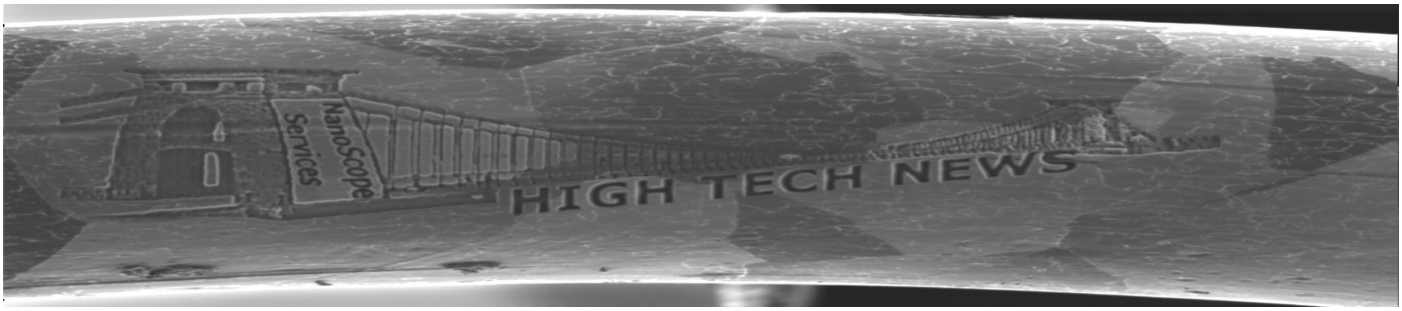


A new look

Welcome to the new look for the newsletter from the High Tech Sector group of the West of England LEP. The 16 page newsletter brings together the activities and events across the region, coupled with comment and useful information:

Venturefest returns, this time to the PassengerShed at Temple Meads. This will bring together the innovation, technology and finance community across all the sectors in the region with sponsorship from Airbus. More information on the activities at this key event on 9th June is on page 2.

Bristol is Open is a key programme in the region that will have a dramatic effect on the development of technologies for the Internet of Things, digital health and Smart Cities, as well as embedded software and high performance computing. The details of the programme are on page 9 & 10 and companies and individuals interested in getting involved can do so through High Tech Bristol & Bath (details on page 12)

Quantum technologies are also becoming a significant capability for the cluster. Page 8 & 9 show the UK quantum roadmap and highlights the strength of the quantum research activities here in Bristol and Bath.

Part of the new look with more photography and longer interviews and technology stories (and more pages) is driven by the availability of a new online library that brings together pictures and resources that can be easily used. Contributions to nick@flaherty.co.uk are welcome from individuals and companies.

Have you ever said that there must be a better way to do things in Bristol & Bath? The High Tech Sector group is looking to recruit new members from hardware, software and systems to its board to advise the Local Enterprise Partnership on technology strategy in the region and highlight the activities of one of the strongest technology clusters in the world. The board also acts as the advisory group for the Microelectronics iNet and High Tech Bristol & Bath and meets every two months. Contact mike@testandverification.com or nick@flaherty.co.uk if you are interested - it's a very good way of getting more connected into regional activities.

In this issue

April 2015

The High Tech News banner remains as an example of the expertise in the region. It was developed by Nanoscope Services in Bristol which milled an image of the Clifton Suspension bridge just 8µm long onto the bond wire of a chip. The image was also proposed as one of the new designs for the Bristol Pound note highlighting the innovation in the region.
www.nanoscopeservices.com

Venturefest Bristol & Bath returns

The VentureFest Bristol & Bath technology festival returns to Bristol to celebrate the region's position as a global centre for innovation, this time using the PassengerShed by Temple Meads.

Venturefest Bristol and Bath 2015 will take place on the **9th June at the Passenger Shed and Engine Shed in Bristol.** The new-look event will showcase the unrivalled innovation and investment opportunities in Bristol and Bath, which in February was named the largest digital cluster in the UK outside of London.

Venturefest enables entrepreneurs and innovators at all stages of the business lifecycle to connect with investors and thought leaders. Those attending will benefit from access to established global companies, investors, academic inventors and some of the region's most innovative and enterprising businesses. The event will also have a particular focus on the role of innovation in sustainability and green technology as Bristol celebrates its year as European Green Capital.

After taking a break last year, this year's event is being organised by the Venturefest Bristol & Bath Partnership which includes Invest Bristol & Bath, Bristol 2015, Business West and the Venturefest Network. Bristol & Bath has developed a global reputation as an innovation hotspot which was recognised last year in an international report from McKinsey & Co and Centre of Cities which revealed that the region is the only fast-growing globally significant technology cluster in the UK.

"As a world centre for innovation we're really excited to have the opportunity to bring together Bristol and Bath's leading businesses, entrepreneurs and thought leaders and showcase their cutting-edge thinking and approach to investors from across the region, country and from around the world. In Bristol's year as European Green Capital, Venturefest will also showcase the best green technology innovations from Europe and highlight the environmental contribution made by the West of England," said Andrew Garrard, who as Chairman of Bristol 2015 is responsible for the Green capital events programme.

Venturefest will have four main elements. The main exhibition space will be an innovation showcase of the region's most successful sectors: advanced engineering; high tech, ICT and microelectronics; digital and creative; and city innovation. There will also be an Investor Showcase, supported by SETsquared, TechSPARK, Invest Bristol & Bath and KPMG; plus a Start-up Village presenting some of the region's most exciting young innovations. Finally, a Thought Leadership Conference will highlight the latest developments on key issues affecting innovators and investors.

An aerospace pavilion will be sponsored by Airbus, which at Filton employs the largest number of engineers under one roof in Europe. "We are really excited to be championing Bristol and Bath's status as a world centre for innovation through Venturefest. Innovation is at the heart of our business so being a part of something that celebrates entrepreneurs and innovators is really important to us," said Katherine Bennett, Director of Communications and Government Affairs at Airbus.

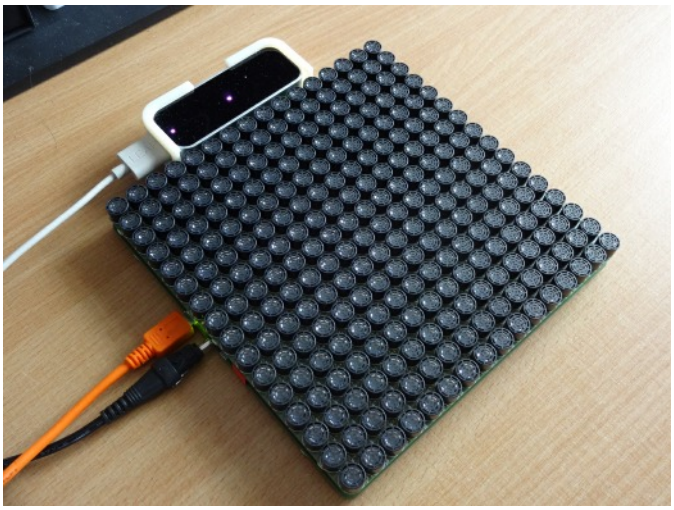
www.venturefestbristolandbath.com.

