consortium of industry leading sensor and camera manufacturers, distributors and component suppliers.





*Vision Standards Meeting 2019*

## **New EMVA standardization initiatives**

### **emVision – Standard for Embedded Vision**

Cameras and PCs are the main components of machine vision systems and have been tremendously miniaturized over the last years. The combination of a processing board with a powerful small camera, enables the design of very compact vision modules which can be integrated into larger systems. Such systems are called embedded vision systems and provide high value to end-users through the combination of small form factor and large processing power. Hosted by the EMVA, in August 2018 the Embedded Vision standard initiative was formed to address the needs of this technology topic. With impressive support from the machine vision industry, the standardization group is developing a standard to achieve simple integration and exchange of different embedded cameras within embedded vision applications. Already more than 40 companies are showing interest in this initiative and the working group of the standard.

### **OOCI – Open Optics Camera Interface**

OOCI is the Open Optics Camera Interface Standard launched by the EMVA in 2019. The EMVA decided to start a new standardization group on an open lens camera communication standard, which may have different mechanical connections, but a

common protocol closely linked to the GenICam Standard. The goal of the OOCI working group is to standardize the camera interface for optical components inside of, or attached to, machine vision cameras. The optical components covered by this standards effort will include, but not be limited to: Lenses, Filters, Filter Wheels, Shutters, Apertures, etc. Already, major camera and optics manufacturers have joined the working group.

## **EMVA – Host of the International Vision Standards Meeting (IVSM) Fall 2019**

Machine Vision engineers from all over the world met from 07-11 October in Stresa/Italy on the shores of Lago Maggiore for the International Vision Standards Meeting (IVSM) Fall 2019. This meeting takes place twice a year at different locations in Asia, Europe and North America under the global G3 initiative, which is supported by the machine vision associations AIA, CMVU, EMVA, JIIA and VDMA. Hosting meeting in Stresa was the EMVA together with the corporate sponsor Lakesight Technologies.

# COMMITTED TO THE GROWTH OF OUR MEMBERS

The EMVA is a member-owned association. The members guide the development, goals and activities of the association through their elected Board of Directors, comprised of industry representatives working voluntarily and free-of-charge for an election period of three years.

The EMVA's members include all market participants in machine vision at various stages of the value chain. These include manufacturers of hardware components in the field of sensor technology, accessories such as optics and lighting, manufacturers of camera systems, system integrators, software developers, as well as the customers of the members, such as automation companies. The active members of the EMVA also include research institutes, universities, consultancies, media and associations.

## EMVA Media Platforms boost business opportunities

As one of the world's largest machine vision associations, the EMVA offers its members a variety of attractive formats that companies can leverage to reach top decision-makers in the industry directly. The monthly EMVA e-newsletter focuses on member news, case studies, product presentations, job offers and industry events and is sent out to subscribers from 27 countries. More than 50,000 unique visitors each year from all over the world visit the EMVA website and find out about the latest technical and business progress in machine vision. With an average of over 170,000 page views, top machine vision decision makers prefer the EMVA website as their primary source of technical information about EMVA standards, as well as using the Buyers Guide to search for companies, products and services, and gain insight into EMVA's key industry events.





# THE WHO IS WHO OF THE VISION INDUSTRY

Today, the EMVA represents the interests of about 130 active members from more than 25 countries. The EMVA does not only have European-based companies among its members. More than 15% of the member companies, with a growing tendency, have their headquarters in North America and Asia.

All members, whether small and medium-sized organizations or large companies, play an important role in the value chain in their respective industries. Science and research institutes and universities also consider EMVA an important platform for their activities: Consultancies, research organizations and academia contribute as active members to the continuous development of machine vision technology.

