




NEWSLETTER OF THE UK INDUSTRIAL VISION ASSOCIATION

ClearView Imaging
See our advert on page 7



MultiPix
See our advert on page 2



Stemmer Imaging
See our advert on page 9



Machine Vision Spreads its Wings

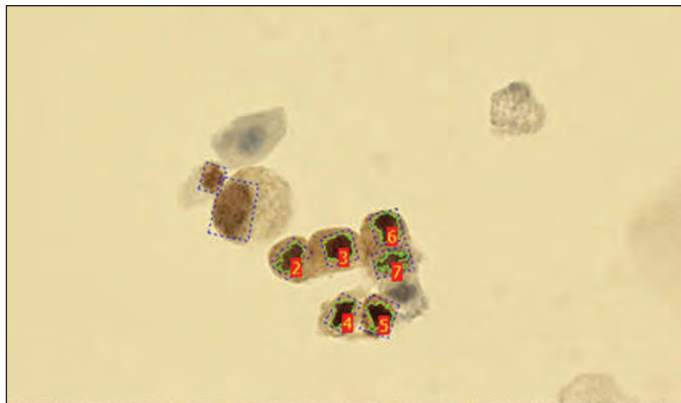
Helping the visually impaired to see and screening for bladder cancer are not applications normally associated with machine vision! However, many machine vision capabilities, such as colour recognition, pattern matching and optical character recognition, together with high speed image processing, have been utilised to address these very problems.

UKIVA member, National Instruments, have been working on a project with a team of scientists at The University of Oxford's Department of Clinical Neurosciences which had the goal of Improving the quality of life and promoting the independence of people with serious visual impairments. The team have developed and are trialling a special set of glasses (see picture) which makes use of the fact that most people who are registered blind are able to sense changes in contrast.

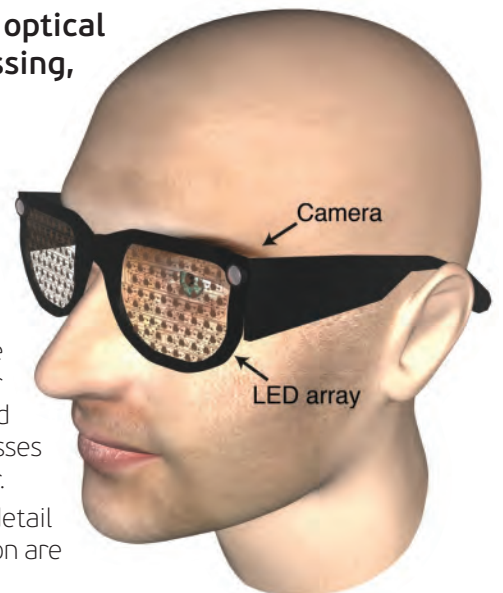
Images from tiny cameras integrated into the glasses are processed using the Vision Development Module in NI LabVIEW software to detect people, signposts or obstacles which need to be negotiated. The detected objects are simplified and displayed in real-time via small arrays of LEDs mounted in the 'lenses' of the glasses to indicate the position and class of object in the immediate vicinity of the wearer.

Standard processing functions within LabVIEW such as sub sampling and detail reduction via Gaussian blurring; pattern matching and optical character recognition are used as well as specially developed face detection algorithms.

Screening and diagnosis of cancer is a qualitative, subjective and labour-intensive process carried out by highly qualified cytopathologists using a microscope to look at cell samples that have been processed with specific marker proteins and stains to enhance the differential between



Sample image of cells with a selection stained, detected and analysed.



cancerous cells and healthy ones. UKIVA member Scorpion Vision has worked with Cytosystems Ltd and researchers in the Pathology Department at Aberdeen Royal Infirmary to develop an automated system for screening bladder cancer.

Scorpion's machine vision software drives a test sample to a set of co-ordinates via a motorised specimen stage on an optical microscope. An image is captured and analysed, initially for cells stained brown from the sample preparation, cells detected and measured for a range of attributes including shape. The image processing is carried out while the software moves the sample stage to a new location and the process repeated. The system automatically builds a set of statistics characteristic of the whole specimen. Part of the system requirements is that 90% of the definitively benign cases can be classified as such and the remaining 10% and all suspect, or samples considered malignant, are referred for specialist assessment.

These are just two 'non-industrial' applications that benefit from the qualities machine vision has to offer. There are many others!

CONTENTS

Foreword	2
Members News	3-8
Members Directory	10
Application Articles	11-14
Miscellaneous.....	15-16
Technical Tips.....	16

UKIVA contact
Janine Berriedale

UKIVA, New Progress House
34 Stafford Road
Wallington, Surrey, SM6 9AA
T: +44 (0) 20 8773 5517
E: info@ukiva.org

Design and Artwork:
Highlands Communications
E: bmh@btinternet.com

FOREWORD

by John Haddon



Welcome to the new style UKIVA Newsletter! We have restyled it to give more emphasis to members' activities and now have an exciting lead feature on the front page. We frequently forget just how widespread computer vision has become and the breadth of potential applications while we concentrate on our own niche.

The front page feature is an example of how computer vision can make a fundamental difference to life by helping to automate the diagnosis of bladder cancer and helping the blind 'to see'. In the members Application Stories we also hear how Panther Vision is developing a system to track a users gaze so that quadriplegics can interact with specialist computer software and gain more independence. Other Application Stories may be more conventional but still address challenging tasks, such as that by RNA with a vision guided robot on a production line making plumbing parts.

It seems that there is always more regulation being imposed but for a change it has created an opportunity for UKIVA members Olmec and Cognex. They have both implemented vision based systems to track pharmaceutical products throughout the production process and to help companies meet stringent pharmaceutical product tracking regulations.

There have been a lot of news items from members and it's been hard to identify which ones to include. The UKIVA has announced the first UK based award for the 'Most Innovative Machine Vision Project' and the UWE is developing a new MSc in Advanced Automation, Machine Vision & Management. USB 3.0 has been talked about for a while and Stemmer has introduced a range of new USB 3.0 cameras that will give a distinct advantage in terms of data transfer speeds and easy integration. Multipix has new products that enable analogue cameras to be linked into GiGe camera networks which could benefit legacy systems.