The magic of touch

It's not often a Bristol technology startup captures the imagination around the world, but that's what happened with Ultrahaptics earlier this year. Demonstrations at the CES show in Las Vegas of the technology developed at the University of Bristol led to a deluge of stories all around the world.

The excitement comes from the demonstration of ultrasonic sound waves that allow you to feel sensations in space. The initial areas that have captured the most interest - consumer, computer and automotive – are surprising, says Steve Cliffe, recently appointed CEO. "I thought it would be gaming but that's coming through more slowly mainly because the games companies update the platforms more slowly than consumer or even automotive," he said. "Most cycles are seven to eight years for big platforms." As a result the company is already selling development systems with a view to licensing the technology to a range of different industries.

The technology uses the focused ultrasonic waves to provide feedback for gesture recognition systems which can use all kinds of different sensors, says Cliffe. "We use a Leap Motion device in our demo – we need a recognition system to determine where your hand is to focus the ultrasonics and other sensor systems are available such as Intel's RealSense camera. The technology we've got is being able to create feeling in mid air, we are not a gesture company or a virtual reality (VR) company."



Ultrahaptic's prototype array of ultrasonic speakers generates sound waves that you can feel in free space

It is the precision timing between the different speakers that ensures all the soundwaves hit your hand at the same point at the same time and create pressure on your hand, he says. The current demonstrator uses standard ultrasonic parking sensors that operate with ultrasound at 40KHz. These are switched at 200Hz to gently vibrate the skin.

"We control the entire space – so if we put am 8mm point on your hand it can follow your hand around that space," said Cliffe. This has been attractive to the car makers who want drivers to be able to control the dashboard more easily wherever their hand is. This 8mm point size comes from the 40kHz wavelength. "40KHz is a 8.5mm wavelength but the focal point is infinite because it's the timing – the blob is 8.5mm across. To take it to 4mm you double the frequency," he said. "When we started, parking sensors are 40khz and the most widely manufactured ultrasonic emitter, but now there are surface mount versions and we are now characterising for mobile operation and understand the polarity so that we know how to change the algorithms to cope with the differences. We have an R&D programme looking at 4mm but it's not a focus right now – if you make it smaller, we need to understand the resolution of the nerves – if you make it smaller, does it feel smaller?" he said.

The demo system has a range of about 1m to show the kind of applications that are possible, which was shown at the Consumer Electronic Show in Las Vegas in January. "Even at a meter we can target finger tips with different feelings – soft and squidy, or harder, so very low frequency feel like raindrops, the higher frequencies feel more spongy – it's not about the technology but how it interacts with your hand," he said.

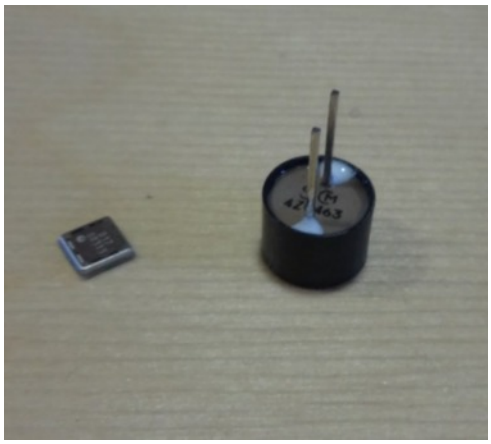
The automotive industry has been working on gesture for some time to avoid having to take your eyes off the road, but the problem is there's no feedback – so the way the Ultrahaptics technology helps is you put your hand out and it tells you if you are engaged, and this feeling can be different for each control or even for different people.

"In the car you can tell the difference between a left hand and a right hand so you know if it's the passenger or the driver, and interestingly and if you have a split screen it knows which person is giving the input," he said.

The car makers are all going different routes with gesture technology so it has to be completely independent, he says, and this this fits with business model the company has adopted. "We are licensing technology as we are not a Tier one supplier and have no ambition to be such – we will get to a solution with the car makers' Tier One suppliers," he said.

But automotive designs traditionally take a long time to come to market, so Cliffe is looking at other opportunities. "We are supporting a number of activities in the computer space," he said. "Keyboards and mice are not the way the human body was designed to interact with anything, so we can create mid-air keyboards for example. Then for top end consumer designs such as sound systems for volume – we have simulations operating up to 2m with the same accuracy of 8mm, so you could control your music from a side pod on a table," he said.

"White goods is interesting," he added. "Firstly we can create a force field, a barrier where you feel your hand go through as a warning for stoves or pieces of machinery. Or you can use it to control kitchen mixers etc with sticky hands, and even use it as a light switch with a simple sonar sensor."



Moving to surface mount sensors (left) dramatically reduces the size of the array for production

Ultrahaptics is looking at a licensing model for its technology. "Our product is software," says Cliffe. "We are licensing software which includes a patent license as well as a software license." As part of this, the company is offering a custom development services with NRE (non recurring engineering costs). "That's the phase we are moving into – we have done one already and negotiating a second one," he said. But he acknowledges that this is a consultancy model and inherently unscalable so the next step is to move to an embedded firmware solution.

"That is creating three different levels from simple to complex, encrypting the firmware and embedded it in a microprocessor. To use it, you give the X,Y coordinates, so you can write your own applications and use in your own products," he said. "We have spoken some well known microprocessor manufacturers and they are interested." These controllers would have specific part numbers to allow the number of licenses to be tracked, overcoming a notoriously difficult problem for licensing. "The software will be encrypted and embedded so we know how many are sold and shipped as we control the supply of the micros," he said.

A key element here is the performance of the processor and the algorithm to determine the cost of the overall solution. "When we started three years ago, the fastest graphics card available took 20 minutes to render one frame – now we can do 120,000 frames per second on 4% of a laptop's performance," said Cliffe. "The fundamental thing about improving the algorithms is dramatically reducing the processing performance and power consumption and so that we can do it on a low cost microcontroller." All of this will lead a series of reference designs of simple switches and dials that can be easily adopted by consumer equipment makers.

Partly as a result of the enthusiasm after the CES demonstration, the company already has a revenue stream from its development systems. "We are selling the evaluation boards for $20,000 and we have sold out – we are building another batch right now and these are made locally."

The company has raised $2m from the IP Group and founders and has tripled in size in the last six months to a team of 12, most under 30, recruited internationally, with a new chairman with experience of building companies. The next stage is the Series A round of funding. Will they look at venture capital? "We haven't made that decision yet but probably," he said. "We have a number of potential exit points – you look at a system and the component part and if we achieve our numbers and get it into laptops and automotive creates value for our investors."

