

MACHINE VISION FOR MECHANICAL & PLANT ENGINEERING

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INSPECT

INSPECT's Branch Newsletter for VISION 2011 | October 2011

Dear Readers,

Records are there to be broken. This is something of which the Stuttgart trade fair is well aware – and with regard to the development of this year's VISION exhibition it is on the right path. At least the figures prove that the organizer is right: After the 300 mark was exceeded last year with 323 exhibitors, 340 exhibitors are expected this year. However, the international specialist exhibition not only showcases over 300 exhibitors on an area of 20.000 m² but also shows current trends and developments.

For example, the industry agrees that 3D image processing is one of the key topics of VISION 2011. According to surveys within the industry by the VDMA and the EMVA, „in image processing, the third dimension has turned out to be an innovation driver.“ As both innovations and the companies which exhibit them need space, if there is a further increase in the success of the exhibition, it will be relocating to hall 1 next year. However, this year the exhibition will be held as usual in halls 4 and 6 from November 8 to November 10. In spite of this, there will be a new feature this year: the Medical Discovery Tour. Because a survey revealed that medical technology is highly popular with both visitors and exhibitors, this year there will be a special show on this topic. As you can see, the fields of application for image processing are very varied. You can get a small preview of just how varied they are in this newsletter. Here we present applications in which image processing is the solution for many problems. And now, we hope you have fun on your discovery tour through the world of image processing.

Your INSPECT Team

Search Robot

With USB 2.0 Single-Board Cameras in Search of Trapped Persons

After natural disasters like earthquakes there are just two aspects which are important: speed and special equipment. To develop the latter is the aim of the project which was initiated by the ETH Zürich – a worm-shaped robot is the beginning.

Earthquakes always cause destruction and misery. Additionally, to the already chaotic situation the difficult logistics and possibly negative environmental influences are resulting in an increase of pressure and delay in the rescue. However, prompt action is very important, because the probability of surviving of trapped persons reduces seriously after 72 hours.

By enlarging the rescue equipment with a system that can conquer the debris, trapped persons can be searched more efficient and localized precisely.

Worm-Shaped Robot

In September 2010, the ETH Zurich initiated the project Traloc to improve this situation. The aim was a worm-shaped robot, which supplements a more precise and faster possibility to locate victims. The camera system in the head part is the central element to control the robot. It consists of two WideVGA CMOS cameras to identify the environment and to map the environment in three dimensions. The evaluated mvBlueFox-MLC200w camera from Matrix Vision scored especially with its comprehensive features and simple handling. The compact housing and the



possibility to connect the camera via ribbon cable allowed using the installation space in an optimal way. The sensor of the mvBlueFox-MLC200w camera meets the application demands with the features HDR (High Dynamic Range) and Global Shutter. A very full and well-structured documentation supports an efficient installation of the cameras. Because the system is a first prototype, there are many improvements possible. The system in the present state is not sealed and for this reason it can only be used in clean environments.

www.matrix-vision.com


VISION
2011

Hall 4, Booth B31

Money, Money, Money

Vision Sensors improve Coin Roll Inspection Productivity

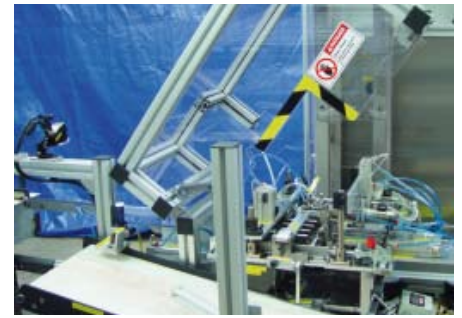
In the past Royal Canadian Mint (RCM), producer of coinage and currency has inspected the number of pennies in the rolls and the integrity of each package manually. Recently, RCM has improved efficiency by implementing a machine vision system.

Inspection applications such as this one have traditionally been manually inspected because of the challenges they present for automated inspection. But in recent years, vision systems have become more powerful and less expensive, so RCM decided to take another look at automating inspection of the pennies. RCM discussed potential automation solutions with Eascan Automation, a custom machine builder that provides mechanical design, fabrication, assembly, testing, service, and support of automated machine solutions.

