

UKIVA news

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PPMA GROUP ASSOCIATIONS

UKIVA Newsletter Foreword, Autumn 2011

The last six months has again seen changes at the UKIVA. We were all very saddened by the death of Don Braggins, who played such an instrumental role in the foundation and development of the UKIVA. Denis Bulgin worked closely with Don for many years and has written a tribute to him.

There has also been a lot of great news and it has been particularly difficult to choose which items we should include in the newsletter. It is good to hear that the economic climate for vision companies seems to be improving steadily. Others have signed important agreements with overseas companies, which will lead to improved product lines or increased orders. Olmec and Multipix have taken on staff and I'm sure others have as well. Technology is advancing fast with members reporting exciting innovations, the development of new standards and the release of new cameras, hardware and software that will enable UKIVA members to develop better, faster or more cost effective solutions for their customers.

This newsletter features four pages of exciting application stories, which are examples of UKIVA member's successes. There were lots of stories submitted and it is with great regret that we don't have sufficient space to include them all. Vision technology has huge potential to make a contribution in a vast and diverse range of applications and this is demonstrated in these stories which range from Stemmers contribution to train safety, quality control on a biscuit production line by Multipix or the development of a vision system by Cognex that will help blind people to work.

PHOTONEX 2011 is rapidly approaching and we are proud to have been able to put together an exciting and diverse set of seminars from UKIVA members. As 3D cameras are becoming more affordable and better, then so 3D vision applications are taking increased prominence and this is reflected in the program with three of the six seminars discussing 3D vision with example applications. The seminars are free to attend; there will be demonstrations and an opportunity to talk to the presenters during the day.

John Haddon, UKIVA Technical Consultant.
Email: technical@ukiva.org
Director, Panther Vision.

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UKIVA will be running
FREE seminars at the event

Vision and Imaging Technology Demystified: Innovation and Application Advances

- Software tools for 3D machine vision – how to select the right method, by Multipix Imaging
- Live demo of a 3D stereo camera system, by Scorpion Vision
- Structured Lasers as an aid to Machine Vision, by Alrad Imaging
- The challenges of lighting – Too little, too much, the wrong kind, by Leuze electronics
- IR and UV camera technology, by Stemmer Imaging
- Hyper spectral Imaging – the journey of the photon and seeing the invisible, by Gilden Photonics

For more details of the exhibition and what it has to offer please visit www.photonex.com

A Tribute to Don Braggins

Don Braggins was hugely influential in establishing the UKIVA as the Association it has become today. In an imaging career spanning five decades, he was both well-known and respected in the vision industry and was a keen networker, visiting companies, exhibitions and events around the world to keep himself informed of new developments. He was elected a Fellow of SPIE in 1990.

Don's involvement with the UKIVA began in 1992 when his company, *Machine Vision Consultancy* was a founder member. In 1995 he took over the administration of the Association and provided the first line of technical advice. He oversaw the transition of the Association into a

'Special Interest Group' of the Processing & Packaging Machinery Association in 2009, and remained a consultant to the Association until 2010. He also took part in the ad hoc meetings that led to the formation of the European Machine Vision Association in 2003 and served on its Executive Committee for six years.

Don also authored numerous articles in publications in many industries, including many in *Automation* - to inform industry at large of the benefits of vision. His writing career included a spell as Associate Editor for *Machine Vision* for the SPIE journal, *Optical Engineering*.

Don's consulting activities continued until 2008, though in the later years he mainly advised on actual or potential start-ups, or investments into companies offering vision products. Don passed away in May 2011, aged 70, leaving his wife, Anne, two children and five grandchildren.



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Members news



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ACTIVE SILICON

CoaXPress standard gets overwhelming approval

Active Silicon are one of the three primary developers of this new technology. CoaXPress (<http://www.activesilicon.com/products-coaxpress.php>) which is now an official JIIA (Japan Industrial Imaging Association) standard (http://www.jiia.org/st_download_e.html) and set to become a world standard. Active Silicon technical director, Chris Beynon, is one of the three main authors of the standard.

'We are pleased and proud to play a major part in the development of CoaXPress . . . We anticipate significant industry take up of this technology over the next couple of years for which, of course, we are now developing products' said Colin Pearce, Active Silicon CEO.

ALRAD IMAGING

Present new camera lens suppliers

Alrad can now provide camera lenses from some 15 different manufacturers and suppliers. Latest additions to the range of lens products are from Spacecom, Azure Photonics, Lensation and Schneider Optics. We also now have closer ties with FUJINON and we buy lenses directly, therefore enhancing our customer service. So, with such a wealth of products available, make us your first call for all your lens requirements. For more details see <http://www.alrad.co.uk/imaging/Lenses%20Home.html>

COGNEX

In-Sight Explorer 4.5

Cognex Corporation has released a version of In-Sight® Explorer 4.5 expanding the capabilities of In-Sight

vision systems and giving In-Sight the most advanced inspection tools available today. In-Sight Explorer 4.5 inspection tools now include an all-in-one edge and surface inspection tool, an all-in-one bead width and position tool, and a robust ID tool that reads multiple codes at one time, allowing In-Sight cameras to read barcodes and provide inspections simultaneously. The Flexible Flaw Detection (FFD) edge and surface inspection tool works for both colour and grayscale applications and is used to inspect for boundary defects and can also be used for print inspections, like inspecting screened logos for defects. ReadIDMax, was also added to In-Sight Explorer 4.5 and is based on the powerful and field-proven ID algorithms 1DMax™ and 2DMax™ for 1-D barcode and 2-D matrix code reading.