The future is not yet mapped out, says Cliffe, but the aim is very definitely to create a significant technology development and licensing company.

www.ultrahaptics.com

The Year ahead - 2015

April - Bristol is Open takes off with a terabit network capability and the High Performance Computing SIG meets. The Education and Skills SIG meets on April 16th www.hbb.org.uk

May sees 30th anniversary of the Inmos Transputer and the health tech SIG meeting as well as the Festival of Ideas with sessions on Artificial Intelligence and Information theory www.ideasfestival.co.uk

June - Venturefest 2015 highlights all the innovation in the region from Brunel's PassengerShed with Startup Village and Investor Showcase

July - Qualcomm's takeover of CSR expected to complete

September - the Multicore Challenge Conference brings the world's leading processor researches and developers to Bristol

November - the Advanced Engineering show at the NEC in Birmingham covers flexible electronics and 3D printing

December - Bristol hands over as Green Capital to Ljubljana, capital of Slovenia

EngineShed delivers £8m in first year

A recently commissioned study has found that the Engine Shed, home to the Bristol SETsquared university business incubator and Invest Bristol and Bath, the West of England's inward investment service, has already added £8m to the local economy after being in operation for just over a year. The business hub, located in Brunel's original Temple Meads station building, generated just over £7m of net GVA growth in its first year. The refurbishment works prior to its opening in December 2013 – taking just 6 months – added a further £800,000 to this figure.

The study by Zeta Economics, a Bristol-based economics consultancy, found that the Engine Shed also supported the creation of 115 new jobs in the Bristol and West of England area since opening. The project, brought forward in partnership by Bristol City Council and the University of Bristol, has also provided business accommodation for over 300 people since December 2013. Businesses have used the Engine Shed have used it as a launch pad for growth, and several have since moved out and taken up larger premises in the city.

Zeta Economics' study has also found its Bristol base to be one of the most efficient, incubating more companies per staff member than the European average. SETsquared has supported 37 businesses whilst in its new home, and Engine Shed has accommodated 59, including 2 public sector organisations."Here is clear evidence that Engine Shed is powering economic growth in Bristol and the West of England. We have an efficient model here, and coupled with demand outstripping supply for space in the building, it gives us great confidence for the viability of plans to extend the concept by a further phase," said Nick Sturge, Director of the Engine Shed.

The report has shown the location in particular is important - 77% of companies have been influenced by this in their decision on where to have their meetings. One lounge member said "I've had several encounters…that could turn out to be useful investors or contacts. It's usually because other people are meeting and then you get introduced or recognise someone from LinkedIn."

The aim of the new Enterprise Zone around Temple Meads station is to create 17,000 new jobs in total and bring 400 new companies to the city over the next two decades – and the Engine Shed is a key part of that.

www.engine-shed.co.uk

High Tech Export Controls are changing

Export controls are still a key consideration for technology companies in the region particularly for security and cryptography products. Emily Jones and Rachel Dowle at Osborne Clarke in Bristol look at recent changes to European rules

International export sanctions and embargoes have featured heavily in the media over last six months. With sanctions against Russia and the international strategy for combating terrorist financing in Syria and Iraq dominating headlines, it is easy to miss less high profile changes to EU and UK export control which can have significant implications.

Breach of export control legislation is a criminal offence, and a successful prosecution will not only lead to reputational damage, but hefty fines or in serious cases, a prison sentence. Any investigations also take consideration internal business resources and time to deal with.

In addition to sanctions and embargoes in place against specific countries, in the UK there is a framework of legislation comprising EU and UK law that regulates the export (including electronic transfer) of "controlled" goods, software or technology from the UK to any country outside the EU that companies need to be aware of. The UK Export Control Organisation (ECO), which is part of the Department for Business, Innovation and Skills (BIS), issues licenses, monitors compliance and provides guidance to companies on the export of controlled goods.

The UK Strategic Control List forms the basis of determining whether any products, software or technology are controlled and covers items used for military purposes. In addition and more relevant to non-defence high-tech companies is that the list also covers a number of items normally used for civilian purposes which have the potential to be used for military purposes or terrorism, commonly known as "dual use" items. The list of these is set out in the EU "Dual-Use List" which forms part of the UK Strategic Export Control List.

As part of the ongoing review of the EU export control system to adapt to rapidly changing technological advances, in December 2014 a new EU Dual-Use List came into force. The introduction of the new EU Dual-Use list received little media coverage, but it contained over 400 changes, including the addition of new and removal of previous controls and changes to certain technical parameters. These changes need to be carefully considered by all exporters, but in particular companies involved in research and development or production and trade of high-tech products across a range of industry sectors. If a company's products (including hardware and software) have been added to the list, they are now subject to export control and will require a licence for export outside the EU.

The European Commission has published a 'Comprehensive Change Note Summary' to be used by exporters to determine whether the export of their technology is affected by the changes, which is accessible via the ECO's website and is available here. BIS has also published a useful summary of the changes in each category of the list which is available here.

One change of particular interest to high-tech companies is that the Cryptographic Note has been updated to include hardware and software components. The Cryptographic Note is intended to de-control items such as information security equipment and software that is available to the general public for home, office or business use. In addition to the updated Cryptographic Note, the new Dual-Use list includes new notes de-controlling Personal Area Network equipment and business local access equipment.

Businesses are advised to check the changes to the Dual-Use list to find out whether their exports are now controlled and require a licence for export outside the UK. Companies also need to adopt a workable internal compliance system in order to stay up to date with both international embargoes and sanctions and changes to UK export control rules, to avoid breaching the law and having to deal with the consequences.

For more information, please contact Emily Jones or Rachel Dowle at Osborne Clarke (emily.jones@obsorneclarke.com or rachel.dowle@osborneclarke.com).

Bristol trains more quantum engineers…

The UK government has committed up to £15 million to train the next generation of quantum engineers.