"The cost of vision technology has dropped to the point that you can purchase a very capable system for under US\$ 1,000. The latest vision sensors are

self-contained and quite compact. Most important, point-and-click interfaces combined with high-level vision tools make it possible for even first-time users to configure and maintain vision applications in a matter of minutes," explained Phil Bernadin, Owner of Eascan.

"We selected the Cognex Checker 3G1 vision sensor for this application because of its low costs, small size and wide range of capabilities," Bernadin added. Checker vision sensors integrate lighting, optics, camera, processor, and I/O in an industrial IP67 housing small enough to fit into the tightest of spaces. Checker technology detects and inspects parts by understanding what they look like. This approach overcomes varying part



positioning which eliminates the need for costly fixturing. An intuitive GUI makes it possible for even a first-time user to setup an application in minutes.

"This inspection system offers advantages to the automated boxing machine," Bernadin concluded. "It has nearly eliminated downtime caused in the past when non-conforming rolls or ball bearings jammed up the machine. It inspects rolls

at a rate of 40,000 per shift, much faster than a human inspector, making it possible to increase the speed of the automated machinery."


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2011
Hall 4, Booth D63

www.cognex.de

Revealing the Unseen

Inspection of Solar Modules with New CMOS-4-MP-Camera

Solar modules should be featured by high efficiency and long-lasting photovoltaics. Therefore, a quality control has to satisfy the highest demands on optical inspection – a new 4-MP-camera with a high sensitivity in the near-infrared range meets the requirements.

Highly efficient, long-lasting photovoltaics are a key requirement for a breakthrough in developing renewable energies. Quality controls of solar modules must therefore meet the highest demands in terms of efficient, fast and automated optical inspection. The high sensitivity in the near-infrared range (NIR) offered by the new CMOS cameras, HXC20NIR and HXC40NIR from Baumer, is a convincing answer to these challenges. Compared with the monochrome cameras available until now, the new models are twice as sensitive at a wave length of 900 nm and therefore master the requirements of checking solar wafers even more effectively. Therefore the cameras are even more

sensitive than systems with NIR-optimized CCD sensors.

High Resolution Simplify Inspection

A resolution of 4 megapixels with a 1:1 (2,048 x 2,048) aspect ratio optimally qualifies the HXC40NIR to inspect square solar wafers. The desired product quality is ensured by using the electroluminescence method to check the crystal structure for defects. The high resolution enables complete modules to be inspected with fewer cameras, thereby simplifying and reducing the cost of inspection. Excellent image quality with low readout noise is ensured by the high-performance Global Shutter Sensor from



CMOSIS with Correlated Double Sampling (CDS). In addition, several image formats with up to 12 bits per pixel are supported. The cameras are equipped with a flexible CameraLink interface that permits the highest frame rates in the Base (3 taps) and Full (10 taps) modes. The robust, industrially suited design of the cameras makes them extremely reliable and an optimized thermal concept

allows them to be used throughout an expanded temperature range.

www.baumer.com


VISION
2011
Hall 4, Booth D25

Capture **Moving** Images

5 Megapixel Camera for Traffic Monitoring and Quality Control

Increasing demands in terms of resolution and detail are a trend for industry cameras – features which are required for applications in microscopy, traffic monitoring and quality control.

To meet the increasing demands in terms of resolution and detail, IDS now offers its 5 Megapixel USB and GigE cameras with the Sony ICX655 CCD sensor combined with newly developed camera electronics. The sensor achieves the full color depth of 12 bit per pixel and thus a 16 times more accurate mapping of the pixel values compared to the usual 8 bit. The camera is ideal for capturing moving objects due to the global shutter mode and hence simultaneous exposure. The camera models are particularly suited for applications in microscopy, traffic monitoring and quality control, e.g. in automated quality inspection of photovoltaic cells – whether print inspection, optical inspection or pattern recognition. Pixel by pixel

areas are inspected regarding color, surface, edges and geometries. The automated, detailed inspection helps to classify defects and therefore to effectively optimize production processes. This significantly reduces production costs and increases the efficiency of photovoltaic modules. But there is even more to the new camera electronics: The sensor delivers the same frame rate in triggered as in free-run mode: Up to 7 frames per second for cameras with USB and up to 10 for cameras with GigE interface. IDS will gradually enhance all current CCD models with this newly developed camera electronics and hence expand its product portfolio. The models will offer up to 100% higher frame rates compared



to standard CCD models. Additionally, operation in triggered mode achieves the same frame rates as in free-run mode as a standard feature. Horizontal and vertical binning allows even higher frame rates. Brightness corrections are easily realized using a convenient look-up table and Gamma. Data preprocessing in the camera saves CPU resources.