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- . Cameras
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FRAMOS

Kyocera's new seven-inch high-brightness WVGA LCD module

Framos Electronics makes available the new Kyocera seven-inch LCD module. Key features of Kyocera's new seven-inch LCD within its enhanced product portfolio include WVGA resolution, long life LED backlight with up to 70,000 operating hours, a brightness of 700 cd, a slim housing and a viewing angle that covers the needs for industrial use, thanks to its latest display technology. A variety of benefits make this ideal for use in systems within industrial or medical applications.

Strobe controller series

Framos Electronics and Smartek, a Croatian electronics company, announce high-end LED illumination controllers for professional applications. Smartek's Strobe Controller (SC) series is renowned for its switching capacity and precision for industrial machine vision applications. Latest models have Ethernet or RS232 control interfaces, with full SDK support for both Windows and Linux o/s. The family of strobe controllers features 1, 2, 4 or 6 parallel channel options, both digital and analogue light-head coding, an integrated temperature sensor and built-in power supply. They can deliver high power pulses of up to 8A and 200V per channel at 1µs pulse duration.

LAMBDA PHOTOMETRICS

Dual GigE technology doubles standard GigE bandwidth to 240 MB/s

Baumer's new SXG cameras combine state-of-the-art Quad Tap sensors from Kodak with innovative Dual GigE technology.

This provides the perfect solution for applications that require excellent image quality and high frame rates simultaneously. Thanks to the new

interface technology, the images with resolutions from 1 to 8 megapixels and frame rates of up to 120 fps are transferred to the PC via standard GigE interface boards. With the capability of transferring at 240 MB/s, the full potential of the Kodak Quad Tap sensors can now be utilised.

With a transfer distance of 100m, the Dual GigE interface offers all the advantages of the standard GigE interface.

Baumer uses dynamic LAG to configure the Ethernet ports automatically, eliminating possible error sources right from the beginning. The redundant communication link of the Dual GigE system provides better transfer security, ensuring data transfer and reliable camera operation even if one of the two Ethernet cables is disconnected.

LEUZE ELECTRONICS

The world's smallest contrast sensor

Contrast sensors, also called contrast scanners, are widely used in packaging machinery and automation technology, for example for the detection of print registration marks. Leuze electronic have a wide range of contrast sensors in a variety of housings, which help ensure labels are correctly positioned on many everyday items.

Leuze electronic's new KRT 3B contrast sensor is the smallest in the world, fitting within what Leuze call a 'three series' housing and being the same size as a hundred other Leuze sensors. It is also a high-performance device, equal to larger units in terms of its function and its range.

Performance such as extremely short response times of 50 µs and high repeatability, as well as features such as IO-link make configuration and implementation easy. Three teach processes: 2-point teach, static 1-point teach and dynamic 2-point teach, provide optimal set up for every type of machine use.

MATROX

Iris GT smart camera now offers 5 megapixel sensor

High-resolution smart camera accurately inspects large parts and packages. 'A high resolution sensor, like the one found on the Matrox Iris GT5000, is required to accurately inspect larger parts and packages. Matrox Iris GT5000 is the highest resolution version of the Iris GT smart camera available today', explains Fabio Perelli, smart camera product manager for Matrox Imaging. The sensor on the Matrox Iris GT5000 is 2448 x 2050 pixels @ 15 fps 2/3" monochrome CCD.

Powered by an Intel® Atom® 1.6 GHz processor, Matrox Iris GT runs Windows® CE 6.0 or Windows® XPe and features an integrated graphics controller with VGA output, 512 MB DDR2 memory, and a 2 GB flash disk.

GatorEye GigE Vision® camera features laser line extraction for 3D scanning

Industrial camera has IP67 rating and is designed for the harshest environments.

For triangulation-based 3D digitizing applications, the Matrox GatorEye extracts the laser line in an image to sub-pixel accuracy and produces the corresponding positional depth/height array. Only the resulting array is transmitted, which lightens the load on the Gigabit Ethernet link and PC. The PC can then focus on other tasks, including 3D measurement and analysis.

MULTIPIX IMAGING

MultiPix evolve with new appointments

Multipix Imaging is pleased to announce that Simon Hickman has recently been promoted to the position of sales director. Simon has been a senior member of the sales team at

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Multipix since 2005, and sales manager since 2009, with many more years of experience in the machine vision industry. Mike Morgan has also been promoted to senior sales engineer and there is a new member of the team, Matthew Walsh, who is appointed as internal sales engineer.

Small but mighty Basler Ace 5-megapixel camera

An incredible price and performance ratio in a compact housing! Multipix Imaging launch the Basler Ace 5MegaPixel Camera, the perfect choice when you face a price-sensitive application that needs a high resolution. These cameras combine the compact 29mm x 29mm x 42mm Basler ace housing with Gigabit Ethernet interface technology, power supplied via Power over Ethernet, and a 5MP CMOS sensor that is able to deliver 14 frames per second. They consume only 2.5 watts, which results in low camera temperatures and means that they can even be used in small, closed environments.