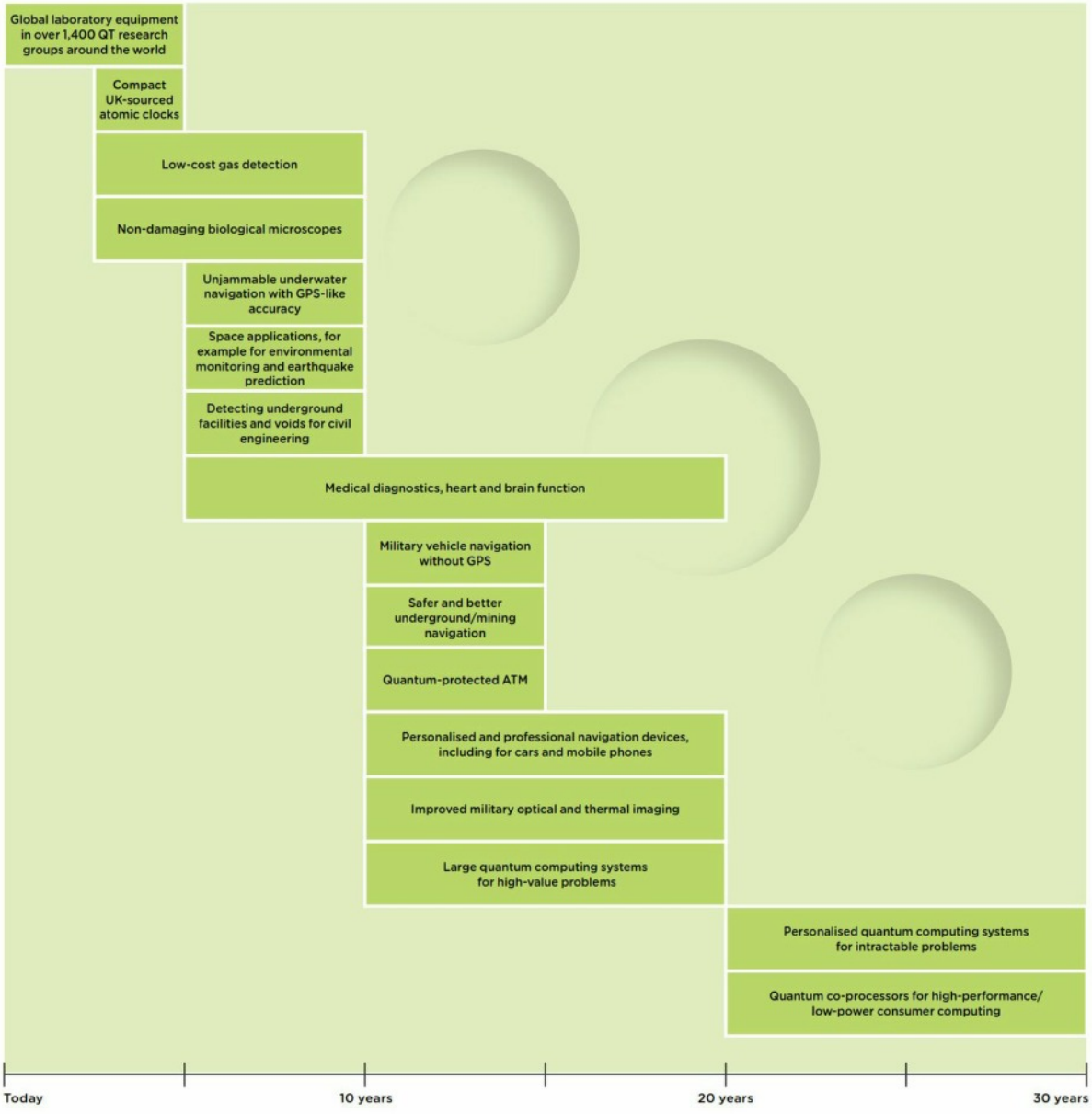
The funding – via the Engineering and Physical Sciences Research Council (EPSRC) – will be used to create a number of quantum technologies 'skills hubs' across the UK, which will work in partnership with industry to deliver training and career development programmes for PhD students.

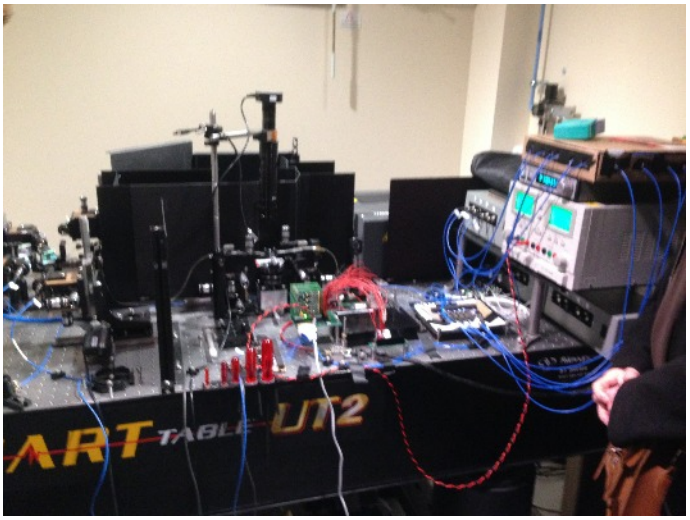
The University of Bristol Quantum Photonics Centre started its Quantum Doctoral Centre last year with 10 postgraduates, and is currently recruiting next year's cohort. The postgraduate researchers are deliberately recruited from a wide range of backgrounds, including computer science as well as physics, to tackle some of the key challenges of building the next generation of quantum systems.

The move comes as the National Quantum strategy was announced with a roadmap for Quantum technologies (below). This appears to be a conservative roadmap - do you agree? Comments to nick@swinnovation.co.uk would be welcome.

Researchers at the centre seem to be ahead of the roadmap as they have already built an integrated two photon quantum computer using existing silicon technology through the Europractice multi-wafer programme. They have also built a 6 photon programmable quantum computer that is being used to test out and verify existing quantum designs.

While a 6 photons may seem to be a step on the way to the equivalent of an 8bit processor, each photon can have up to 20 separate states. This allows calculations with up



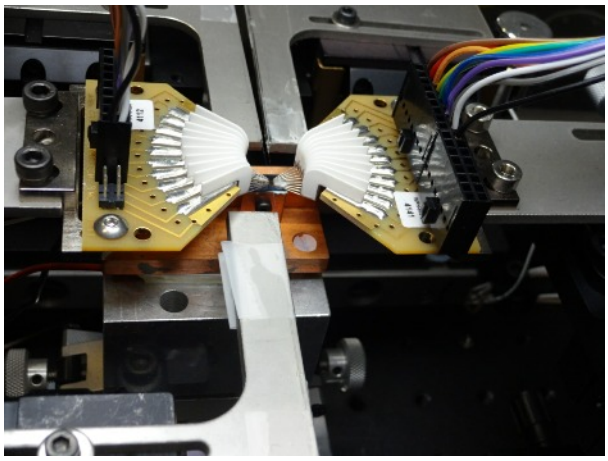


to 50,000 individual states to be processed and allowed all the existing quantum experiments have been repeated in a matter of a few weeks (on the equipment left). The Centre also partners with D-Wave which has a quantum computer technology that handles quantum calculations in a different way.

"From cameras that can see through smoke to cracking down on Internet fraud, quantum technologies are taking innovation to a whole new level and offer an unparalleled opportunity to shape the next generation of high-tech products that will improve our day-to-day lives," said outgoing Business Secretary Vince Cable. "This £15 million investment will ensure we have the flexible, highly-skilled workforce needed to turn these futuristic ideas into a reality."