www.ids-imaging.de


VISION
 2011
 Hall 4, Booth C53

This Is Where **Trends** Are Set

VISION 2011 from November 8 to 10 in Stuttgart

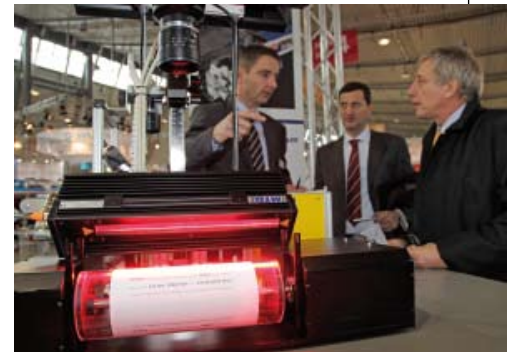
If the Who is Who of image processing gets together, it must be the VISION in Stuttgart.

You can look forward to new products, solutions and systems – and the trends which will be set at this year's Vision.

At last year's VISION, Olaf Munkelt, the chairman of the committee of the VDMA association for industrial image processing and manager of MVTec, defined 3D as the trend which will dominate image processing. The fact that 3D is one of the central topics of this year's VISION shows how fast developments are progressing. In the period from 2008 to 2009, industry surveys by the VDMA in the field of Machine Vision showed a dramatic increase of 10% to 15% in the proportion of 3D measurement applications. Relative to European image processing this was as high as 16%. Because of this, among other things, the more than 300 exhibitors at the VISION 2011 are presenting new 3D im-

age processing products, systems and application solutions. These include new equipment for recording 3D images as well as software tools for the evaluation and display of 3D data.

However, the third dimension is not the only trend which is occupying the image processing industry. Medical technology is just as popular. The Medical Discovery Tour is being initiated for the first time this year as a result of a survey of visitors and exhibitors, which named medical technology as a subject of increasing importance. With the exhibitors, medical technology takes fifth place with regard to relevance to visitors. The special show is a kind of medical technology obstacle



course. This means that products, applications or services concerned with the subject of medical technology are provided with a special logo in order to give visitors a better orientation.

In spite of the new program, visitors will still find familiar features such as the Integration Area or the Application Park. In 2011 the Application Park is starting its fourth round. Here, real-life applications are shown, e.g. how Playmobile figures are inspected, labeled and packaged. The Vision Academy and the special show of international image processing standards will be held once again.

www.vision-messe.de

VISION 2011 – Highlights

Medical Discovery Tour

Image processing is making its way into medical technology, and the Medical Discovery Tour, which is being presented for the first time this year, eases the path to the relevant exhibitors. The companies participating in this special exhibit on the subject of medical technology are indicated with a Medical Discovery Tour logo in both the exhibition catalog and in the exhibition itself and are therefore easy to find.

► Halls 4 + 6

VISION Academy

You never stop learning. There is always something new. Because of this, as in previous years, free seminars will be held on all three days of the exhibition. These will present application knowledge and technological know-how for both beginners and experts. Four seminars will be dedicated to subjects ranging from maintenance to mechanical engineering.

► Entry East/Atrium, opposite to the VIP Lounge

Industrial VISION Days

If you want to know which image processing topics are at the present focus of attention, you should not miss the lecture forum of the VDMA on industrial image processing. In specialized lectures, experts will describe the present state-of-the-art, discuss new camera interfaces and show new solution approaches.

► Hall 6, Booth A81

Integration Area

If you look, you will find. The Integration Area is intended for everyone who is looking for a very special solution. Here you can see at first hand how image processing is used in the car industry, mechanical engineering or in the food industry. However, you do not need to search for the way to the Integration Area – just follow the yellow carpet in Hall 4 and discover how varied image processing solutions can be.