NATIONAL INSTRUMENTS

Engineers can more easily search and download new drivers with IDFinder in NI LabVIEW

National Instruments now offers more than 9,000 drivers from more than 350 vendors through the Instrument Driver Network (IDNet, www.ni.com/idnet) that simplify and automate connection to stand-alone instruments. IDNet, the industry's largest source of instrument drivers, includes more than 1,000 new drivers added since November 2009. The drivers are written for the NI LabVIEW graphical development platform, the NI LabWindows™/CVI ANSI C integrated development environment and Measurement Studio for Microsoft Visual Studio. Engineers, scientists and instrument manufacturers around the world have relied on National Instruments software and instrument drivers since the first version of LabVIEW was shipped in 1986. With the latest version, LabVIEW 2010, engineers can use the new Instrument Driver Finder (IDFinder) to quickly search IDNet and

download different LabVIEW Plug and Play instrument drivers for their stand-alone instruments. IDFinder scans the system for connected instruments; downloads and installs the appropriate drivers; and presents ready-to-run examples to the engineer. IDFinder significantly reduces time to first measurement by helping engineers get up and running without leaving the LabVIEW environment.

OLMEC UK

Expansion at vision systems integrator

Vision systems integrator, Olmec-UK Ltd, has announced the expansion of its mechanical design and on-site installation departments in response to significantly increased levels of business. Petra Millberg has joined the design group, while Andrew Pounder has strengthened the company's on-site systems integration team. Petra has a Masters degree in mechanical engineering from the University of Florida and is specialising in conceptual design and documentation on Olmec-UK projects. Using the latest 3D modelling techniques, she is involved in specifying the optics required for the particular project and ensuring that the cameras, illumination sources and optics can all fit into the available space and with the required geometry.

SCORPION VISION

SmartVision lights distribution agreement

Scorpion Vision Ltd is pleased to announce it has been awarded a new distribution agreement from US based SmartVision Lights. The intelligent, or smart driver provides a constant current to every machine vision light, guaranteeing optimal performance at all times. This of course negates the problem with failing vision systems due to faulty illumination problems. Smart Vision Lights uses only high-current, HB (high brightness) LED's in their machine lights. Smart Vision Lights designs, manufactures and markets a line of products that apply the benefits of high current LED's for use in machine vision applications. All

machine vision lights us standard industrial 24VDC for operation. For more info visit: <http://scorpionvision.wordpress.com/>

SICK

Compact optical level switch for rapid commissioning

SICK (UK) has added to its industrial instrumentation product portfolio with a new compact optical level sensor switch for aqueous fluids. Designed for robust level monitoring of a range of liquid media, the FDA-compliant MHF15 is ideal for a variety of applications, including tank level monitoring or dry running protection for pumps. The cost-effective plug-and-play solution, which requires no calibration and minimal maintenance, can be used for overflow protection and low level indication in tanks to monitor the presence or absence of liquids. A normally open or normally closed transistor output is provided for use as an input to control PLCs or relay modules.

STEMMER IMAGING

3-CCD RGB colour cameras now available with GigE Vision

The JAI AT-140GE and AT-200GE 3-CCD cameras are available from Stemmer Imaging. Bringing the connectivity benefits of GigE Vision to 3-CCD technology, these new cameras feature a newly developed prism-block assembly to support the three CCDs. The new dichroic prism block splits the incoming light into three distinct colour channels for precise RGB values and provides higher resolution and better light gathering ability than earlier 3CCD camera models. With precise sensor alignment (less than 1/4-pixel tolerance), this 3-CCD configuration offers better colour and spatial precision than single-CCD cameras which use Bayer filters and interpolation algorithms.

New range of low-cost LED illumination announced

Stemmer Imaging has introduced the MetaWhite™ ExoLight range of LEDs as an alternative to fluorescent lighting for machine vision. Patented and

patent-pending LED technology and advanced optics create an extremely even and diffused cool white illumination three times brighter than fluorescent sources over a longer working distance. The LEDs feature anisotropic plastic micro-lens diffusers to create a highly diffused light from multiple point source emitters. The resultant output mimics that of fluorescent emitters, but with more power and a greater stability, combined with the legendary LED lifetime and a low cost of ownership.

New models in affordable GigE camera range

Stemmer Imaging announces that AVT has added a new camera to each end of its highly competitively priced range of Manta GigE Vision cameras. Available in both monochrome and colour variants, there are new 5Mpixel and VGA (0.33 Mpixel) resolution versions of these robust cameras which can be used in industrial inspection and automation, logistics, intelligent traffic solutions and traffic monitoring.

Also new for the entire range is the modular concept which includes a Power over Ethernet (PoE) option. For even more flexibility, all Manta models now offer optional housing variations from the AVT modular concept. A new range of IDS uEye GigE cameras is now also available.