… with silicon chip quantum teleportation

The core circuits of quantum teleportation, which generate and detect quantum entanglement, have been successfully integrated into a photonic chip by an international team of scientists from the universities of Bristol, Tokyo, Southampton and NTT Device Technology Laboratories. These results pave the way to developing ultra-high-speed quantum computers and strengthening the security of communication.



New research at the University of Bristol led by Professor Jeremy O'Brien has taken those optical circuits and implemented them on to a silicon microchip measuring just a few millimetres (right). This is the first time quantum teleportation has been demonstrated on a silicon chip and the result has radically solved the problem of scalability. The team of researchers have taken a significant step closer towards their ultimate goal of integrating a quantum computer into a photonic chip.

"Being able to replicate an optical circuit which would normally require a room sized optical table on a photonic chip is a hugely significant achievement. In effect, we have reduced a very complex quantum optical system by ten thousand in size," said Professor Jeremy O'Brien, Director of the Centre for Quantum Photonics at the University of Bristol, who led the Bristol elements of the research.

Quantum Imaging Centre opens in Glasgow

QuantIC – the Quantum Imaging Centre – opened in Glasgow at the end of February. Professor John Rarity and Dr Jonathan Matthews from the Centre for Quantum Photonics at the University of Bristol are co-investigators on QuantIC, making the University of Bristol a major partner. QuantIC is led by the University of Glasgow and also includes the Universities of Edinburgh, Heriot-Watt, Oxford and Strathclyde.

QuantIC's interdisciplinary team will link with global industry on imaging and sensing systems with breakthrough functionality by developing quantum-enhanced multidimensional cameras for future commercialisation. This will include imaging with the most minimal, or only infrared, illumination; imaging at wavelengths unachievable by any conventional camera technology; and imaging the microscopic world using quantum light.

http://www.epsrc.ac.uk/newsevents/news/quantumtechhubs/

The world's first programmable city…

Bristol is Open launches with key partners

The Bristol is Open programme is aiming to be the world's first programmable city by opening up a scalable software defined network (SDN) operating system to researchers and companies.

The netOS operating system developed by the High Performance Computing group at the University of Bristol runs on the BlueCrystal supercomputer at the University and controls a network of 144 fibres across the city of Bristol, giving terabit/s of bandwidth. The key to the programme is that the network can be divided up into separate virtual 'slices' so that many applications can all run independently. This will allow individual applications from 100Mbit/s up to 100Gbit/s to be tested out, something which hasn't been possible up until now, says Prof Dimitira Simeonidou, head of the research group and chief technology officer of Bristol is Open. All of this is combined into the CityOS and makes it fundamentally different to other smart cities such as Barcelona.

The network currently has four nodes connecting the University, the EngineShed business acceleration centre, the Watershed digital creative incubator and the @Bristol science centre. This will allow startups to use the network to develop new smart city hardware and applications. It will also allow the Planetarium at @Bristol to be used to display immersive 3D Ultra HD video over the network coupled with data from BlueCrystal.

Part of the aim is to be able to research future generations of technologies needed for mobile wireless, says Prof Simeonidou. "We are researching 5G at the moment but this has to be able to support 10Gbit/s speeds for when 10G wireless comes along," she said. Elements of this are already happening with Blu Wireless Technology using its 60GHz gigabit wireless technology to connect to the network (see page 13).

The optical switches (above) are coming from Polatis and BiO has signed a memorandum of understanding with NEC for more network equipment. It is also working with Silver Spring to install a mesh network using the WiSUN protocol on lampposts across the city to collect data. Bristol City Council will also make data from the city available as part of the programme.

The other key aspect is the ability to emulate, rather than simulate, other cities with many more nodes. The emulator is based on Xilinx FPGA cards and allows the network topology of other larger cities to be run on the BiO infrastructure. This would allow cities such as New York or Hong Kong to test out new topologies and applications for 1000 or 1500 nodes, using real infrastructure and real data, without impacting on the running of a megacity. And because the Bristol network is connected to high bandwidth academic networks such as SuperJANET, real data can be used to test out the emulation in real time. Bristol's sister city of Guangzhou in China is already interested in using this capability.

…. with UltraHD 3D fly through video…

The planetarium at the @Bristol Science Centre is being re-fitted with the latest technology to take advantage of the infrastructure of Bristol is Open. With two 4K ultra high definition projectors, the hemispherical screen will be able to show the latest immersive video over the network.

As one of the nodes on the network , it can also project data overlays from with access to the supercomputer to combine video, graphics and data in different ways, including 3D fly-throughs.

The Planetarium is due to re-open in April and will be available for corporate events, from customer and partner presentations to product development sessions.

... and city infrastructure research

The University of Bristol is one of 13 university partners that have been awarded funding of £138 million for UK infrastructure research, based partly on the work done at Bristol is Open.

The UK Collaboration for Research in Infrastructure and Cities (UKCRIC) investment was announced in March and will apply globally important research to ensure that the UK's infrastructure is resilient and responsive to environmental and economic impacts.

The Faculty will contribute its innovative City Operating System (CityOS) to UKCRIC. The CityOS will allow detailed observations of how real city infrastructure systems, including the people who use them, actually work. The system will also enable rapid evaluation of new city technologies in actual city conditions.

"Bristol is recognised as a world leader in the experimental and city observation techniques that will underpin these improvements. Crucially, these techniques also cover our understanding of how people, businesses, government and other societal organisations interact with and are served by infrastructure," said Professor Nishan Canagarajah, Pro Vice-Chancellor for Research. "UKCRIC's innovative concept will enable Bristol's researchers to collaborate with academic colleagues, industry, local government and citizens in Bristol and across the UK and globally in producing new, world-leading, wealth creating approaches to provide the infrastructure we need in the future."

Colin Taylor, Professor of Earthquake Engineering in the Department of Civil Engineering, who is leading Bristol's participation in UKCRIC, said: "The University is delighted to be playing a central role within the UKCRIC initiative as it seeks to drive down the costs of the UK's £466 billion pipeline of infrastructure renewal projects. This will be achieved by improving our understanding of how infrastructure actually works at full-scale in the laboratory and in the field. Better understanding will reduce the need for conservatism and overdesign, which can increase costs. It will also make it easier to reduce the risks that currently hold back innovation and prevent us from exploiting new technologies that will deliver greater value from existing and future infrastructure."

www.bristolisopen.com

Government responds to robotics strategy

The government has published its response to the Robotics and Autonomous Systems Special Interest Group 2020 Strategy. It says it recognises the need to build on the local and national investment to support this technology and to raise the profile internationally of the UK's world-class position in robotics, and will create a Robotics and Autonomous Systems Leadership Council with industry, academia and government.