## Current EMVA Membership

Active Silicon	IDS	Rauscher GmbH
Adimec	ifm electronic	Rockwell Automation
ADLINK Technology	IHFood	Schneider Kreuznach
Advanced Technologies	iiM AG	Sensor to Image
Advantech Europe	Image S	SICK AG
AEON Verlag & Studio	Imperx	Silicon Software
AIT	Innomiles International	sinfraRed
Allied Vision Technologies	Inspekto AMV	Smart Vision Lights
AMS	inos Automationssoftware	Sony Europe
ATD Electronique	ISRA VISION	Stemmer Imaging
Baumer Optronic	JAI A/S	Sualab
Birger Engineering	Kappa optronics	SVS-VISTEK
Carl Zeiss Aut. Inspection	Kolektor Orodjarna	SYMOP
Carl Zeiss AG	LMI Technologies Inc.	Tamron
CCS Europe	Lucid Vision Labs	Tattile
China Daheng Group	Matrox Imaging	Tecnalía Foundation
Chromasens	MaxxVision GmbH	Teledyne DALSA
Cognex Germany	Mega Phase	Teledyne e2v
Components Express	Merz freeform technologies	Teledyne Lumenera
CRETEC	Midwest Optical Systems	TIAMA Group
Datalogic Automation	Mikrotron	Toshiba teli
DATAPIXEL	Mitsubishi Electric	TST Engineering & Vision
DIMI	Nacacue Corporation	VDMA Robotik + Automation
Dr.-Ing. Jänchen * Business Development	NET	Vicomtech-IK4
Edmund Optics GmbH	NotaVis	Video Systems
Effilux	ON Semiconductor	Vieworks Co. Ltd
Euresys S.A.	OPT Machine Vision	Vision Club of Finland
Flir Systems	Opto GmbH	Vision Components
FRAMOS GmbH	OptoMotive Mehatronika	Vision Markets
Fraunhofer	Optronis GmbH	Vision Ventures
Fujifilm Europe	PCO AG	ViTec Avtomatika
Gardasoft Vision	Phaer	V-Optics
Hangzhou Hikvision	Phase One Industrial	Voyage81
HCI Heidelberg University	Pleora Technologies	XIMEA
HD Vision Systems	Precitec Vision	xVision Automation
Hirakawa Hewtech	Prophesee	ZheJiang Huaray
Hochschule Darmstadt	ProPhotonix	Z-Laser
HTW Chur	Qioptiq Photonics	
Ideko S.		

# VISION KNOWLEDGE TRANSFER

Knowledge transfer and education is one of the key factors for success in any technology based industry. In our globalized world this is more important than ever before. Like other high-tech industries, the vision industry has a high demand for well-educated and well-trained professionals. For many companies this has become a decisive factor for growth. The EMVA has recognized the need for know-how transfer and specific training in the field of machine vision. As part of its association activities, the EMVA offers attractive platforms for presenting new technologies and applications, initiates specialist conferences on new technological trend topics and offers a wide range of technical training courses.

## EMVA Technical Trainings and Certifications

### EMVA 1288 Know-howTransfer

EMVA 1288 is the standard for measurement and presentation of specifications for Machine Vision

sensors and cameras. Unifying the most important manufacturers, distributors and end users of machine vision cameras the EMVA 1288 working group has elaborated a modular approach to define step by step the measurement and communication of an ever increasing set of performance metrics for image sensing technologies.:

The required level of knowledge is covered by a series of several webinars that have been recorded and are available on the EMVA Training Seminar

Channel. The EMVA also offers EMVA 1288 Certification at user and expert level. The required level of knowledge is taught in two-day courses, offered by several EMVA member companies and provides an industry recognized qualification for those who complete the course.

## EMVA Vision Knowledge Transfer Network

### Machine Vision Fundamentals

With the “Machine Vision Fundamentals” the EMVA presents a series of articles intended to serve developers and user alike by providing an introduction to various aspects of Machine Vision. The articles are both an entry point for technology and industry newcomers as well as a refresher on selected topics for experienced practitioners.

### Guide to Understanding Machine Vision Standards

This comprehensive look at the various global machine vision standards was developed on the initiative of the leading vision associations AIA, CMVU, EMVA, JIIA and VDMA. The brochure covers the various interface, performance, lens mount, lighting and system integrator standards. It is an invaluable one stop reference to all the currently recognized and promoted global vision standards.

### Case Studies contributed by EMVA Members

The EMVA offers a broad platform for the exchange of the know-how that EMVA member companies have gathered in solving complex and demanding machine vision applications. The EMVA e-mail newsletter publishes interesting case studies every month, which are collected and made available to a wide audience.