To distribute LMI technologies' 3D smart camera in Europe

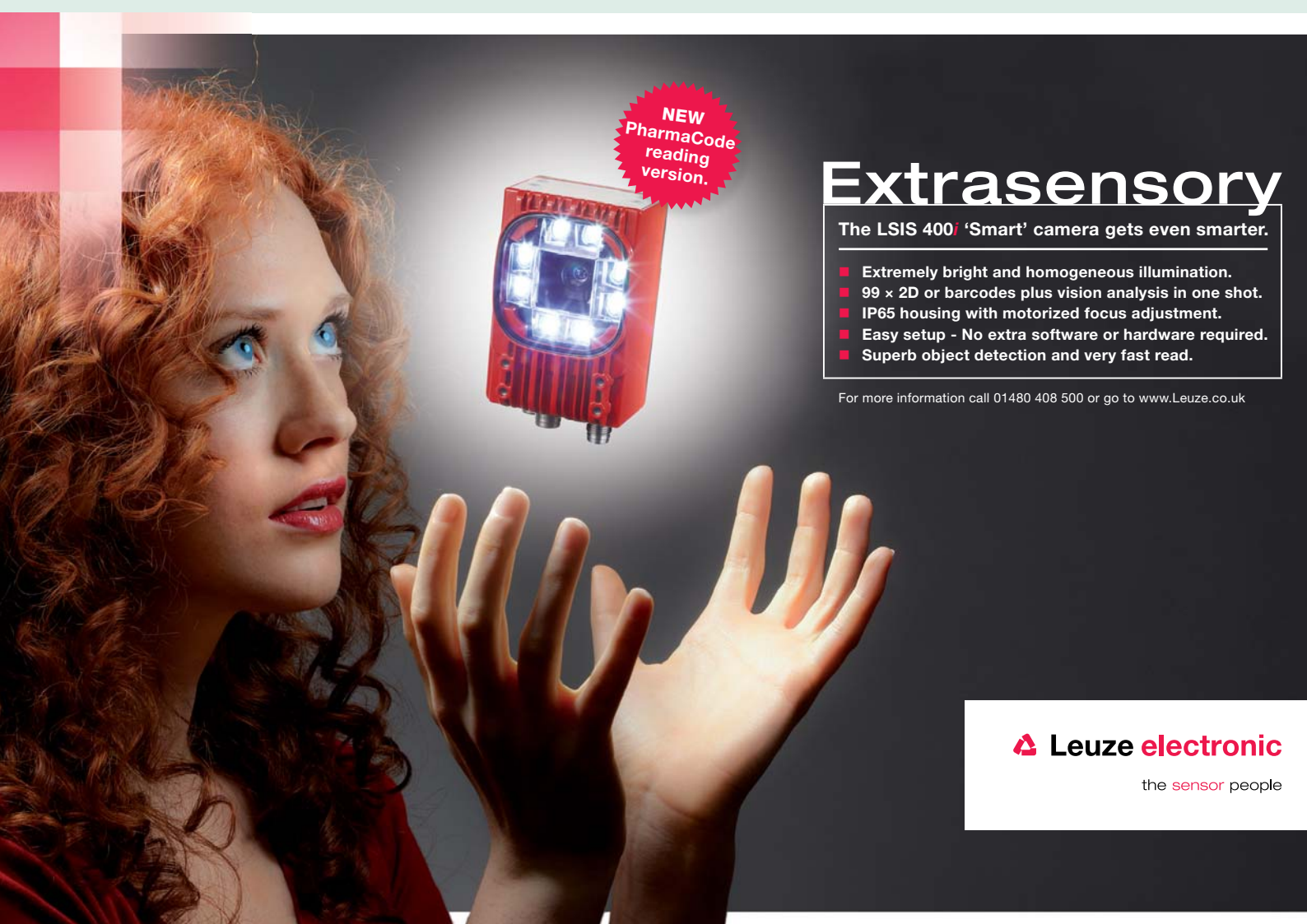
Stemmer Imaging and LMI Technologies Inc have signed a distribution agreement that will make LMI's Gocator 2000 series of smart 3D sensors available in Germany, UK, Ireland, France, Austria and Switzerland. Gocator is a new, simple-to use, all-in-one solution that makes 3D measurement and control for

factory automation accessible to all levels of users. Gocator 2000 series is an exciting new breed of pre-calibrated sensors that make industrial 3D measurements more affordable and available to a wider range of applications. Ease of use is leveraged by the built-in web server as an effective GUI for rapid set-up and control. Users can connect, set-up exposure and speeds, visualise profiles, measure dimensions, select communication outputs, and monitor results using Firefox, Internet Explorer, Chrome, or Safari web browsers. This built-in web connectivity enables users to access the sensor from any PC without software, drivers, control boxes, amplifiers, or dependency on a specific operating system.