This is important for the region which already has a Robotics Network and is leading the research and development of autonomous systems and driverless cars through the Bristol Robotics Lab and Venturer programme.

"From driverless cars to life-saving surgery, robotics and autonomous systems are playing an even bigger role in business and our day to day lives. Our response is clear – we are serious about grasping the full potential of this multi-billion pound industry to help drive local and national growth and are putting in place the mechanisms to make this happen," said outgoing Business Secretary Vince Cable. The government says it aims to build on the UK's existing robotics and autonomous systems research and industrial capability to ensure that future growth and success is enabled across a broad range of core industrial sectors, such as aerospace, nuclear and automotive; in addition to enabling new capabilities in emerging cross-sector issues like demanding environments.

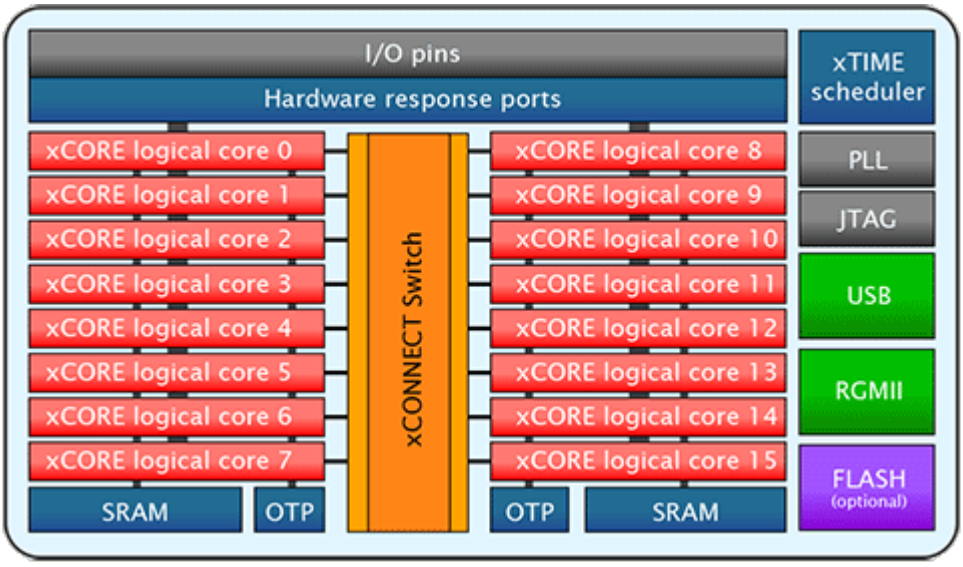
https://connect.innovateuk.org/web/bristol-robotics-network

XMOS launches its next generation controller

XMOS has launched its next generation of microcontroller with support from key global customers such as Cisco to provide Gigabit Ethernet Internet of Things for under $5

The xCORE-200 family delivers up to 2000MIPS of real-time computing power and is the first 10/100/1000 Gigabit Ethernet solution available with programmable MAC layer and Internet web server support. This opens up a whole new set of Gigabit-speed Internet-of-Things applications.

The 16-core XE216-512-TQ128 (below) will cost less than $4.75 in high volume and a complete family of devices will become available over the next few months ranging from products with 8 high-performance 32bit-RISC-processors, up to devices with 10, 12 and 16 cores. Advanced xCORE-200 products with 24 and 32 high-performance cores will be available in the second half of 2015.



"This next generation xCORE-200 product family delivers twice the performance and four times the on-chip SRAM memory, when compared to our first generation xCORE multicore microcontrollers," said Nigel Toon CEO of XMOS. "They add a flexible Gigabit Ethernet port alongside a high performance and programmable XMOS USB 2.0 interface, and devices will be available with up to 2Mbytes of on-chip Flash memory for system-level integration and security. This combination of performance and real-time flexibility makes xCORE-200 the ideal programmable platform for high performance consumer and professional audio, and emerging Gigabit-speed IoT applications."

XMOS has already sampled lead customers such as Cisco with the xCORE-200 and the xCORE-200 eXplorerKIT evaluation board. "The IoT market demands new infrastructure capabilities with greater scalability, flexibility and support for high-bandwidth applications and services. At openBerlin, the Cisco Internet of Everything Innovation Centre, we're working with the XMOS xCORE-200 on new applications and solutions for industrial IoT", said Dimitar Vasilev, CTO at openBerlin, Cisco IoE Innovation Platform.

"Our advanced system monitoring applications need the fastest response times and full timing synchronization and determinism in a very small package so that we can capture and process multiple critical sensing elements in real-time.," said Andy Lobato, CEO of Helitune. "The xCORE-200 multicore microcontroller family, which we can program and configure entirely in software, is a perfect fit for this demanding application."

A new release of the xTIME-Composer Studio development tools, provides full support for xCORE-200 family.

www.xmos.com/xCORE-200

Dyson moves into LED lighting

Consumer goods designer Dyson is moving into market for LED lighting through the acquisition of Jake Dyson in London. Dyson, based in Malmesbury, has strong engineering connections in Bath.

The LED subsidiary was set up by the son of founder Sir James Dyson, Jake, and uses the same heat pipe technology used in printed circuit boards to reduce heat and provide a lifetime of up to 37 years. It currently has two lighting products that will now be sold by Dyson and brings more microelectronics focus to the company that has also been leading in the development of robotic systems.

www.dyson.co.uk

Space Agency to boost new technology

The UK Space Agency has partnered with SETsquared - Europe's top university business incubator programme - to help stimulate innovation in space-related technology.

The new partnership will see the Space Agency fund 40 businesses to go through SETsquared's entrepreneurship programme, which will help them to hone their business plans, tighten their propositions and gain access to investors.

The businesses could be harnessing space technology for a range of applications – particularly using the data that is available from satellites to novel businesses that utilise near global communications, global position, navigation and timing services or the myriad of observations about our planet that satellites can provide.

"The space sector is a UK success story with aspirations to grow to a £40bn turnover by 2030. To achieve this, we anticipate hundreds of new companies will start providing new products and services that rely upon satellites. We are delighted that SETsquared, with its proven track record, will be on-hand to help these companies grow and flourish" said Colin Baldwin, UK Space Gateway Programme Manager at the UK Space Agency.

Simon Bond, Innovation Director at SETsquared, said: "We are seeing huge potential in some of the space-related research across the five universities. There are some ground-breaking technologies being developed that could become multi-million pound businesses. This partnership will effectively allow us to connect those 'gems' with the space sector and work together to nurture them."

SETsquared's incubation programme, ranked best in Europe and second best globally, has already fostered a number of successful start-ups working in the space technology arena. Among them is iGeolise, which relies on satellite data to power its Travel Time Platform. The company was formed in 2009 when its founder had the idea that it was more useful to find content on the web by the time it takes to travel there, rather than by distance. Since then, its team has built the Travel Time Platform that 'turns distance into time'.

