

## **Image Sensor and Camera Technology 10-11-12 February 2016 in San Francisco**

Aphesa organizes an image sensor and camera technology training tour between October 2015 and November 2016. The training sessions are organized as three days per location and split over several courses, it is possible to subscribe for a single course, multiple courses or the full session.

The courses are introductory to mid-level, with some advanced topics, and are designed for engineers who are new to the field of imaging or non-engineering personnel who needs a more in-depth understanding of the technology or engineers familiar with some elements of machine vision but not the whole picture. It is also a good refresher course for experienced engineers and a good introductory course for sales, marketing and support personnel. Each course is accompanied by a question and answer session and an open discussion session. Some courses include exercises. There are PDF notes for each course available for download or on a pen drive.

The courses in San Francisco are organized at a downtown venue between Wednesday February 10<sup>th</sup> and Friday 11<sup>th</sup>, the week before the Photonics West show and Electronic Imaging symposium and the week after the image sensor conference.

The course sessions or a customized course session can be organized in company for a special price and an unlimited number of attendees.

### **Venue**

The training is organized at Intelligent Office, located 101 Pine Street, Suite 1100 in downtown San Francisco, almost at the intersection with Market street (First Republic bank building).

The closest BART station is Embarcadero and the closest bus and light rail station is Market & Battery. There are several parking garages and restaurants inside this building and on Market Street and a vast choice of hotels in downtown San Francisco.



## Course schedule

- Monday, December 7<sup>th</sup> :
  - 9:00 AM to 9:30 AM : registration
  - 9:30 AM to 9:40 AM : Aphesa presentation – code : APHE
  - 9:40 AM to 12:30PM and 1:30PM to 2:15PM : Introduction to imaging (light, light spectrum, light sources, scene, behavior of light, basic radiometry and photometry, lighting techniques, polarization, filters, optical basics, MTF, camera basics, color issues, multispectral and hyperspectral imaging, camera interfaces, photography and imaging terms, lens standards, camera interface standards) – course code : IMAG, including a short break
  - 2:15PM to 6:00PM Introduction to CMOS image sensors (photodiodes, pixels, arrays, readout circuits, ADC circuits, architectures, spatial and temporal noise sources and noise compensation, color filters, microlenses, dark current, defect pixels, ageing, temperature effects, image sensor design flow, image sensor production process, image sensor packaged, back-side illumination, wafer scale packaging), including a short break – course code : CMOS
- Tuesday, December 8<sup>th</sup> :
  - 9:15AM to 10:15AM : Quick summary of some elements of APHE, IMAG and CMOS courses for attendees of day 2 sessions only – course code : SUMM
  - 10:15AM to 10:30AM : break
  - 10:30AM to 12:30PM : Introduction to software based (multiple exposure) high dynamic range imaging, including algorithms and artifacts and introduction to specific CMOS image sensors for HDR imaging, including control methods, pixel designs and artifacts – course code : HDRI
  - 1:30PM to 2:30PM : Introduction to 3D imaging – course code : 3DIM
  - 2:30PM to 4:00PM : Introduction to the EMVA1288 standard – course code : EMVA
  - 4:00PM to 4:15PM : break
  - 4:15PM to 4:45PM : Introduction to high speed and real time imaging – course code : HSRT
  - 4:45PM to 5:15PM : Special considerations related to mobile imaging – course code : MOBI
- Wednesday, December 9<sup>th</sup> :
  - 9:15AM to 12:30PM : Introduction to image processing, including a short coffee break – course code : PROC
  - 12:30PM to 12:45AM : high temperature imaging – course code : TEMP
  - Additional topics or private consulting sessions per specific request and appointment in the afternoon at the Holiday Inn Fisherman's Wharf hotel.



## Prices

Course code	Price, before January 10th	Price, after January 10th
APHE	Free	Free
IMAG	275 euro	295 euro
CMOS	275 euro	Not available
SUMM	70 euro (free for attendees of day 1)	80 euro (free for attendees of day 1)
HDRI	170 euro	Not available
3DIM	75 euro	85 euro
EMVA	100 euro	Not available
HSRT	45 euro	55 euro
MOBI	45 euro	55 euro
PROC	240 euro	280 euro
TEMP	15 euro	20 euro

Special price for the full session : 995 euro (ordered and paid by January 1<sup>st</sup>), 1040 euro (ordered before Jan 10<sup>th</sup>) or 1150 euro (ordered after Jan 10<sup>th</sup>).

Reductions are offered for attendance to multiple courses (-10% on the total price for more than two course) or multiple members of a company attending the same courses (-10% for the second member, -30% for any additional member), or previous attendees (-10%).

Cancellation policy : 50 euro (or 50% of course price if less than 50 euro) if more than four weeks before the courses, 50% if less than four weeks before the courses, 100% after February 1<sup>st</sup>.

Payment terms : 30 days net, invoiced at the time of booking, net 10 after February 1<sup>st</sup>.

The full course session of three days will not run or will be reorganized over only one or two days if more than two sessions do not have the required minimum number of attendees. The minimum number of attendees in San Francisco is 5 and the maximum is limited to 11.

## Registration

Contact [info@aphesa.com](mailto:info@aphesa.com) or one of our authorized distributors if you intend to attend one or more training sessions, mentioning the course code and the number of attendees from the same company. Aphesa will then provide a quotation for the desired training package. The final decision to organize or cancel courses will be made two weeks before the scheduled training date. Contacting us for a quotation or for more information does not engage yourself to buy a course.

## About Aphesa

Founded in 2008, Aphesa provides consulting and development services in the field of imaging. Our company has designed multiple customer specific cameras for use in industrial, medical and oil&gas applications and has provided consulting services for the design of many other image sensors, cameras and systems. Our experience includes GigE-Vision, USB, CameraLink cameras and line scan or area scan sensors in color or monochrome. Our experience also includes high temperature designs, multispectral imaging, high dynamic range imaging, high-speed imaging, embedded image processing and many other topics. Aphesa is also specialized in image sensor and camera testing and has developed EMVA1288 compliant test equipments as well as other specific test equipments for laboratory or production use; the EMVA1288 measurements are also offered as a service.

More information about Aphesa : <http://www.aphesa.com>  
Contact us : [info@aphesa.com](mailto:info@aphesa.com)

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Visit our website for distributor's contact information.

## Future training sessions

Aphesa plans other training sessions in Asia, North America, Belgium and Germany in the next 12 months. Contact us for more information.