## EMVA Vision Knowledge Transfer at Conferences and Shows

### Annual European Machine Vision Forum – Where research meets industry

The EMVA's annual two-day event, where machine vision industry and academic research meet to learn from each other, gain an understanding of the newest research results, discuss open problems from applications, learn about new and emerging application fields, and enable new research cooperations between industry and academics.



### Embedded VISION Europe Conference

Embedded VISION Europe, started in 2017, is the leading conference in Europe focusing exclusively on the areas of this disruptive technology and organized by the EMVA, supported by Messe Stuttgart, the organizer and host of the biennial VISION international trade fair. Embedded VISION Europe is aimed at developers and users of embedded vision technologies from all industries. The conference is accompanied by an exhibition of tech-



embedded vision competence with innovative products, applications and services.

### Control Vision Talks

The Control international trade fair for quality assurance, an annual trade show held at the Stuttgart Exhibition Centre, provides suppliers and users with a globally recognized technical event which is focused strictly on relevant issues. At Control the EMVA in partnership with trade show organizer P.E. Schall and supported by media partner inVISION, organize the EMVA Forum 'Control Vision Talks'. The presentations of this forum aim to educate the trade show visitor on benefits, applications and methods of machine vision and optical metrology solutions for factory automation.



# PARTNERSHIPS AND INITIATIVES

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The EMVA maintains several partnerships with globally organized associations and initiatives in order to promote vision technology and to open a wider spectrum of activities for market participants.

## G3 – Worldwide Cooperation on standards

Because developing standards is very time-consuming and many competing standards is counter productive, the EMVA sought cooperation on the field of standards development with other Machine Vision associations. As a result of this EMVA (Europe), AIA (North America) and JIIA (Japan) entered into a cooperation agreement on standards called the “G3” in 2009. Two more associations joined “G3”: VDMA (Germany) in 2014 and CMVU (China) in 2015. Through this cooperation in G3, EMVA members have access to the working groups of standards that are hosted by the other G3 associations and standards are developed which benefit from global visibility and implementation.

## euRobotics

The EMVA cooperates with the euRobotics AISBL association and is an active contributor at the



European Robotics Forum 2020. The EMVA organizes and hosts the workshop “Vision Tech – Innovation Driver for Robotics and AI” to promote and explain how

vision technology can help solve robotic and automation problems, as well as ultimately help align European-wide strategic roadmaps in vision and robotics.

## Photonics21

Photonics21 aims to establish Europe as a leader in the development and deployment of photonics technologies within the various applications fields such as ICT, lighting, industrial manufacturing, life science, safety as well as in education and training. The EMVA is



pleased that Dr.-Ing. Dirk Berndt has been elected to the Board of Stakeholders (BoS) of Photonics21 in his function as member of the EMVA board of directors. The Board of Stakeholders is the main decision-making body of the European Technology Platform (ETP) Photonics21.

## EMVA NETWORKING PLATFORMS

The EMVA runs a series of events to actively promote networking for members of the association, market participants in the vision industry and companies from related fields. The annual highlight of the Vision industry is the EMVA Business Conference, which brings together the who's who of the industry in a different major city each year.

