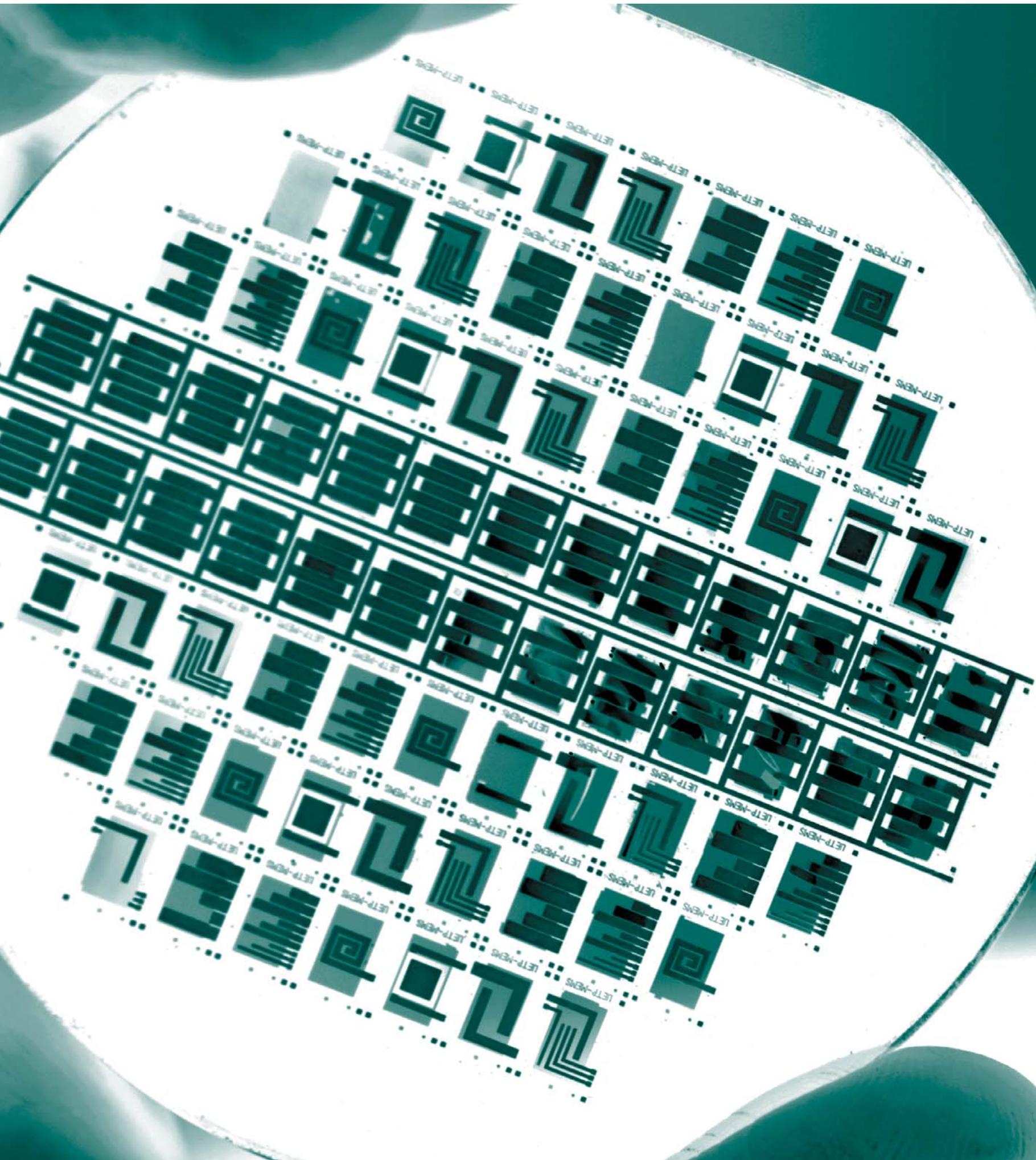


# enterprise

ISSUE THREE

A UNIVERSITY OF TEESIDE MAGAZINE



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Welcome to the third edition of *enterprise*, the magazine that takes an in-depth look at how academics and business are working together on Teesside.