The platform locates, ranks and sorts content by travel time, not distance. The company's API can be used by consumer facing websites or apps to help users do everything from search for the nearest pub by journey time to finding a house within a 30 minute commute to work.

www.gov.uk/government/organisations/uk-space-agency

Bristol & Bath SIG programme takes off

The Special Interest Groups (SIGs) under High Tech Bristol and Bath are taking off with the appointment of a network manager to drive meetings for education and skills, high performance computing, embedded systems and health technology. An immersion event brought together industry and educators and is followed by a working group event on April 16th.

The SIGs are a great way to allow people working in similar fields to connect up, and Dr John Bradford is working at HBB to set up the activities for organisations in the Bristol and Bath area. The SIGs are open to individual and corporate members anywhere in the world, bringing together expertise in a wide range of technologies. There are already ten members, with interests in wireless, multicore, embedded software and education and skills, with more joining every week. Bristol is Open (page 9) will be a key part of the activities of several of the SIGs. We are also lookng at setting up a SIG on High Tech Marketing for companies and individuals in the region.

Unlike other SIG organisations, HBB will use the existing strong networking organisations in the region to host events and keep the administration overheads as low as possible while delivering key pieces of work. A number of SIGs have been proposed, with SIG champions needed to lead them and determine their direction.

HBB is a membership organisation where companies or individuals join and any staff or faculty member can attend any SIG meetings, vote for SIG champions and propose new SIGs. There are plans for a wider range of additional benefits that will be developed to support members.

For info and to sign up, contact: Dr John Bradford, john@hbb.org.uk or Nick Flaherty at nick@swinnovation.co.uk

www.hbb.org.uk

Blu Wireless shows gigabit wireless chip technology

Blu Wireless Technology has been demonstrating its HYDRA gigabit modem technology in a chip at the recent Mobile World Congress trade show in Barcelona.

The baseband system IP for 60GHz wireless has been implemented in a 40nm CMOS chip that can be used for the 'WiGig' 802.11ad 60GHz version of wifi that is starting to get traction in laptops and talets. It can also be used for wireless Back Haul for LTE mobile networks and for other high speed networks such as Bristol is Open and BWT supplies a complete multi-Gigabit capable baseband processor with all the associated firmware so that customers can quickly build their own millimetre wave gigabit wireless modem chips.

"The successful validation and demonstration of our HYDRA Gigabit System IP represents a major milestone in Blu Wireless's technology roadmap," said Henry Nurser, CEO. Developed in Bristol, the Hydra chip is based on a unique and patented architecture, which combines software defined parallel processing functions. These are controlled using a MIPS microAptiv CPU with hardware accelerators for fixed communication functions. This allows customers to adapt and add value to wireless modem applications with unique algorithms for channel equalisation, modulation or beamforming – all programmable through the robust, industry standard software tools provided by Imagination Technologies for its MIPS CPUs. Imagination has two design centres in the region.

This collaboration with Imagination is vital, says Nurser to get the maximum performance and efficiency from the multiple MIPS CPUs in the design. "Blu Wireless has made excellent progress with their innovative HYDRA IP implementation on 40nm," said Tony King-Smith, EVP of marketing at Imagination Technologies. "We're impressed with the performance they have achieved, thanks in part to MIPS' high-performance, power-efficient architecture for multi-core embedded designs, and our comprehensive MIPS tools. "

HYDRA has been integrated with a 60 GHz phased array radio front-end to create Blu Wireless's Lightning evaluation and development platform which are available now as well. The module integrates a full 'OpenFlow' SDN client which supports wireless mesh networking. It is currently being deployed as part of Bristol is Open to demonstrate gigabit rate wireless mesh networking for dynamic data backhaul applications.

The 'Lightning' module is integrated into a robust mechanical housing for deployment in outdoor applications and is available with a mounting kit for lamp posts. "The 'Lightning' module represents a total system solution for the next generation of flexible gigabit capable backhaul technologies," said Mark Barrett, CMO at Blu Wireless. "The unique combination of low profile 60 GHz phased array technology, gigabit modem and adaptive mesh networking using SDN 'Openflow' techniques will deliver lower costs and scalable data delivery capabilities." www.bluewirelesstechnology.com

UltraSoC taps region for chief executive

UltraSoC, the Cambridge-based developer of advanced debugging and analytic technology for embedded systems, has appointed Rupert Baines as its new CEO.

Baines, a Bath-based 30-year veteran of the global semiconductor and communications industries, has previously held senior roles in both start-ups and prominent trans-national companies. Most recently he was VP of Strategic Marketing at Mindspeed in Bath following that company's acquisition of Picochip (now part of Intel), where he had served as VP of Marketing.

"UltraSoC has a great team and game-changing technology," said Baines. "We're not only empowering designers to create better products 'first-up', more quickly and easily – we're also giving them the opportunity to use connectedness and analytics to refine the performance and features of those products when they're actually in use. This really has never been possible before."

UltraSoC's IP embeds debug and analysis capabilities into the silicon chips that are used in today's electronic products. This allows chip designers to design and debug their devices more quickly, and to offer their customers innovative features such as in-service power consumption optimization, self-testing and failure detection.

"Rupert has an outstanding track record of success in leadership and category definition in technology markets," said Chris Gilbert, Chairman of the UltraSoC board and formerly CEO of Swindon-based Ubiquisys, acquired in 2013 by Cisco in a $310m trade sale. "We believe his passion and ability to translate great technology into real-world impact are exactly what's needed to take UltraSoC to the next level of success." www.ultrasoc.com

Health meets tech in first regional meetup

If you are interested in the intersection between health and technology, don't miss the inaugural Bristol Health Tech Meetup on Thursday 23 April at 6-9pm at the Engine Shed, Bristol BS1 6QH. This is the first of a series of Health Tech Meetup events brought to you by Bristol Health Partners and the health and high tech sector groups of the West of England Local Enterprise Partnership.

This networking evening will explore Bristol is Open, the new high speed network connecting central Bristol going live this spring, enabling cutting edge research and development projects. Paul Wilson, CEO of Bristol is Open will kick things off, followed by presentations from Bristol Health Partners Director David Relph and Nina Cross, Informatics Lead at the West of England Academic Health Science Network.

It is free to attend and will give you the opportunity to network with like-minded people to discuss health and care innovation, and hear about some of the amazing work going on in Bristol, all while enjoying refreshments. You are welcome to bring along demos and details of your own or others' projects.

Tickets for this inaugural Meetup event are available on a first come, first served basis for anyone interested in health technology, with a number of tickets reserved for people from:

- the nine Bristol Health Partner member organisations
- affiliates of the high tech and health sector WoE LEP groups
- the West of England Academic Health Science Network member organisations
- the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care West
- the Clinical Research Network - West of England
- people in Health West of England

Bristol Health Partners is a dynamic collaboration between the three NHS trusts and three Clinical Commissioning Groups serving the Bristol city region, the city's two universities and its local authority. This partnership intends to help integrate, promote and develop the health and care sector in and around Bristol.