### The EMVA Business Conference

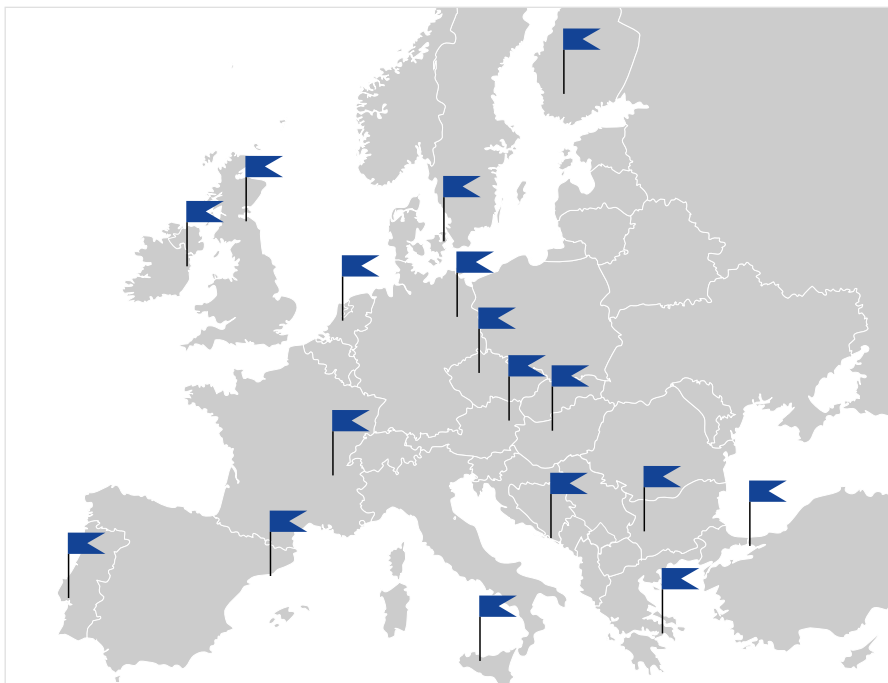
The EMVA Business Conference unites business leaders and technical experts within the Machine Vision industry from Europe and around the world to present and discuss the trends and challenges of our business. It provides a unique platform in Europe for networking, establishing contacts and exchanging ideas. The EMVA Business Conference sets the course for developing and strengthening the industry in Europe and beyond. The annual EMVA Business Conference brings together CEOs, managing directors, corporate strategists, marketing directors, technical managers and other executives of the vision tech industry meet



to exchange market intelligence and news on innovative technologies. The EMVA Business Conference year by year visits a different European city. In 2020 Sofia, capital of Bulgaria, will welcome the machine vision community.

### Networking

Being the most important networking event for the Machine Vision industry in Europe, the EMVA Business Conference offers plenty of networking and personal meeting opportunities. Individual face-to-face meetings can be pre-scheduled using a comfortable registration platform.



*Previous Conference Locations*

## EMVA 'S NETWORKING GENERATES BUSINESS OPPORTUNITIES

The EMVA continuously looks for new opportunities to promote Vision Tech and to grow the portfolio of benefits for EMVA members.



### VISION, Stuttgart

VISION is the world's leading trade fair for machine vision. The who's who in the machine vision industry meets in Stuttgart and present an incomparable range of

products and services: from sensors to processors, from cables to cameras, from software to illumination systems. The EMVA exhibits at VISION 2020 as leading organizer at the International Machine Vision Standards Booth. Machine Vision experts present the most commonly used digital interface standards in the industry in their current versions and stand by for advice on which standard should be used best for a certain application. For many years the EMVA has hosted the popular 'International VISION Night' event on the evening prior to the fair opening, where the machine vision industry traditionally meets for an informal and relaxing evening with extensive networking opportunities.



### Measurement World, Paris

Our partnership with the organizers of ENOVA Paris results in the special offer to EMVA members of a reduction on fees for those exhibiting at Measurement World. The biannual exhibition format is dedicated to measurement in its broadest sense. The EMVA contributes to the machine vision presence during the exhibition with a presentation forum, covering topics which include state of the art vision technology, the description of concrete machine vision applications in different industrial sectors, machine vision standards and their objectives, as well as the description of the vision markets in France, in Europe and worldwide.

### SPS Italy – The Parma Vision Night

SPS Smart Production Solutions Italy in Parma is the yearly trade show bringing automation sup-



pliers and manufactures together and covering the whole range of products, from electrical components to complete integrated automation systems. First time introduced in 2016 the 'Parma Vision Night' is organized by SPS Italy and the European Machine Vision Association. Representatives of local Italian vision players and globally acting corporations meet annually for the „Parma Vision Night“ and benefit from the networking opportunities.

### Image Sensors Europe, London / IS Auto Europe, Stuttgart

The EMVA is partnering with Image Sensors Europe in London, Great Britain. The conference is attended by over 200 representatives of vision systems. The IS Auto Europe: Perception Systems in Stuttgart, Germany, provides a forum for OEM's, Tier 1, image sensor suppliers and providers. Speakers offering insights on adapting to future imaging demands as well as gaining a full understanding of the key industry challenges and opportunities driving technologies in this ever-evolving market. The EMVA provides its members outstanding discounts on conference tickets.





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