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Scorpion Vision Ltd is the UK representative of Tordive AS of Norway. Founded in January 2006, the company has the remit to promote, advise and manage sales and support of Scorpion Vision Software.
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| Kingston University | http://dirc.king.ac.uk | Digital Imaging Research Centre |
| Oxford Brookes University | http://cms.brookes.ac.uk/research/visiongroup/ | School of Technology - Computer Vision Group |
| University of Leeds | www.comp.leeds.ac.uk/vision | School of Computing |
| University of London | www.cs.rhul.ac.uk | Royal Holloway |
| Vision Academy | www.vision-academy.org | Systematic Training for Machine Vision |
| University of the West of England | www.uwe.ac.uk/cems/research/melmsmith/ | Faculty of Computing Engineering and Mathematical Science |
| University of York | www.elec.york.ac.uk/research/intsys/visual.html | Department of Electronics, Visual Systems Lab |

For information on courses and job vacancies from our members please visit www.ukiva.org

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Application stories

RNA Automation • Multipix • Cognex

STEMMER IMAGING

On-board and trackside railway inspection

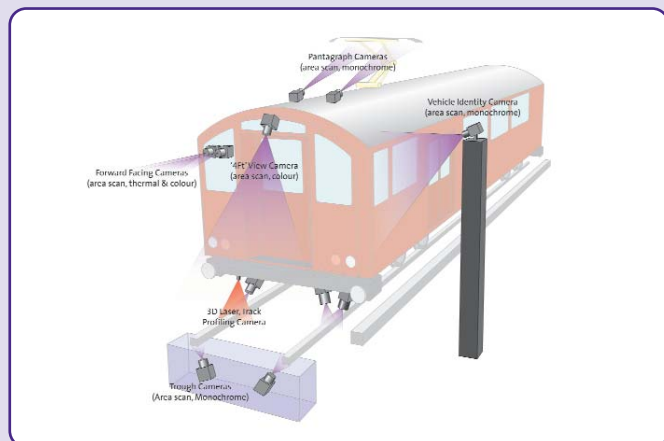
Cameras and image processing techniques originally developed for machine vision applications have been used for a host of railway inspection applications. Depending on the application, cameras of various types can be located on the train itself or by the side of the track. Railway inspection techniques present a significant challenge to the vision industry. Not only is a wide range of imaging devices, including area scan and high definition cameras, linescan cameras and thermal imaging cameras, required, the operational conditions are demanding. Cameras and imaging systems can be exposed to extremes of weather, vibration and physical wear. Stemmer Imaging has a comprehensive set of products that cover the entire range of components and services required by an imaging solution and have experience of working on a number of railway projects throughout Europe.

Trackside applications

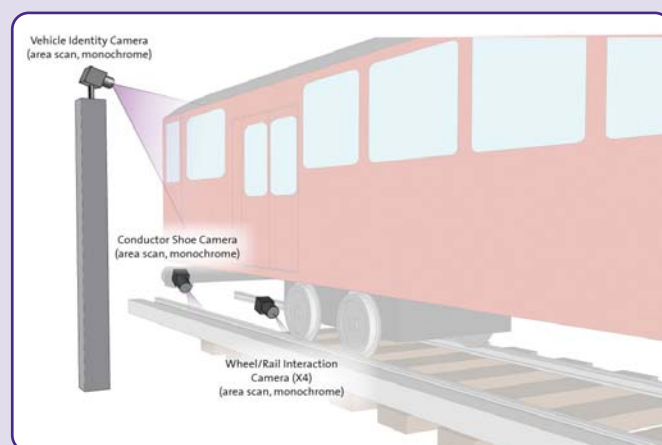
Trackside mounted cameras can carry out a variety of tasks. Cameras mounted on posts can be used, for example, for vehicle identification and to inspect passing trains for graffiti. Other trackside applications include cameras mounted in troughs on the track pointing at the brake shoes which can be used to evaluate brake shoe wear or to examine the wheel profile for damage and wear as part of a predictive maintenance schedule.

Train mounted applications

Monochrome, colour and thermal cameras can all be mounted in a forward facing position (to give a driver's



eye view). General monochrome cameras give a good understanding of the items that are beside the line such as trackside cabinets and huts etc and so can be used for asset recording and mapping with accuracy to within a couple of metres. Thermal cameras can be used to check that heaters are working in trackside cabinets (which can be important for operation of the signals); that points heaters are working to clear winter ice or to locate hotspots generated by the breakdown of insulators on the third rail. Forward facing cameras can also be mounted near the top of the train pointing downwards to give the '4ft view'. This replicates the view a track inspector would have and is used for checking ballast, missing clips, tie bars, inspecting points etc. Although the assessments are still made by a human inspector reviewing the video recorded by the cameras, the use of cameras avoids the need to close the track for the inspection, saving both time and money.



OMRON

For potato packing, Omron goes beyond inspection

When Greenvale, one of the UK's leading suppliers for fresh potatoes told Omron that it needed a vision inspection system to check that the correct promotional labels had been applied to packs of potatoes destined for major supermarkets, the Omron engineers decided to look at the requirements in a little more detail. The result of their deliberations is a system that goes beyond simple inspection, and integrates tightly with Greenvale's ERP systems to eliminate the risk of packaging and labelling errors.

At PPMA Exhibition in 2008, managers from Greenvale discussed with Omron requirements for an automated system to check that the correct promotional labels

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FQ VISION SENSOR

The FQ difference...

Omron's new FQ redefines the vision sensor market, offering unrivalled functionality, crystal clear images and totally flexible operation. Intuitive, icon driven menus provide users with simple and fast set-up, requiring no previous vision knowledge.

The FQ includes many unique functions including HDR processing and built in polarisation filters to provide crystal clear images, an industry first for vision sensors, resulting in robust and reliable inspections, without any complication.