As the UKIVA Technical Consultant I offer expert advice to members but also general advice to non-members and can help steer them to those most appropriate for their query so I encourage everybody to get in touch.

**John Haddon, UKIVA Technical Consultant, technical@ukiva.org
Director, Panther Vision Ltd**

MultiPix Imaging presents Technology Day 2012

'The Machine Vision Experience'

+44 (0)1730 233332
sales@multipix.com
multipix.com/techday2012



**Twickenham Stadium
21st June 2012**

- . Explore USB3.0 Vision
- . CoaXPress & HD-SDI
- . Introducing 10GigE Vision
- . Advances in 3D Imaging
- . Smart Sensor solutions

The next in a successive series of free technology days, this event is an exciting and innovative look at how machine vision is now an integral part of everyday life. Latest technology will be explained through the use of 'behind-the-scenes' case studies.

Delegates will also benefit from meeting the manufacturers, live product demonstrations, networking and enjoy a tour of Twickenham Stadium.

OEM's, Systems Integrators and End Users are all welcome to register.

MultiPix
imaging

Editorial material in this section is provided by UKIVA Members. The UK Industrial Vision Association does not take responsibility for the accuracy of any statements.

MULTIPIX

www.multipix.com

Multipix Announce the Latest PCIe Image Acquisition Boards

Multipix Imaging announce that Euresys are renewing the first products of the Pico series and are launching their new PCI Express versions of the popular PAL/NTSC image acquisition cards. The two new PCI Express cards are fully interchangeable with their PCI equivalents.

The first, the Pico PCIe acquires one or two composite or one S-Video video signals and is equipped with four TTL I/O lines and four video connectors: BNC, S-Video, DB9 and an internal 10-pin header. Its small PCB size is compliant with the low-profile format and the card is delivered with a low-profile and standard-profile bracket. This entry-level capture card is ideal for cost-sensitive single-camera applications in machine vision.



Network your Analogue Cameras

Your GigE Vision video network can now be expanded to include analogue cameras using the latest Pleora iPORT Analogue-Pro IP engine. The compact, simple to integrate iPORT Analogue-Pro IP engine allows for high-quality video from analogue cameras with low, predictable latency over Gigabit Ethernet (GigE). It can encode analogue to digital video from up to two analogue cameras simultaneously.

This video transmitter is ideal for system integrators looking to realise the benefits of networked video connectivity, whilst combining existing analogue cameras. Ideally suited for any application that requires a networked camera system and conforming to GigE Vision® and GenICam standards.



Extremely Thin Laser Lines from the ProPhotonix InViso Micro

The InViso Micro from ProPhotonix is the latest product from the InViso Laser range and is designed for applications requiring extremely thin laser lines. The InViso Micro achieves a line width of just 16µm at a working distance of 120mm.

InViso Micro, like the rest of the InViso range, incorporates a flat mounting surface with the output beam referenced to this surface which means the beam is automatically aligned on installation. This removes the need for lengthy and tedious adjustments to ensure precise beam alignment.

InViso laser modules offer additional advantages over existing lasers currently used in many machine vision applications. A unique external focus mechanism preserves factory set alignment & bore sight settings when adjusting the focus without the use of complex tools. Various optical configurations allow for a wide range of focus and beam shaping options. Both standard and custom configurations provide cost-effective solutions for any size or scope of business.



UWE Announce New MSc in Advanced Automation, Machine Vision & Management

A new MSc in Advanced Automation, Machine Vision & Management is being developed by the University of the West of England in Bristol. This MSc is specifically targeted to help fill a skills gap that has been identified in industries such as industrial vision.

The course will include a unique combination of increasingly overlapping and synergetic disciplines with a strong emphasis on hardware for solving 'real-world' problems and core business skills, and will benefit from direct ties with industry. In particular, the UKIVA committee, and members individually, will play an active role in formulating the course to maximise benefits to UKIVA members and industry.

Taught modules include Machine Vision, Electromechanical Systems Integration, Advanced Automation and Concurrent Engineering, Intelligent and Adaptive Systems and Robotic Fundamentals. There will be a range of case studies and a substantial industry led research project.

Further details from Prof. Melvyn Smith
Melvyn.Smith@uwe.ac.uk or
www.uwe.ac.uk/et/mvl

The PPMA Group Industry Awards 2012

The UKIVA has announced the first UK award for innovation in industrial vision for the 'Most Innovative Machine Vision Project'. The award is open to all vision equipment suppliers, system integrators or end users that have installed an innovative vision system between January 2011 and June 2012 (including non-members of the UKIVA).

For entry details see

<http://www.ppma.co.uk/industry-awards.html> or contact Grant Collier at the PPMA (grant.collier@ppma.co.uk). The Award is part of the PPMA Group of Associations Industry Awards and will be judged by a fully independent panel of industry specialists. The Awards Ceremony will take place in front of 400 industry leaders, press and government in Birmingham on the evening of Tuesday 25th September 2012 - the first night of the PPMA show.



Ultra Compact USB 3.0 Camera Available from Stemmer Imaging

STEMMER IMAGING can now offer ultra compact USB 3.0 cameras from the IDS uEye CP range and that measures just 29 x 29 x 29 mm. Featuring the USB 3.0 interface, the uEye CP benefits fully from the 9 year pedigree of IDS in the manufacture of USB-technology cameras. It has data transfer rates faster than GigE cameras and can be used at distances of more than 10 metres. Three sensors, ranging from VGA to 5 Megapixels are available.

The new USB 3.0 interface, also called SuperSpeed USB, offers high speed data transfer rates of 400 MegaByte/s. This is a tenfold increase in data transfer rate compared to USB 2.0 and around 4 times the speed of the GigE interface. Data transmission distances of more than 10 metres can be achieved using standard industrial cables. This makes these cameras ideally suited to a wide range of data rich applications.

