Image Sensor and Camera Technology
14-15-16 November 2016 in Stuttgart

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 from introductory to advanced depending on the 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 high resolution PDF course notes for each course available on a pen drive.

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

This is the last training out of this schedule. Future similar training sessions are not guaranteed, except private training in company.

All attendees will receive a free access pass to the Vision Show.

Venue

The training is organized at the ROCK business center near Stuttgart airport and Stuttgart Messe. It is organized the week after the Vision show. The business center is located close to the airport, the convention center, the Strassebahn station and the Holiday Inn Express hotel. Soft drinks and coffee breaks are included. Special room rates available on request at the Holiday Inn Express hotel.

Course schedule

- Day 1:
  - 8:30 AM to 9:00 AM : welcome coffee and registration
  - 9:00 AM to 9:20 AM : course introduction and Aphesa presentation – code : APHE
  - 9:20 AM to 12:10PM and 1:10PM to 2:00PM : Introduction to imaging (light, light spectrum, light sources, scene, behavior of light, basic radiometry and photometry, lighting techniques, polarization, filters, optical basics, MTF, CCD and CMOS image sensors, 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, course level introductory to mid-level
  - 2:00PM to 5:30PM : Introduction to CMOS image sensors (photodiodes, pinning, SPAD, pixels, 3T, 4T and 5T pixel operation, rolling vs global shutter, arrays, image sensor design, readout circuits, ADC circuits, architectures, spatial and temporal noise sources and noise compensation, color filters, microlenses, dark current, defect pixels, ageing, temperature effects, high temperature imaging), including a short break – course code : CMOS, course level mid-level to advanced
  - 5:30PM to 5:45PM : open discussion, additional questions
- Day 2:
  - 8:45AM to 9:00AM : open discussion
  - 9:00AM to 9:45AM : Production of CMOS image sensors (design flow, image sensor production process, image sensor packaging, back-side illumination, wafer scale packaging, butting, stitching) – course code : PROD, course level introductory to mid-level
  - 9:45AM to 10:15AM : Introduction to high speed and real time imaging – course code : HSRT, course level introductory to mid-level
  - 10:15AM to 10:30AM : break
  - 10:30AM to 12:30PM : Introduction to software based (mutliple 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, mid-level to advanced
  - 1:30PM to 2:30PM : Introduction to 3D imaging – course code : 3DIM, course level introductory to mid-level
  - 2:30PM to 4:00PM : Introduction to the EMVA1288 standard – course code : EMVA, course level introductory to mid-level
  - 4:00PM to 4:15PM : break
  - 4:15PM to 4:45PM : Introduction to infrared imaging – course code : IRIM, course level introductory
  - 4:45PM to 5:15PM : Special considerations related to mobile imaging – course code : MOBI, course level introductory
  - 5:15PM to 5:45PM : open discussion, additional questions

- Day 3:
  - 8:45AM to 9:00AM : open discussion
  - 9:00AM to 12:15PM : Introduction to image processing, including a short coffee break – course code : PROC, course level mid-level
  - 1:15PM to 2:45PM : practical training on lenses, photography, studio photography and HDR photography (and other topics depending on availability of equipment)
  - 2:45PM to 3:00PM : break
  - 3:00PM to 5:30PM : Additional topics or private consulting sessions per specific request and appointment in the afternoon OR test to assess your knowledge level.

The attendees will receive a certificate of attendence and a certificate of test results.

Prices

Course code	Price, before October 15th	Price, after October 15st
APHE	Free	Free
IMAG	295 euro	350 euro
CMOS	295 euro	350 euro
PROD	50 euro	60 euro
HSRT	50 euro	60 euro
HDRI	160 euro	190 euro
3DIM	70 euro	80 euro
EMVA	90 euro	110 euro
IRIM	40 euro	50 euro
MOBI	40 euro	50 euro
PROC	180 euro	215 euro

Special price for the full session : 900 euro (ordered before September 1st), 995 euro (ordered before October 15th) or 1200 euro (ordered after October 15th).

Reductions are offered for attendence 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 November 1st.

Payment terms : 30 days net, invoiced at the time of booking, net 10 after October 1st.

The full course session of three days will not run or will be reorganized over only one or two days if more than one third of the time does not have the required minimum number of attendees. The minimum number of attendees is 5 and the maximum is limited to 13.

Registration

Contact 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, image sensor evaluation boards and systems. Our experience includes GigE-Vision, USB, USB3Vision, 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
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