- Easy set-up via PC or TouchFinder screen
- Powerful inspection tool library
- High resolution (752 x 480 pixels)
- Industry first - Real Colour Processing (16million colours)
- Industry first - HDR processing (High Dynamic Range)
- Flexible operation - standalone or networked

Omron Electronics Ltd
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had been applied to packs of potatoes before being shipped to retailers. At first sight, the solution seemed straightforward – equip the packaging line with an Omron vision system to inspect the labels and thereby ensure that they correctly matched the label type entered by the line operator.

However further analysis revealed, that there was a significant flaw in this approach. Relying on the line operator to tell the vision system what type of label to expect was unlikely to be satisfactory, as the operator would be virtually certain to select the type of label he or she had just loaded into the machine, even if this was the wrong type. In these circumstances, the vision system would pass all of the packs as satisfactory, but they could still be leaving the plant incorrectly labelled.



What was needed was some way of telling the vision system which labels should be affixed to a batch of potatoes, without involving the line operator. Omron engineers discovered that when a new order is set up on the packaging line, the plant's ERP system can download all of the data corresponding to that order – including the type of promotional labels to be used. All that was needed was to find a way of making the label data from this available to the vision system.

For most automation suppliers, the only way of doing this would have been to develop special software routines to allow the transfer of data between the ERP system and the vision system. This would have been a time consuming and expensive process. However, Omron's CJ1 programmable controllers (PLCs) can optionally be fitted with an SPU (storage and processing unit) that is specifically designed to make it easy to transfer data between the PLC and external computers. By using the SPU, the labelling data could be acquired from Greenvale's ERP system using only standard hardware and software, thereby providing a straightforward, reliable and inexpensive solution. The packaging line automation and inspection system can be readily linked with the ERP system and this opened up additional opportunities. For example, it was now possible to check automatically that the correct type of film was being used for packing the potatoes. This was done by adding a two-dimensional (2D) matrix code to the packaging.

MULTIPIX Machine Vision Imaging Solution takes the biscuit

The Food and Beverage industry has become extremely competitive and consumers continue to expect high quality and excellent presentation. Those who buy a packet of biscuits want consistent size, weight and quality of each single biscuit. The main objective of the biscuit manufacturer is to achieve economic production by being smart with the resources and packaging. They need to react quickly and reliably to disturbances in the production process. Therefore, process data has to be acquired and stored continuously.

One of Europe's leading biscuit manufacturers approached Machine Vision Technology Ltd. to automate the size and the weight control of their biscuits during the production process. The biscuits are on a conveyor belt with 120 columns of 30 cooked biscuits. Two of the biscuits are combined with a filling and result in a 'sandwich biscuit' with two 'sides' and a fondant filling (such as chocolate) in between. The aim is to ensure all 'sandwich biscuits' are the same height and weight. Filling is expensive in comparison to biscuit costs so the idea is to minimise how much filling is used to create the correct 'sandwich biscuit'.



Machine Vision Technology Ltd approached MultiPix Imaging, a UK vision components supplier for advice on Camera and Image Processing Software selection. The solution consists of three Basler Scout cameras (scA1390) being used to grab images of the biscuits from above and HALCON Imaging Software which will analyse the image to measure the length and width and ascertain if the biscuit is the correct size. A fourth camera, the Basler scA640-120gm is used in partial scan mode for higher frame rates, grabbing a laser line profile of the biscuit from which the HALCON Imaging Software constructs a 3D image and obtains accurate height measurements. Using this procedure, accuracies of ± 0.17 mm can be obtained for the length width and thickness. The custom front end of the software incorporates an average size display for the measurement over the last 100 rows. These statistics are stored against time and date

for four years to satisfy customer traceability demands. Information on the system is available on a duplicate screen display 100 meters which can be monitored by an engineer. The operator can easily select from a drop down menu for product changeover.

OLMEC UK

Missing codes and characters, partially printed codes, smudged print and incorrect codes were just some of the problems faced by one leading supplier of vitamins, minerals and supplements in its coding and labelling process. Differing lot code demands and requirements worldwide posed the greatest challenge for Olmec as the customer sought a turnkey, fully integrated vision system capable of inspecting the lot code quality of all its product labels. The sheer volume of label variants meant that the solution had to be capable of verifying codes whilst simultaneously detecting changing batch code orientation, differing quantities and location of characters and of neutralising the numerous background colours presented such as yellow, blue and red. A single, intuitive vision solution capable of fully validated character recognition, character verification and robust 2D data matrix handling and grading, was developed and installed on 3 inspection lines. This can be used for tasks ranging from simple verification through to GS1 and CIP13 conformance. The system uses an Omron SC2M 2 Megapixel colour camera connected to an Omron FZ-9 vision controller which enables the use of multi threading for high speed processing. The code to be read was illuminated using an on-axis light source. The system quickly checks characters and label format by auto detecting the lot code location and then automatically setting itself up for the forthcoming job. By filtering out all the background colours, the system is able to extract only the lot code, which is then verified against operator-entered information. From 100s of label variants the possible format combinations were condensed into 6, quickly configured job files. Capable of inspecting labels statically or at high speeds the system provides a batch report at the completion of each job, supporting production traceability. The system is completed by a simple, touch screen user interface allowing for rapid operator configuration.