The new camera has a host of useful features. A 12-bit lookup table and hardware gamma correction provide brightness control, while the 12-bit colour depth offers 16 times more detail compared to the usual 8-bit cameras. Hardware based data pre-processing is also provided as standard.

The camera is perfectly suited to industrial applications, with its mini USB 3.0 connector and light weight (less than 45g thanks to its magnesium housing). It offers trigger and flash as well as two General Purpose I/O, which can also be changed into a serial interface (RS232) for easy triggering or control of peripheral devices. Power is supplied via the USB bus so there is no need for an additional power cable.



New Embedded PC For Machine Vision Applications

The powerful fanless Adlink Matrix MXC-6000 Embedded-PC is now available from STEMMER IMAGING. The Intel® Core i7 2.0 GHz processor and Intel® QM57 chipset deliver a level of performance ideal for image and vision measurement and automation applications in areas as diverse as intelligent transport systems, factory control, test instrumentation, safety surveillance and building automation.



A rich I/O functionality includes two PCI slots or one PCI and one PCIe x4 slots, two Gigabit Ethernet ports and four external USB ports allowing the selection of the best possible camera for the application. Other I/O capabilities include one port for DVI-I (VGA + DVI-D), allowing the control of two independent displays and two RS232 ports plus two software-selectable RS232/422/485 ports.

All ports are mounted on the front panel for ease of use. An additional internal USB 2.0 port allows the deployment of license keys (dongles). 16 isolated I/Os support industrial controls and an eSATA port supports storage expansion or hot-swapping of SATA drives.

The fanless and innovative cable-free design provides excellent dependability in harsh environments, where severe temperature variation and vibration may exist. An optional hot-pluggable fan module is available to dissipate heat generated within the system should high power consumption PCI/PCIe cards be installed.

12 MPixel High Speed CameraLink Cameras

The new Falcon2 series of CameraLink cameras from Teledyne DALSA are now available from STEMMER IMAGING. The cameras have frame rates of up to 168 fps with 4 MPixel resolution for high speed imaging. A 12 MPixel resolution model offers a frame rate of 58 frames per second – the highest frame rate currently available at this resolution.

There are three GenICam compliant high performance models with the CameraLink interface and featuring the same improved-performance CMOS sensors used in Teledyne DALSA's Genie TS cameras. True global shuttering removes unwanted smear and time displacement image artifacts, making Falcon2 cameras ideally suited to applications where throughput, resolution and dynamic range matter. These include automated optical inspection for electronics manufacturing, semiconductor wafer inspection and flat panel display and solar panel inspection.

The Falcon2 series feature in-camera image pre-processing providing flat field correction. An extensive feature set includes programmable exposure time and frame rate via the CameraLink interface or by external hardware signals, and selectable aspect ratios (4:3 and 1:1). All three models are housed in a remarkably compact, rugged and thermally efficient body, so they need no external cooling system.



Machine Vision, which ever way you like it...



LIGHTING / CODE READING / ROBOT GUIDANCE / VISION SENSORS / VISION SYSTEMS / PC BASED VISION

FlexXpect Glue Bead | Pharma | Labelling

At Omron, we understand the requirements for machine vision solutions vary dramatically by application and personal preference. Our extensive portfolio of solutions range from cost effective vision sensors for simple inspection tasks, through to extreme performance vision systems operating the latest Intel I5 processors for more demanding applications. Through our FlexXpect software solutions, even specific applications or industry requirements are catered for, ensuring you have the flexibility to choose the best possible solution for your application. Weather you prefer an "out of the box" solution or the flexibility of a PC based package running networked cameras, With Omron the choice is yours.



Autofocus touch-screen video controller



SCORPION VISION

www.scorpiondivision.co.uk

New Autofocus Touch Video System

The Scorpion Vision Autofocus Touch Video System offers a quick and simple interface for monitoring live camera images. The touch-screen display allows the operator to monitor critical work and to make the finest autofocus adjustments with a single touch on the screen. The system is one result of the Scorpion Vision OEM strategy.

The system consists of a compact industrial camera equipped with an autofocus mechanism built in to the camera body, a heavy duty flexi-arm and a flat panel touchscreen PC. The camera is delivered with a selection of interchangeable wide-angle and telephoto lenses. The autofocus button makes the final adjustment to the image focus.

The camera is movable on the flexi-arm for a full 360 degrees around the subject, allowing for close up, and rear view shots. Multiple camera systems can optionally be operated from a single touch-screen.

Scorpion Vision Apps for Sony

Scorpion Vision Apps define a completely new entry level in Machine Vision and are especially designed for Smartcams from Sony. The Scorpion Vision SmartCam combination provides a genuine combination of power and value. Scorpion Vision Apps mean that any automation engineer can enjoy the benefits of an accurate machine vision solution at a cost where struggling with photo eyes and low cost sensors is a waste. Scorpion Vision guarantees that their customers will be happy with a SmartCam – they can try it without any commitment and if they don't like it they can return it free of charge.

Common features for Scorpion Vision Apps:

- Deployment with Scorpion SmartCam Installer
- Based on proven Scorpion Vision Framework
- Easy upgrades available from the Internet Repository
- Development with Scorpion SDK
- OEM Development upon request - we make the best 3D solution for our customers

OLMEC-UK

www.olmec-uk.com

Automotive Hose Inspection System Commissioned

A leading manufacturer of PTFE hose used in the automotive industry has integrated a vision inspection system designed by Olmec-UK Ltd into its extrusion line at its UK manufacturing facility. The vision system can continuously inspect hose travelling at speeds up to 6 metres/minute and is linked to a novel failure mechanism.

The vision system features 4 cameras arranged at 90° to each other with the tube travelling through the centre so that the entire outer surface of the tube can be imaged. This allows high-speed detection of flaws including foreign matter, cracks, burrs and blistering. It overcomes the limitations imposed by human inspection and pressure leak detection. It can inspect both virgin PTFE and carbon-lined hoses and different diameter tubes may be inspected without setup changes.

