CHIPS.

Newsletter
Oktober 2017

Self-driving cars are the natural extension of active safety and obviously something we should do.

Elon Musk

CEO's Note

Dear CHIPS readers,

this issue is about the use of our time-of-flight technology in future cars. Currently the automotive industry is working with great effort on making autonomous driving possible. ADAS – Advanced Driver Assistance Systems – are needed for that.

ESPROS is part of this effort and our outstanding NIR sensitivity, our ambient light tolerance and our high performance CCD and ADC technology help to solve important problems.

An entirely new generation of pulsed TOF (pTOF) sensors – also called LiDAR imaging – is under development to be employed in long range sensors. While state of the art sensors generate a limited amount of vertical lines (3, 8, 16, 32 typically), our first sensor will already have 144 pixel vertical resolution and therefore generate for the first time a full distance image.

I presented this new technology at the AutoSens conference in Brussels a few weeks ago and was very excited about the positive reaction of the automotive industry players.

While pTOF gives the car the required visibility range out to 300m, the established cwTOF technology helps monitoring the car cabin and the near-field up to 20m around the car.

Coincidently, in 2017 for the first time the largest share of the ESPROS revenue comes from the automotive industry.

Beat De Coi

Pulsed TOF – the new generation technology

Main challenges for the next generation of ADAS sensors include:

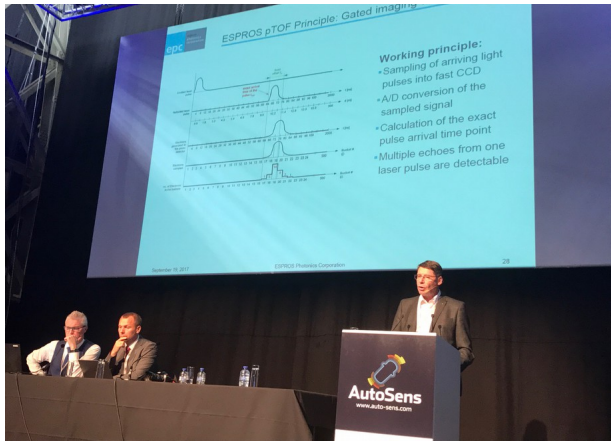
- Detecting objects beyond 100m range.
- Having a detailed image of the scenery instead of a few vertical lines of data points.
- Reaching mass market pricing range.

ESPROS is currently making huge steps to make this possible.

We are developing new generation pulsed TOF sensor chips, which will directly detect the time of flight of a nano-second light pulse from the illumination source to the object and back into the sensor. This is only possible because of our unique CCD on CMOS process technology.

Performance parameters of the new pTOF sensors include a quantum efficiency of 70% at 905nm, a sensitivity level as low as 20 electrons for object detection (the sensor will detect the presence of a 10% reflectivity object almost 100m away), 250MHz CCD sampling and interpolation algorithms to reach centimeter accuracy. Due to the extremely short sampling times, the sensors will be operating in full sunlight without disturbance and function under all weather conditions.

For the first time, ESPROS presented these performance criteria to the public at AutoSens Brussels Sept 20-21. The announcement was met with great interest and many new contacts to key players in the automotive industry were made.



Beat De Coi, CEO ESPROS explaining the function principle of the new pTOF generation imager at AutoSens, Brussels

We very much look forward to the first quarter of 2018, when a demonstrator of our pTOF technology is set up in Sargans. If you are looking for ADAS sensor technology, please get in touch with us for more details on ESPROS pTOF.

Car cabin monitoring with epc660

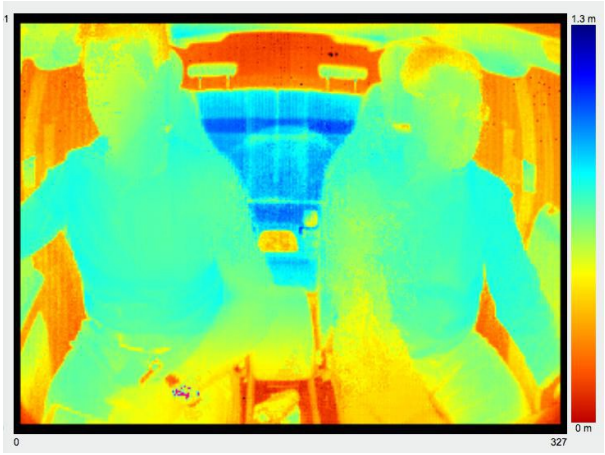
Passenger monitoring is considered a highly beneficial function for autonomously driving vehicles. When you are no longer driving the car yourself, you will likely take an entirely different seating position and engage yourself in some other activity (reading, talking to somebody, turning in some direction etc).

Accordingly your airbag and your safety belt should adapt their response in case of an emergency with respect to your changed seating position to give you best possible protection. If such adaption is not provided, you might even be injured by the safety functions.

Determining your current body position (and several other useful functions) can be easily implemented with 3D cameras. In general, car cabin monitoring requires quite large field of views, a wide range of different reflectivity objects is present and strong sunlight might generate lots of background signal. All-in-all, this is an application where the epc660 can play out all its unique strengths.

Various studies are being currently conducted with dozens of criteria and situation details using our epc660 Evaluation kit (i.e. the DME660 camera).

Get in touch with ESPROS sales team for support on your own application work.



Cabin monitoring with epc660.

Product of the month: DME660

The DME660 made a huge jump in performance with epc660-007 and the new calibration procedure (please see our application note AN10). Every DME660 camera now ships fully calibrated!

The DME660 was and still is the starting point for many camera development projects (see the example above). Please intensively use it to study the TOF imaging conditions of your application. A real 3D image is much more valuable then just a calculation. The epc660 Evalkit is fully documented and gets you up to speed. It allows to evaluate almost all chip features, e.g. binning, HDR, modulation frequency selection, integration time, motion blur reduction, ambient light suppression, among others.

The new GUI software now provides much higher color granularity for distance coding, 1mm instead of the previous 1cm distance resolution, improved point cloud representation, improved pixel monitoring, time series display at an arbitrary pixel position and Kalman filtering. Please check it out! Current evaluation kit users get the upgrade for free!

ESPROS DME660 camera with latest epc660-007, M12 objective lens, Beagle bone black processor board, design documentation and new GUI software.

ESPROS on the road

LINX Days, Japan: ESPROS Photonics will participate in the seminar series of distributor LINX Inc. in Osaka, Nagoya and Tokyo on October 17 – 19, 2017.

Embedded Vision Europe, Germany: ESPROS Photonics will present at the Embedded Vision Europe conference in Stuttgart on October 12, 2017.

Photonics West, USA: ESPROS Photonics will show its new products at the Photonics West 27 January - 1 February 2018. Don't miss it!