High-speed inspection with "xposure LeMans"

World-leading technology leads the way to new embedded high-speed vision applications

Current trends in automation technology require ever smaller, faster and cheaper components and systems that can capture an increasing number of surface properties. With its outstanding acquisition and processing speed xposure LeMans enables **new high-speed applications** in the field of embedded vision, providing both higher optical resolution and higher inspection speed. Experts at the AIT Austrian Institute of Technology are developing world-leading vision technologies for global players. The research focus is on ultrafast line scan sensors and cameras, scalable embedded vision systems, computational imaging and deep learning.

xposure – the worldwide fastest line-scan sensor

With its readout rate of 600,000 lines per second, the xposure sensor represents a milestone towards **high-speed and high-quality imaging**. The sensor architecture consists of a total of 60 lines and enables line readout frequencies of 600 kHz for single lines, 200 kHz for RGB and a framerate of 10 kHz for all 60 lines. The sensor can thus provide images with a resolution of 0.018 mm at a transport speed of 36 km/h, which allows even the smallest surface hairline cracks to be detected. The sensor is also ideal for inspection tasks in the high speed domain – an image resolution of 0.15 mm can be achieved at speeds of 324 km/h. This means that any defects in infrastructure can be identified at an early stage, e.g. indications of impending rail fracture. The sensor was developed in cooperation with the Fraunhofer Institute for Microelectronic Circuits and Systems.

xposure camera – the worldwide fastest high-speed multi-line scan camera

The high data rate provided by the xposure sensor requires high-performance interfaces for image readout. The xposure camera therefore features a 40 GigE Vision interface, whereas conventional high-speed cameras use 10 GigE Vision or 25 Gbit/s CoaxPress. The networking enabled xposure camera combines a multi-line scan sensor and high data rates, opening up unexpected possibilities such as **single-sensor inline 3D surface analysis**. xposure LeMans can be used to expand the application range of embedded vision by adding computational imaging methods. For example, the multi-line scan sensor can also measure material properties using **multi-spectral imaging**, while **multi-polarisation imaging** opens up new pathways for inline inspection of glossy and transparent objects.

VisionBox LeMans – the unique embedded vision platform

VisionBox LeMans is the first industrial platform worldwide based on the fastest ARMv8 64-bit 8*Cortex-A72 @ 2 GHz multicore server/network processor. It features 8 independent cores each equipped with a NEON accelerator for high speed SIMD image processing. The compact, robust and fan-less platform can be easily integrated into the machine control system via PCIe boards optimised for vision tasks and provides two independent 10 GigE Vision ports for communication with the xposure camera network. The platform was jointly developed by AIT and IMAGO Technologies in Germany.

xposure LeMans – the future of embedded high-speed vision

xposure LeMans constitutes an ideally balanced technology package. It delivers unmatched speeds and high optical resolution, thus opening up completely new applications for machine vision. The xposure LeMans system thus leads the way to new and disruptive embedded high-speed vision solutions, in particular in the context of Automation 4.0.

Visit us at AIT stand 1D82!

xposure LeMans – Inspiring Resolution @ 600kHz				
	m/s	km/h	dpi	mm
Earth observation satellite	7200	25920		12,0
Aircraft	300	1080	50	0,5
ICE train	90	324	170	0,15
Web inspection	10	36	1400	0,018
Metal surface inspection	1,8	6,5	12700	0,002

Scientific Vision Days

Technology presentations at the AIT stand

This year we again invite you to attend **presentations** on the latest innovations and technologies in the field of image processing. The presentations are given directly at **AIT stand 1D82** by AIT experts, as well as customers and partners from industry and research. Programme details are available at the trade fair and at **www.ait.ac.at/svd**.

Contact

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