The system is fully integrated into the extrusion line control system and features a simple-to-use intuitive graphical interface. All defects are detected, whether cosmetic or likely to cause failure and identified accordingly. Defect location reports can be produced, or the tube automatically punctured at the defect point. The tube will then fail at the high pressure testing stage allowing the defective region to be cut out.



LEUZE ELECTRONICS

www.leuze.co.uk

Laser Line Range Sensor

Leuze Electronic's innovative Line Range Sensors use a laser line equivalent to a cascade of 376 sensors to detect presence and shape. Example applications include filling and overflow detection; presence checking of the correct number of products on a conveyor; machine infeed analyses.

The sensor is programmed on a PC, uses Boolean logic to monitor various aspects to decide which of four 24v outputs to switch. The sensor can be demonstrated and used within the first 30 minutes of coming out of the box, making it ideal for machine builders and end-user applications.

Leuze Electronic, the sensor people can help solve sensing, vision and safety applications and in this instance help machines see in the dark.

NATIONAL INSTRUMENTS

www.ni.com/uk

National Instruments Introduces New Vision and Motion Hardware with NI RIO Technology

National Instruments (Nasdaq: NATI) has introduced two new additions to its popular NI reconfigurable I/O (RIO) technology including a reconfigurable Camera Link frame grabber for demanding embedded vision applications and a motion module for the NI CompactRIO platform. The NI PCIe-1473R frame grabber is a PC-based embedded vision board that combines field-programmable gate array (FPGA) technology with a Camera Link interface to

continued on page 8

New UKIVA member

BAUMER VISION GROUP

Baumer is one of the leading global manufacturers of innovative image processing components and offers an extensive product range of high quality industrial cameras and vision sensors. Our clients profit from our many years of vision competence on an international level and our strong development capacities. Our core competence lies in all vision disciplines – from sensors to signal processing, from interfaces to drivers, to integrate the camera into the corresponding vision system. For further information, visit www.baumer.com



SUPERSPEED USB 3.0



See Point Grey's ground breaking
Flea3 USB 3.0 cameras
at www.clearviewimaging.co.uk



Flea3 USB 3.0 cameras, cards and drivers for reliable end-to-end imaging. www.clearviewimaging.co.uk



Sole distributor for POINT GREY in the UK

continued from page 7

help engineers create high-performance embedded imaging and inspection applications. The NI 9502 brushless servo drive C Series module makes it possible for engineers to drive brushless servo motors, including six new custom NI motor options, directly from the reconfigurable CompactRIO system to address advanced motion control challenges.

The NI PCIe-1473R frame grabber is ideal for advanced inspection and imaging applications that require image pre-processing and high-speed control such as medical imaging, web and surface inspection and high-speed sorting.

Readers can visit www.ni.com/vision to learn more about the NI PCIe-1473R frame grabber and www.ni.com/motion for the NI 9502 motion module and brushless DC motors.

Smart Camera Family Expanded with Seven New Models

NI has announced that it is expanding its NI Smart Camera family of products by introducing seven new models, including colour and high-resolution options. The new NI 177x Smart Cameras feature a 1.6 GHz Intel® Atom™ processor for increased processing power and an IP67 rating to protect the hardware from dust and water, making the cameras ideal for industrial inspection applications that require high-performance in a rugged form factor. Additionally, the cameras have a real-time operating system to deliver the reliability and determinism needed on a production floor.

Using the Intel Atom processor, the new cameras deliver processing speeds four times greater than other NI Smart Cameras. They also add new sensor options, including VGA, 1.3 MP and 2 MP in colour and monochrome and 5 MP in monochrome. The new sensor options make the cameras well suited for applications that require higher resolution image acquisition such as metrology and detection of small defects as well as colour imaging such as LED validation for electronics. Additionally, the strong mechanical housing, M12 connectors and lens cover have earned the NI 177x Smart Cameras an IP67 rating and are the first National Instruments products to offer an IP67 rating. See www.ni.com/smartcamera.

Sound and Vibration Measurement Suite 2011 Announced

The latest version of the NI Sound and Vibration Measurement Suite software has been announced. This provides a comprehensive collection of analysis and signal processing tools for noise, vibration and harshness (NVH) testing, machine condition monitoring (MCM) and audio test applications.

Engineers can use the suite as stand-alone software or combine it with NI hardware and NI LabVIEW™ system design software to greatly simplify test system development and control. With its new vibration data-logging functionality and other enhancements, the Sound and Vibration Measurement Suite 2011 helps engineers to more easily customise and automate any MCM or NVH test or monitoring application. See www.ni.com/soundandvibration.

SICK (UK)

www.sickivp.com

Compact SICK Laser Protection Ideal for Big Tasks!

SICK (UK) is launching the miniature TiM300 series laser scanner for a wide range of industrial automation, collision-protection and security duties where high performance detection must be combined with maximum reliability.

Although the rugged, metal-housed sensor is only tennis-ball sized, the SICK TiM300 is based on the same time-of-flight infra-red scanning technology as SICK's highly regarded LMS series of long range laser scanners. The TiM300 also has easy-to-use Zonal programming functionality via a USB port or on-sensor buttons, for accurate determination of protected areas.

The TiM300 has a range of up to four metres with a scanning angle of 270°, and can be configured for indication, warning and stopping fields. Its 2D scanning capability enables it to both protect and guide unmanned vehicles and overhead rail conveyors, even on curves. It will also provide presence detection, monitor pallets and load integrity in tight spaces and even guard displays where a discreet or hidden sensor is desirable.

As part of its advanced specification, the TiM300 is highly energy efficient; at only 3W, it uses half the power of comparable scanner sensors. This makes it ideal for battery powered and remote mounting where power drain must be controlled.