As a systems integrator, a key role in the project was ensuring that the code reading system integrated seamlessly with the production lines. Olmec worked closely with the labeller manufacturer to interface the inspection system so that incorrect labels could be rejected before application to the product. In addition remote connectivity via a VPN was built-in to provide a remote monitoring and diagnostics capability. Full IQ and OQ documentation was provided and the IQ and OQ phases were confirmed with the clients' engineers during installation of the vision system before handing over to them for the PQ phase.

RNA AUTOMATION Machine Vision Solutions for Food & Beverage Industry

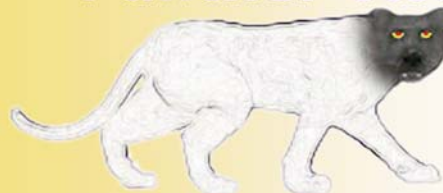
RNA were contacted with a request for a fully automated quality control and inspection system to handle and inspect plastic moulding components. The request was from a recently built UK based production requirement for a global leader in the food and beverage industry. The system must handle with minimum changeover two components that are physically different in size and shape. A major consideration in this application was the complexity and fragility of the component parts. The system must not cause any damage to these parts, which have a detailed periphery.

The system must inspect from all three planes: 1. Top for damage and OCR (optical character recognition); 2. Bottom for diameter and damage; 3. Side for damage, height and profile. The system must detect and expel 100% of those reject components, but critically must not damage the components. Additionally, the customer required a complete system with minimum requirements:

1. The system must be capable of operating at up to a rate of 1200 parts/minute
2. It must be designed to meet food and GMP standards.

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Panther Vision



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Dedicated to developing bespoke computer vision solutions to *your* problems, Panther Vision has world class expertise in computer vision and image analyses for a diverse range of applications. We want to use this expertise to enable *you* to meet *your* aspirations and to achieve your goals! We enjoy challenging and difficult problems.

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To enable the system to deliver 1200 parts per minute the design utilised a twin headed system with duplicate rotary feeders, conveyors, glass disc and reject segregation, with a common good part collection. This handling solution involved the innovative idea of a "rotating glass disc". The components are fed from a centrifugal feeder onto a conveyor system and fed individually onto a rotating glass disc. Due to the design of the components, they have a unique tendency to "castle or double up", causing problems in the handling and inspection, resulting in false rejects. These problems are one of RNA strengths and were solved with the expert use of gating and a non contact accumulation system, while still ensuring that there was no damage caused to the components.

An encoder and trigger sensor were fitted on the rotating glass disc. Once a component part had passed through the trigger sensor an encoder count is stored. The PLC then tracks the components around the disc triggering the appropriate cameras and ejecting reject components. Good components continue around the disk being gently swept off down a chute into a collection box. PLC monitors a count of all good and reject the components from both heads which maintain correlation over continuous 24/7 production.

Leuze Electronics

3D sensor systems –A new era is now affordable
New high performance 3D sensors and ever more affordable computing power offer an alternative to vision systems, enlivening the 3D discussion. As a manufacturer of both vision systems and 3D sensors, Leuze Electronics are in the unusual position of being able to discuss and advise on both technologies.

3D sensor systems are rapidly increasing in importance in the automation sector. In particular, they are moving from having previously been high-priced to a point now where they are affordable for general automation. Millions of optical sensors are used in measuring or switching systems, determining the distance or the presence of an object by emitting a single beam of light. Various forms of light are used dependent upon the application, with red light the most common, being economical and easy to use, because of it being easily visible. Ultra-violet light is used in sensing UV colouring. Contrast sensors, which are also called contrast scanners, use red, green, or blue light or indeed all of these in the form of white light, to look for specific colours such as print registration marks. Laser light being highly energetic is suitable for sensing over a greater distance. It also provides a finer resolution and hence accuracy for sensing edges, for example delicate cogs, or holes in a PCB. More recently camera-based vision systems which use surface illumination have become more common. These vision systems analyse the light/dark distribution of elements (pixels) within a 2 dimensional surface, usually

at a high resolution. If this 2D data is combined with distance information from an energetic single-beam system, this additional depth information provides a third dimension.

An alternative technology to combining a camera image and a sensor is to project a laser line across a section, which provides not only the location of each pixel in an x/y-coordinate system and its brightness value, but also the distance in the z-coordinate. For example, Leuze electronic's recently launched line profile sensor, the LPS36, projects a line up to 600mm long, which is equivalent to using a chain of 376 laser distance measurement sensors working together. The LPS sensor benefits from being perfectly calibrated the moment it is switched on and is used to take cross-sectional profiles or slices. An example system is Faude's "Flexvision" which gives a robot the ability to automatically detect components and pick from a tray. The sensor provides 2D cross-sectional profiles or slices across the tray, which the vision system constructs into a 3D image of the tray and its contents.

COGNEX

Vision system assists blind workers

Bosma Enterprises, an Indianapolis-based organisation serving the blind and visually impaired with employment opportunities, has for many years employed blind workers to package and ship surgical gloves from manufacturers to Veterans Administration hospitals around the U.S. Bosma has a contract from the VA Hospitals prohibiting the use of the corrugated cardboard packaging supplied by the manufacturer, because that material can harbour bacteria and parasites. Workers would now need to pack gloves in generic chipboard boxes, and create new labels that identified the product. In addition to the manufacturer's name and product type, the new labels had to contain the lot number, part number, size, and a barcode from the original boxes shipped by the manufacturers in order to comply with the manufacturer's product traceability requirements.