Sign up here on Meetup

Last month of Tesla's pop up shop

Electric car pioneer Tesla has set up a 'pop up' shop in the Mall at Cribbs Causeway, showing its latest technology. This includes 17in touchscreen control systems and an 'autopilot' mode that uses a range of sensors and radar to steer the car.. The Model S accelerates from 0 to 60 in 3.2s using multiple electric motors. The shop is set to close in May.

www.tesla.com

World first with CycleEye technology

Bristol is to be the first city in the world to install the CycleEye cyclist sensor alert system designed by Bristol-based Fusion Processing.

Funding from the Local Sustainable Transport Fund will support the installation of CycleEye units on a number of buses operated by the city's main operator First West of England. CycleEye was trialled by both First West of England and Transport for London in spring and summer 2014 and showcased at Euro Bus Expo 2014 in November.

Jim Hutchinson, founder of developer Fusion Processing, said: "It's a massive boost to us to receive this order from Bristol City Council following First's trial of CycleEye last year. The advanced sensor and processing systems developed by Fusion can play a big part in intelligent transport, both now and in the future. We're moving into an age where smart cities are harnessing technology to make travel and transport better and safer for people, and that has to be a good thing."

Fitted to the side of a bus, a CycleEye unit uses radar and camera sensors to identify cyclists in potentially dangerous situations in close proximity to the bus, and gives an audible alert to the driver's cab. The unit is operable night and day in all weathers. It is unique in the way it alerts drivers - the intelligent system is programmed to ignore other nearby objects such as bollards, railings or other vehicles so they are not mistaken for bikes, cutting out the false alerts that have been an issue with other cycle safety technologies. The audible-only system also reduces cognitive overload on the driver, allowing them to respond faster to potentially critical situations.

Over 19,000 cyclists were injured or killed on UK roads in 2013, with around 75 per cent of the 3,000 serious or fatal accidents occurring in urban areas. Around a quarter of accidents resulting in serious injury to a cyclist involved a bus, coach or HGV.

www.fusionprocessing.com

Bath's CREATE lab research showcased at the Big Bang Fair

Members of the CREATE lab in the University of Bath's Department of Psychology showcased their research on the EPSRC project, SuperIdentity, at the recent Big Bang UK Young Scientists and Engineers Fair at the NEC in Birmingham.

CREATE lab director Danaë Stanton Fraser together with Lia Emanuel, Susanna Martin, Eleanna Skoulikari and Lauren Barnes were on hand at this public event where they engaged with children and adults alike in featuring research from the SuperIdentity Project and learning about the science behind identity.

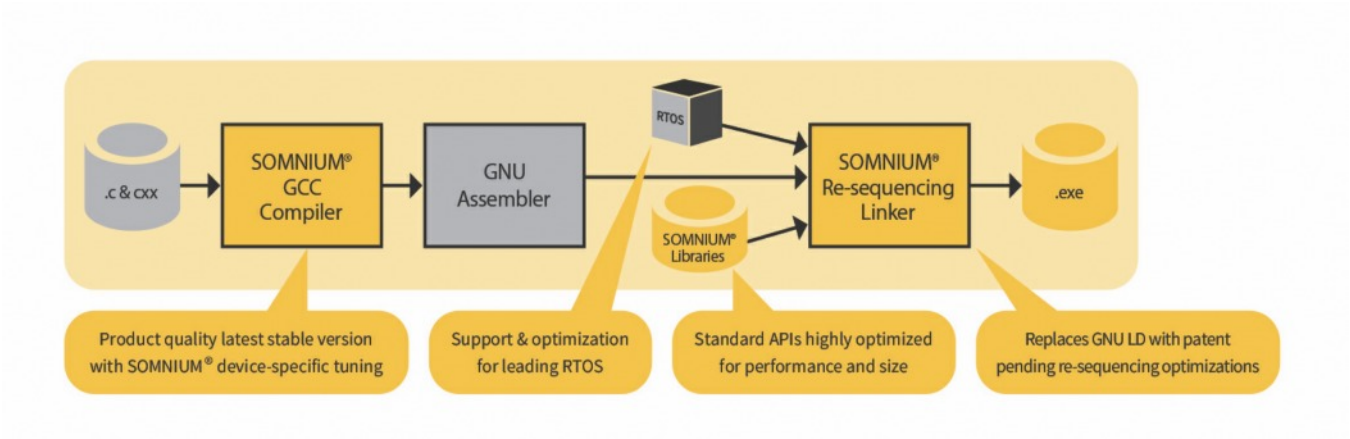
The project's Identity Detectives stand hosted hands-on activities where visitors explored how specialist thermal and infrared cameras can help forensic scientists see different identifiable aspects of our hands and how online identity through creating avatars and seeing how much these online icons say about ourselves.

Somnium uses TVS to test its products

Bristol design tool startup Somnium Technologies is using the local expertise of TVS to test out its technology before its launch.

Somnium has developed a new way of developing embedded code to make the process much more reliable and bug free, and TVS performed important installation testing of Somnium DRT. This uses a patented re-sequencing technology to automatically optimise embedded software, resulting in smaller, faster executables. Before DRT's general availability release, Somnium wanted to be confident of the best out of the box experience for its customers, who use a wide variety of host platforms.

"Installation is the first step in the user experience, and it is often under-tested in real-user scenarios," said Dave Edwards, Bristol technology entrepreneur and Founder and CEO/CTO of Somnium Technologies. "We felt it was best practise to bring in a level of independence and we naturally turned to TVS because of its expertise in this area."



Jamie Packer, VP of Customer Engineering at Somnium added: "We already perform extensive automated testing of functionality and standards compliance using several test suites. However, it is impossible to automate the experience of new users with different expectations and a variety of hardware and software configurations. The testing performed by TVS was extremely useful and thorough. TVS tried a number of interesting corner cases. This has led to improvements in both the installation process and the documentation."

"SOMNIUM is very proactive in recognising the importance of independent installation testing. Many companies overlook this aspect, and hence many new users report a negative experience when starting with a new tool," said Mike Bartley, Founder and CEO of TVS.

www.tanvsolutions.com

About the West of England Local Economic Partnership

The West of England Local Enterprise Partnership supports business growth and is working to attract new jobs to Bristol, Bath and Weston-super-Mare. The structure supports the LEP Board in making it happen, backed by multiple Sector Groups including the High Tech Sector which meets once a month. More information on the vertical and cross cutting sector groups is here. For more information or to get involved join the LinkedIn group and sign up for the High Tech Sector Newsletter at SW Innovation News for news of events and Special Interest Groups

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