MEMBERS DIRECTORY

VISION TECHNOLOGY PROVIDERS

Active Silicon Ltd www.activesilicon.com T 01753 650600	Suppliers of leading edge vision technologies to OEM's, integrators and end users.
Alrad Imaging www.alrad.co.uk T 01635 30345	Alrad Imaging is a prime UK distributor of vision products. Products include cameras and sensors, frame grabbers, illumination, imaging software and sub system solutions for OEMs and system integrators.
Baumer Ltd www.baumer.com T 01793 783839	Baumer is one of the leading global manufacturers of innovative image processing components and offers an extensive product range of high quality industrial cameras and vision sensors.
ClearView Imaging Ltd www.clearviewimaging.co.uk T 0845 606 0457	ClearView Imaging is a supplier of vision components, including a wide range of cameras, frame grabbers, software, embedded systems, smart cameras, vision processors, lighting and optics.
Cognex UK Ltd www.cognex.co.uk T 01908 206000	Cognex is the world's leading vision company, with over 150,000 systems delivered. We offer a complete range of vision solutions, from smart cameras to powerful framegrabbers.
Flir Systems Ltd www.flir.com T 01732 220011	FLIR Systems has been at the forefront of industrial thermal imaging for more than 30 years and is now the technology's world leader. Recent acquisitions have significantly widened its technology base.
Framos Electronics Ltd. www.framos.co.uk T 01276 404 140	Framos is a specialist distributor of digital and electronic imaging devices and complete cameras. Both area and linear CCD and CMOS devices are offered with full technical support for design and integration.
Imperx Incorporated www.imperx.com T +1 561 989 0006	Imperx, Inc. was founded in 2001 by a seasoned team of senior executives with a proven track record in developing advanced digital imaging products. Imperx designs, develops and manufactures state-of-the-art imaging products for a variety of markets.
Lambda Photometrics Ltd. www.lambdaphoto.co.uk T 01582 764334	Lambda Photometrics distributes a broad range of machine vision products. These include fibre & LED lighting, lens systems, cameras (CCD, linescan, smart CMOS), framegrabbers & software.
Leuze electronic Ltd www.leuze.co.uk T 01480 408508	Leuze electronic 'the sensor people' are the experts for sensors. They also specialise in smart cameras and identification products.
Matrox Imaging www.matrox.com/imaging T 01895 827280	Matrox Imaging is a leading designer & manufacturer of PC-based hardware & software for machine vision, image analysis & medical imaging drawing on an unparalleled 25 years of industry experience.
Multipix Imaging Ltd. www.multipix.com T 01730 233332	The wide range of products offered includes frame grabbers, cameras, lenses & imaging software together with a highly experienced support service.
National Instruments UK Ltd. www.ni.com/uk T 01635 523545	National Instruments manufactures hundreds of integrated software & hardware products, which are used to replace &/or communicate with traditional instrumentation.
Omron Electronics (UK) Ltd www.omron.co.uk T 01908 258 258	Omron Electronics manufactures a wide range of vision-based industrial solutions, ranging from cost effective vision sensor products to high-end vision controller and camera products.
PCS Industries www.pcs-industries.co.uk T 01268 733515	PCS Industries is an independent automated solutions provider offering specialist machine vision and coding & marking solutions.
Scorpion Vision Ltd www.scorpionvision.co.uk T 01590 679 333	Scorpion Vision Ltd is the UK representative of Tordivel AS of Norway. Founded in January 2006, the company has the remit to promote, advise and manage sales and support of Scorpion Vision Software.
SICK IVP AB www.sick.co.uk www.sickivp.com T +46 13 36 21 00 01727 831121	IVP offers cameras for high-speed 3D machine vision for OEMs and vision integrators. IVP's 3D technology can replace or complement traditional 2D inspection. The outstanding performance is a result of a proprietary CMOS sensor technology.
Stemmer Imaging www.stemmer-imaging.co.uk T 01252 780000	The premier UK machine vision components distributor providing leading vision technology, advice and development services to OEMs, integrators and corporate customers.
Vision & Control GmbH www.vision-control.com T +49 3681 7974 - 0	Vision Control produces a comprehensive system of precise components suitable for industrial machine vision. This includes our PICTOR smart cameras, VICOTAR range of lenses and VICOLLUX range of illuminations.

VISION SYSTEM INTEGRATORS & CONSULTANTS

Astech Projects Limited www.astechprojects.com T 01928 571797	Astech Projects are Vision System Integrators that specialise in the custom design, build & systems integration of advanced robotics and automation applications
Creative Automation Solutions www.creativeautomation.co.uk T +44 (0) 7812 766639	CAS Ltd provides a full range of services to support both suppliers and users of automation.
FS Systems LLP www.fssystemss.co.uk T 01933 625162	FS Systems is a UK specialist in machine vision. Our product range covers, Vision & Control machine vision components, and GenVis and RoboVis PC-based vision systems and vision training.
Loop Technology Ltd www.looptechnology.com T 01305 257108	Loop Technology Ltd provides development and integration services for automated processes involving machine vision systems and/or motion control systems. They produce automation systems for the electronics, automotive, printing and packaging industries.
OLMEC UK Ltd www.olmec-uk.com T 01652 631960	Olmec supply, install and integrate vision systems into existing, new and OEM machinery processes.
Panther Vision Ltd www.panther-vision.co.uk T 01252 713285	Panther Vision provides independent consultancy and bespoke product development and is interested in joint development opportunities.
RNA Automation Ltd www.rnaautomation.com T 0121 749 2566	RNA are specialists in the supply of parts handling and orientation equipment, including vision systems and pick and place handling units.

PROVIDERS OF SOLUTIONS THAT UTILISE MACHINE VISION

Multivac UK www.multivac.co.uk T 01793 42580	Multivac UK is a wholly-owned subsidiary of Multivac Sepp Hagenmüller GmbH & Co, the world's leading supplier of packaging machines.
Stein Solutions Ltd T 07787 568307	Stein Solutions provide inspection and optical sorters.
UPM Conveyors www.upmconveyors.co.uk T 01753 548801	UPM Conveyors provide complete automated conveyor & vision systems

RNA AUTOMATION

www.rnaautomation.com

Vision Guided Robot makes Plumbing Parts

RNA Automation has a vision guided robot that is used in the production of plumbing parts. Components are presented to the robot by an RNA bowl feeder that feed parts onto a pick conveyor mounted below a Robot Vision System.