To keep the VA contract, Bosma needed to find a way to enable blind operators to read and enter information printed on the package shipped by the manufacturer so that new labels could be created for the contract-compliant chipboard boxes.

Bosma worked with the EMP Technical Group, a systems integrator that specialises in data collection equipment and labelling systems, to develop a system that blind workers could use to accurately recreate the correct labels for each manufacturer's box. The system combines a PC that contains a database of manufacturer names, glove type and model number, a Cognex In-Sight® Micro 1403 vision system to read and transmit the date/lot/batch information from the packaging supplied by the manufacturer, and a

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MULTIPIX LAUNCH 'INFO PACKED' WEBSITE



Multipix Imaging announce the launch of their new website which has been in development for six months. Packed with the latest machine vision products, news and industry views, this website has been

design to harness the power of .com communication. Interactive links with Facebook and Twitter ensures the latest news is shared quickly and efficiently. In addition to product related contents there is also an emphasis on white paper's and case studies, with the aim of being a resource centre for all levels of machine vision users.



Machine Vision courses from Leuze electronic

1/2 day workshops - Introduction to Machine Vision - FREE at St Neots

13th AM or PM or 14th September AM

An introduction to machine vision & 3D measurement. Topics will include:

- Sensors, Smart Cameras, Vision systems
- The importance of focus & lighting
- Vision vs 3D measurement systems
- Vision combined with barcode & 2D code reading
- Application examples
- Resources from Leuze electronic

1/2 day workshop - Machine Vision Applications - FREE

14th September PM

This session is an extension of the introduction sessions and will discuss in more depth applications and challenges in more detail:

- Application examples
- Challenges found in the real-world & tips on solving them

<http://www.leuze.com/uk/offers.html>

High Power LED Lighting solutions for Machine Vision applications



Currently leader in France, TPL Vision develops solutions among the most complex to answer your machine vision challenge.

The new Sentech GigE Camera series offers you a great of choice of capabilities



Sentech colour and monochrome digital GigE camera series are available in two designs:

Standard Models and **Power Plus Models** (with User FPGA). This series features VGA, XGA, SXGA, UXGA and QSXGA resolution CCD sensors, with framerates from 90 to 15 fps.



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machine for printing and applying the new labels.

Originally, EMP had tested a system that simply captured a photo image of the label, but that did not reproduce the label in a high enough resolution. The Cognex system produced a much more accurate and high quality label that met all of

the manufacturers' requirements for traceability. Without the Cognex camera, the visually impaired operator would need to read each character from the original packaging under high-powered magnification, taking a significant amount of time. The new system eliminates the need for this process, as well as reduces processing time and eliminates keystroke errors. In addition, totally blind operators would not be able to use the magnification system at all. The new system has increased productivity and allowed the company to work through a large backlog of orders.

New members

NEW UKIVA MEMBER – Leuze Electronic

Leuze Electronic is the newest member of the UKIVA, being better known across the packaging and process industries as being 'the sensor people'.

Leuze has joined the UKIVA because it has recently launched three new product ranges covering smart cameras, 3D measurement sensors and 2D profiling sensors.

Mark Weymouth, MD of Leuze electronic in the UK, explained: 'Leuze electronic differentiate ourselves by providing excellent service and support and therefore whilst Leuze has sold PC based vision systems within the German market for many years, machine vision is not an area we promoted in the UK because we did not feel we could support it well enough. However, with the launch last year of our LSIS400 family of smart vision cameras, and more recently the LPS 2D profiling sensors and LRS 3D measuring sensor families, we are able to provide excellent products and support within the UK'

Leuze Electronic frequently runs free-of-charge training workshops and invites people to check their website www.leuze.co.uk for details of the next workshop, or to come along to one of the lectures it is giving for local regions of the IET, or at the Photonex exhibition.

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Technical tips

Some useful technical tips from UKIVA members:

- **Very High Resolution Imaging (Stemmer Imaging)**

This technical tip looks at very high resolution imaging and covers a number of different camera types, including linescan, and CCD and CMOS area scan cameras as well as novel techniques for obtaining high resolution such as 'pixel shifting'.
www.stemmer-imaging.co.uk/en/pages/service/download.php?file=en_GB-TechTip-Very-high-resolution.pdf

- **Code Reading: Decoding Barcode and DataMatrix marks (Stemmer Imaging)**

This technical tip looks at the processes involved in reading, decoding and grading 1D and 2D codes using machine vision techniques. Some of the different types of codes and their uses in a variety of industries are also reviewed.

www.stemmer-imaging.co.uk/en/pages/service/download.php?file=en_GB-Code-Reading.pdf

- **What is sensitivity and why are sensitivity statements often misleading? (Multipix Imaging)**

This document explains how sensor sensitivity is just one of the factors involved in the output signal from a camera. Electronic devices in the camera such as Analogue to Digital converters and amplifiers also influence the output signal. It could be said that a camera's "responsivity" is a better measure of performance.

<http://multipix.com/wp-content/uploads/2011/07/Sensitivity.pdf>

technical@ukiva.org