Sponsored by INSPECT

► Hall 4, Booth A74-E31

Application Park

Return to childhood – you can do this in the Application Park, because here, Playmobile figures play a leading role. Here it is explained how image processing, handling technology and automation intermesh in the production of the figures. In 11 modular inspection and processing cells, color detection, inspection for scratches and geometrical measurements are carried out. And as usual, the very best comes at the end: you can take the Playmobile figures home with you as souvenirs.

► Hall 4, Booth A75

Special Presentation of International Image Processing Standards

Whether CameraLink, CoaXPress, CameraLink HS or GigE-Vision – each interface has its own strengths. In this special presentation, you can find out what these are, and which product provides the optimum solution for your application.

► Hall 6, Booth B73

Podium Discussion

As in previous years, INSPECT invites you to attend and investigate the question: What is Embedded Vision? Many questions about new markets, potentials and opportunities for image processing will be answered in the course of this round of discussions.

► Hall 6, Booth A81 (November 9, 14:00)

Venue:
Messe Stuttgart



Entry for navigation system:
Flughafenrandstraße/Flughafen in 70629 Stuttgart

Dates:
November 8-10, 2011

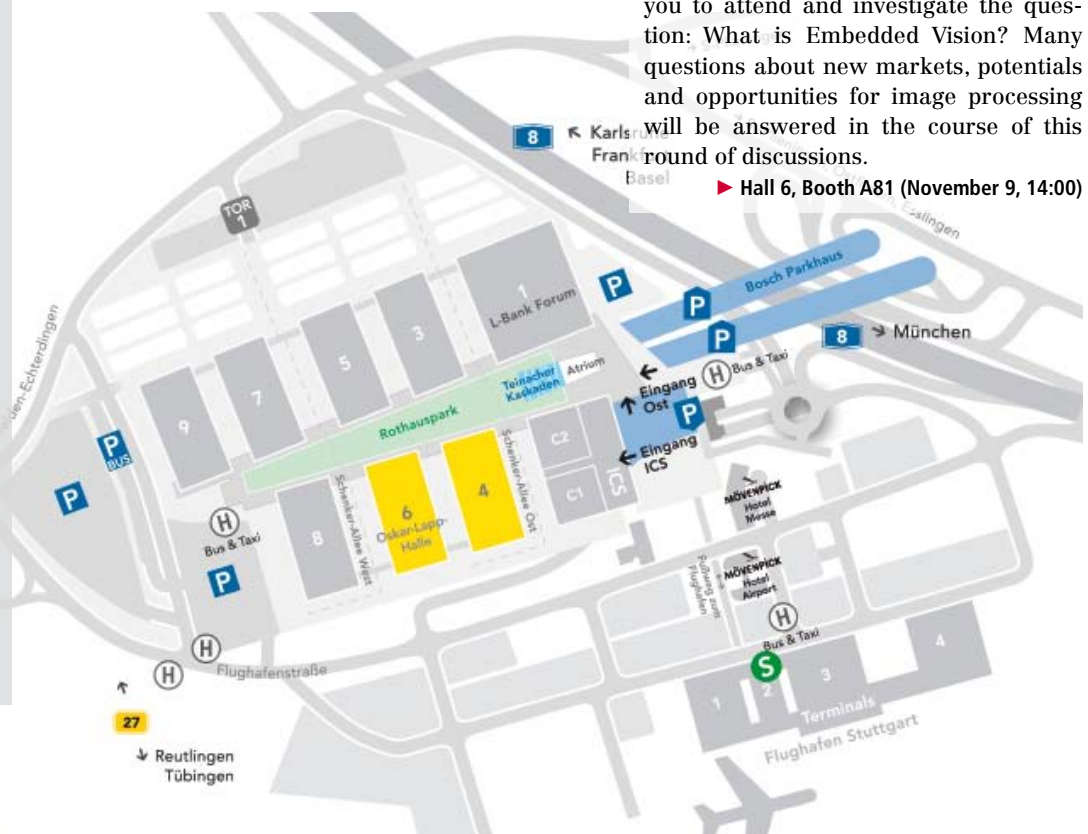
Opening times:
daily from 9:00 to 17:00

Ticket price:
Day ticket (incl. VVS) € 25.00
Reduced day ticket (incl. VVS) € 15.00
Full exhibition ticket € 40.00

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