The vision system can 'see' and identify the position and rotation of the parts and the robot picks directly from the conveyor. Components that are lying in a difficult position or on top of each other are recycled back onto the conveyor. The vision robot utilizes two elements of tooling:

- a single vacuum cup that picks single parts from the conveyor and places them into a 'multi cavity nest'.
- a multi cavity nest fitted with an umbilical tool changer designed for quick changeover. The unit was also designed for multiple configurations of nests and different component sizes and shapes.

The part nest was mirrored on both sides and fitted with vacuum cups to hold the product in place. During the robots first pass the cell formed fittings are picked from the press tooling and dropped onto an out-feed conveyor out of the cell. The robot rotates the nest 180 degrees, re-enters the press and places the raw parts into the empty tooling cavities. The cycle repeats.

A key advantage of the system is that the vision software is completely embedded in the robot controller and this means that there are fewer parts and no interface issues and this leads to higher reliability.



Plumbing parts on a Bowl Feeder below the vision guided robot

COGNEX

www.cognex.co.uk

Cognex Assures Product Traceability through Advanced 2D Code Reading

Stringent legislation in the pharmaceutical industry is designed to combat counterfeit goods by ensuring each product can be traced throughout the supply chain. To achieve the required levels of traceability, manufacturers are increasingly reliant on printed 2D codes combined with advanced code reading technology.

Avanco is a major international integrator of Item Level Serialization and Tracking Solutions and works together with some of the world's largest pharmaceutical manufacturers to install Automatic Identification systems throughout the complete supply chain to ensure product traceability. As fulfilment of the second phase regulation of the Drug Tracking System and the Packaging Tracking System as defined by the Ministry of Health of Turkey, Avanco recently installed a complete traceability solution for one of its key global manufacturers.

The Turkish facility manufactures and distributes over 60 million medicine boxes each year. Accurate and reliable code reading are essential to achieve the required levels of traceability. A requirement to be able to read multiple codes within one field of view and any potentially blurred or distorted codes were challenging application requirements.

Designed as a pre-shipment product traceability solution, Avanco had developed an Optical Box™, comprising a Cognex In-Sight ID Reader and an innovative light distribution system to provide the most suitable environment for multiple code reading. Extensive research and testing had been carried out to analyse various code reading technology options involving both Cognex ID Readers and other manufacturers' products. The results concluded that Cognex was the only company to provide suitable ID Readers with the advanced vision technology capable of consistently reading both multiple codes within one field of view and distorted or blurred codes.

Avanco's workstation including the Optical Box was installed at the customer's manufacturing facility and further testing carried out across the range of products to ensure the solution could maintain high read rates regardless of changes to product size or shape. Following a successful trial period, ten workstations with Optical Boxes were integrated.



Sample pillbox's for analyses

continued on page 12

APPLICATION ARTICLES

continued from page 11

Each medicine box has a 2D Data Matrix code printed onto the surface using an inkjet printer. The boxes are then shrink wrapped in batches of up to 25 and placed manually into the Optical Box. In just 1.4 seconds, the Cognex In-Sight 5615 ID reader decodes all 2D codes, the information is processed by Advanco's ARC software and is displayed for the operator. Any defective products trigger an alarm and are removed. This procedure not only ensures all packages ready for shipment are fully traceable, but also leads to improved production processes for both code marking and wrapping operations as any defects can be addressed immediately.

PANTHER VISION

www.panther-vision.co.uk

Quadriplegics can See to Help Themselves -

Panther Vision develops innovative gaze tracker to improve quality of life for the severely disabled

The severely disabled and in particular quadriplegics frequently have difficulty communicating with carers and would love to be able to do simple things for themselves. Like changing a music channel, increasing the volume or asking for a drink. In 2010 Panther Vision was approached by an SME which had developed specialist software which enabled quadriplegics to interact with a computer using solely their eyes and a monitor split into upto 12 cells. Although the ability to track a users gaze using a camera is reasonably well established technology, current systems often require a lot of tuning, are very expensive and frequently failed for the SMEs clients.

Reliability, robustness, flexibility, easy customizability, low cost, compactness and light weight and the ability to work anywhere were all critical. Panther Vision has spent the last 2 years using 30 years computer vision expertise to develop a new Gaze Tracking system that will meet all these requirements. The system is now undergoing first level technical assessment before being integrated into the SMEs client systems. Initial tests have suggested that in some areas it is already performing significantly better than current 'off-the-shelf' competitor systems.

There were a lot of technically conflicting requirements and one of the toughest was to be able to work with low cost hardware and a large field of view – because the user cannot position themselves in the field of view! The system uses small near infrared illuminators and a USB camera to image the users face. The figure shows a typical image with a large field of view and a detailed image of one of the eyes. It is the relative position of the illuminators compared to the centre of the pupil that provides information about the gaze position.

The prototype system runs at between 40hz and 100hz on a decent spec'd computer using low cost hardware and can achieve a surprisingly high accuracy. Panther Vision believes that there are a lot of applications that would benefit from low cost, reliable and accurate Gaze Trackers and is currently looking for additional customers and partners to focus commercial development into key markets. If you have a potential application then please contact John Haddon at Panther Vision (01252 713285, jf.haddon@panther-vision.co.uk).

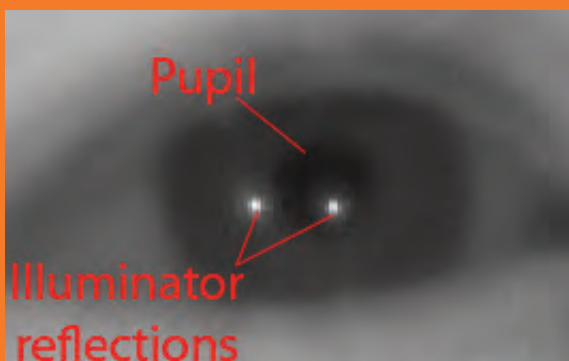
BAUMER

www.baumer.com

Eyes Right – Wavefront Analysis with Baumer Cameras

Vision impairments can afflict anybody, usually with far-reaching consequences. Two familiar defects of the human eye known as spherical and cylindrical aberrations can be compensated with spectacles and contact lenses. Human vision can also be impaired by optical defects of a higher order, the so-called wavefront aberrations. An appropriate diagnosis is an essential prerequisite for corrective treatment.

Asymmetrical light refractions and spherical aberrations of the eye can be diagnosed using wavefront analysis. This involves measuring the aberration of



Images showing the full field of view and a detailed portion around the eye with the illuminator reflections. The processing must accurately determine the relative position of the illuminators compared to the centre of the pupil



the patient's eye from ideal optical conditions and depicting it in a color-coded wavefront chart. In the diagnostic instruments, the widely used Hartmann-Shack method is increasingly competing with camera-based systems employing the Tscherning principle. Either system can produce a wavefront chart of the entire eye and a chart showing aberrations of just the cornea. Such charts can be used to calculate an exact laser ablation profile of every part of the cornea for laser operations.

The TXG-series cameras from Baumer provide excellent image quality and performance suitable for integration into diagnostic instruments based on both the Hartmann-Shack and Tscherning principle. This enables a reliable diagnosis of vision defects as an optimal preparation for laser treatment.



For information
about courses and job vacancies
look on the relevant pages at

www.ukiva.org

OLMEC

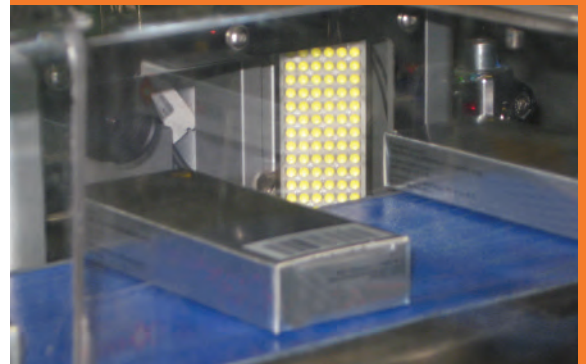
www.olmec-uk.com

Olmec Implements an Innovative Healthcare Carton Code Inspection System

Since January 1st 2011 all pharmaceutical products distributed in France are required to conform to French CIP13. This means they must have an ECC200 Data Matrix barcode that incorporates the CIP13 code, a batch number, expiration date and human readable text.

Olmec-UK, a leading vision systems integrator in the healthcare, food and pharmaceutical sectors, has successfully implemented a custom designed high speed in-line code reading system to meet the track and trace code reading requirements. The system, fully integrated into the control system at a leading healthcare manufacturer, provides 100% reading and verification of codes on cartons and can read up to 1200 cartons/min.

continued on page 14



A new generation of PoE GigE Vision Cameras

STARTING AT JUST £310

- Up to 150 fps
- Small and lightweight
- Low power and cool running
- Excellent supporting software and drivers

Available now from
www.smallpoecamera.co.uk



 **SCORPION**
VISION LIMITED

Efford Park | Milford Road | Lymington | Hampshire | SO41 0JD
Tel: +44 (0)1590 679333 Fax: +44 (0)870 622 4092

www.scorpionvision.co.uk

Machine Vision Software, Systems, Cameras and Components

 **THE IMAGINGSOURCE**
TECHNOLOGY BASED ON STANDARDS

APPLICATION ARTICLES



Look for UKIVA and several of its members on Twitter.
<http://twitter.com/ukiva>

continued from page 13

The vision system reads the 2D code and text that is printed onto the carton as it leaves the cartoning machine. The 2D code is also verified according to 7 parameters of ISO 15415. Cartons are automatically rejected if the 2D code is unreadable or missing, or if the text is missing or incorrect. The system provides batch reporting including statistics on the quantity of cartons manufactured and the quantity rejected. In addition, individual carton print codes can be checked and the data printed.

Full integration into the production line control system was critical to ensure that no cartons were missed. Olmec undertook a detailed analysis of the existing control system functions including triggering and reject reconciliation as well as the failure mode of all sensors to ensure a seamless integration of the code reading system. Installation and commissioning of the system was supported with a comprehensive documentation package.

STEMMER IMAGING

www.stemmer-imaging.co.uk

Stemmer Technology Integrated within Variable Data Verification System

High speed image processing techniques and verification are well-established and can be used to check text, 1D bar-codes, 2D datamatrix codes individually or in various combinations. In general, the data being checked on any individual batch does not change – each label, or product within the batch contains the same information. However there are many applications, such as bank notes, cheques, lottery tickets, software security labels, mail out documents and other 'content critical' items where the data changes from label to label. Whether this is a sequential or non-sequential change, it represents a significant challenge to the image processing system.


As in more traditional applications, variable data verification systems must ensure product integrity and eliminate the production of expensive waste. The system must provide 100% inspection by reading and verifying label numbering in real time and provide a guarantee of print quality by rejecting units with incorrectly printed characters.

Verification Systems Ltd has developed a high performance, multiple-stream inspection system (H.S.N.V.S) using cameras, lenses, framegrabbers etc supplied by STEMMER IMAGING. It has multiple high speed triggered cameras (one per stream) that capture images from the moving document. Printed data is decoded and checked for correct quality and placement.

Custom-designed software developed for this product uses high speed pattern recognition modules designed specifically for alignment, optical character recognition (OCR) and verification from STEMMER IMAGING's Common Vision Blox imaging toolkit. The OCR software allows the training and recognition of objects of all shapes. The system can be taught to read all standard fonts as well as barcodes and symbols. It can also be easily trained to use new or non-standard fonts.

A variety of calculations can be required for variable data verification. These include verification of the correction sequencing between serial numbers and validation of the correct layout, both within a single unit and within a sheet of multiple units. Other requirements may be to check for OCR quality, OCR/symbol print contrast for over and under inking trends; and alignment. The high speed triggered camera(s) capture images and record data from multiple fields for this analysis.





PLAN TO VISIT
The UK's Premier Event
for Vision & Imaging



WEDNESDAY 17 & THURSDAY 18 OCTOBER 2012
RICOH ARENA · COVENTRY

PHOTONEX[®]

- Learn how vision can save you money
- See the latest innovations
- Get connected!

SUPPORTED BY  FIND US ON   

Great Show!
Easy Access Venue
Well Attended
UKIVA Presentations

www.photonex.org/UK_vision.html
+44 1372 750555

Announcing 'The Machine Vision Experience' Technology Day

The Machine Vision Experience is an exciting and innovative look at how machine vision is now an integral part of everyday life. Latest technology will be explained through the use of case studies that take a look 'behind-the-scenes', with many industries being incorporated such as, electronics, automotive, food and beverage, broadcast, sports analysis, and medical.

Multipix has a proven track record of hosting successful technology days that are informative, fun and free with an emphasis on education. On 21st June 2012, the next day in a successive series will cover technologies including USB3 Vision, Coaxpress, HDSOI, 10GigeVision, smart sensors and the unique capabilities of HALCON image processing software.

The venue, Twickenham Stadium, is the perfect setting for a technology day that will be attended by world leading manufacturers. Basler, Datalogic, IO Industries, MVTec, Pleora Technologies and ProPhotonix will each provide a professional presentation on the diverse aspects of machine vision. Delegates will finish the day with an exclusive tour of the Twickenham historic site.

www.multipix.com sales@multipix.com
tel: 01730 233332

Machine Vision specialists, MultiPix Imaging celebrate 15 years in the industry

Multipix Imaging was formed in 1997 as a distributor of machine vision components, at a time when PC technology was developing rapidly. Now in 2012 we celebrate 15 years of vision excellence during which time Multipix has gained a reputation for superior service and support. Multipix remains a privately owned company with the commitment to educate and support the machine vision industry.

As from day one, the aim is to improve the UK's productivity and efficiency with the use of vision, whilst simultaneously promoting innovation.

Multipix offers a complete range of industrial vision components for today's demanding applications and highly experienced support to ensure our customers achieve exceptional results. This includes cameras with latest digital camera interfaces like GigE Vision and USB 3.0 which are very affordable and highly supportable; CameraLink and Coaxpress cameras offering very high resolution combined with very high frame rates. There are also cost effective frame grabbers that ensure data integrity to PC memory where image processing libraries are used to create powerful 2D and 3D vision solution. Smart cameras to complex PC solutions, Multipix are here to supply and support.

With ISO9001 accreditation, part of the ongoing commitment is that the management continually reviews procedures, ensuring development of skills and maintaining standards to achieve operational excellence that benefits both Multipix Imaging and our customers.

Looking to a successful future, as the technology continues to evolve there is one constant throughout; it is that Multipix Imaging remains committed to understanding both emerging trends and the integration issues that will be faced by our customer.

MultiPix
imaging



Key to markets Messe Stuttgart 

25

Find the difference

YEARS of VISION

 **One VISION**
The world's leading trade fair for machine vision

VISION
25th International Trade Fair for Machine Vision

6 - 8 November 2012 Messe Stuttgart
www.vision-fair.de

TECHNICAL TIPS

Some useful technical tips from UKIVA members:

Introduction to FPGA acceleration (STEMMER IMAGING)

This technical tip explains Field Programmable Gate Arrays (FPGAs), where they are used in machine vision and looks at the processing speed benefits they have to offer.

www.stemmer-imaging.co.uk/en/technical+tips/4299-Introduction-to-FPGA-acceleration

CMOS Sensors: What's the difference between global and rolling shutters? (Scorpion Vision)

This technical tip explains how global and rolling shutters work and the visual effects that they have when capturing moving images.

<http://scorpionvision.co.uk/FAQRetrieve.aspx?ID=37060>

The advantages of using LEDs in machine vision lighting systems (Alrad Imaging)

This looks at the benefits offered by LEDs including power consumption, stability, lifetime and cost.

http://www.alrad.co.uk/imaging/FAQ-LED_%20lighting_machine_vision.html

For more Technical tips or to have your questions answered contact our Technical Consultant: Dr John Haddon: technical@ukiva.org or visit our website: www.ukiva.org



For information about courses and job vacancies look on the relevant pages at

www.ukiva.org

www.ukiva.org

MISCELLANEOUS

RNA join 'Made in the Midlands'



CHAMPIONING
MANUFACTURING
IN THE MIDLANDS

RNA are pleased to announce that we have joined Made in the Midlands. The group's aim is to promote manufacturing in the West Midlands, focusing on getting firms to collaborate, communicate and source and supply from one another. RNA are proud to be a part of this organisation, which currently has over 200 members and is constantly growing. Our aim is to work with MITM and its effective marketing support service to source and supply more within the Midlands area.

www.madeinthemidlands.com

RNA Automation Ltd
www.rnaautomation.com

Scorpion Vision Software® 2D & 3D Training Course London Heathrow, April 24 - 26, 2012



SCORPION
VISION SOFTWARE®

Fly in to the best machine vision training and learn from the experts behind Scorpion Vision Software®. The course is based on the new Scorpion Vision Software® release 9 including Stereo Vision and 3D Robot Vision. The course starts with a Scorpion basic introduction, continues with advanced 2D vision tasks and brings you further through 3D vision solutions and the content of the new Scorpion 3D Stinger™.

Call: +44 (0) 1590 679333

Or visit: www.scorpionvision.co.uk/BookingRetrieve

ALRAD - Industrial Linescan Cameras for Machine Vision applications

We offer a variety of Linescan Cameras from 512 pixel low cost 8 bit to 16 megapixel 12 bit and a choice of speed and interface, from some of the world's premier manufacturers: e2v technologies, Imaging Solutions Group, SenTech and TVI Vision.



Applications include inspection of:

- Continuous sheet products
- Flat panel displays
- Solar cells
- PCBs
- Banknotes and stamps
- Newsprint
- Fruits and grains
- Traction rails

We also supply all the required lenses - grabbers - lighting - cabling

ALRAD
IMAGING

Call: 01635 30345
Email: imaging@alrad.co.uk
Web: www.alrad.co.uk