In this issue, we focus on new technologies, and how the University's research and development teams are harnessing them to improve ways of working and enhance quality of life.

Nanotechnology is a branch of science with enormous potential impact on our lives. We look at some intriguing new products that can bring healthcare direct to the home.

New methods of website design from our Special Needs Computing Unit are making it easier for people with disabilities to get online. And construction researchers, using the latest digital visualisation techniques, are helping the London Underground deliver a major building project in record time.

Elsewhere, we see how innovative business ideas from Teesside graduates are spawning new companies and creating jobs in high growth sectors.

It was especially pleasing to hear, as we were putting this magazine together, that the University's business track record had attracted a £3m national grant award. This will give us a head start with the radical enterprise strategy described inside by Professor Mike Smith. The grant, one of the largest awarded, will help us create the basis for more research and development applications and build even stronger business partnerships

We're facing an exciting enterprise future at Teesside. Research and development is critical to business competitiveness and prosperity in the region. Here at the University, we're putting the people, skills and expertise in place to create the right climate for business success.

Laura Woods

**Director of Academic Enterprise**

University of Teesside

This publication is available in alternative formats on request. Please call Catherine Kearney on 01642 384577, email [cfe@tees.ac.uk](mailto:cfe@tees.ac.uk)

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Editor NIC MITCHELL  
Photography JUDY HUME  
Design CHRIS LOFTHOUSE

To find out more about the stories featured email [pr@tees.ac.uk](mailto:pr@tees.ac.uk) or telephone 01642 342018.

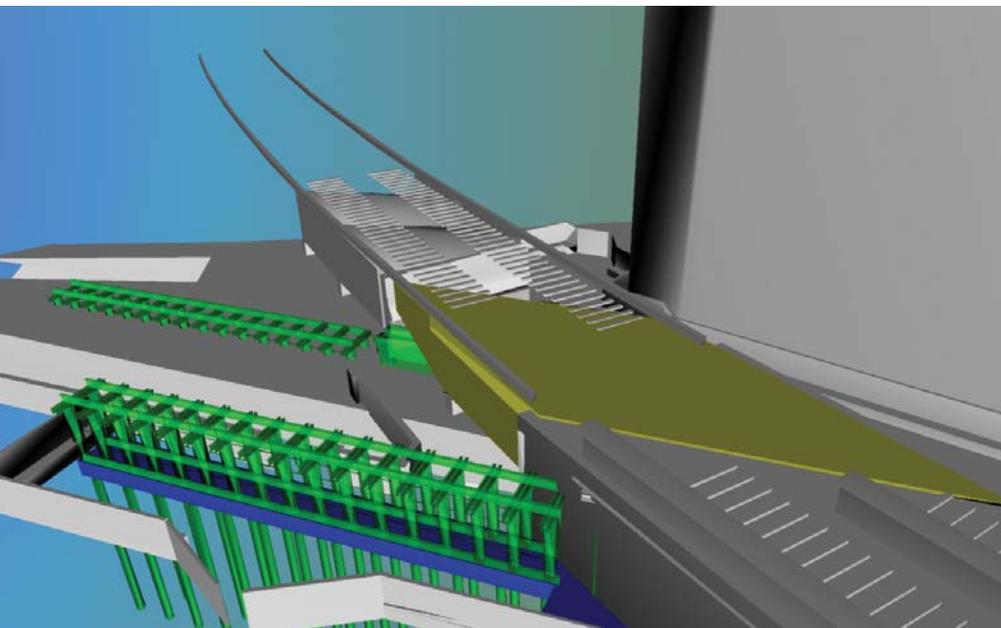
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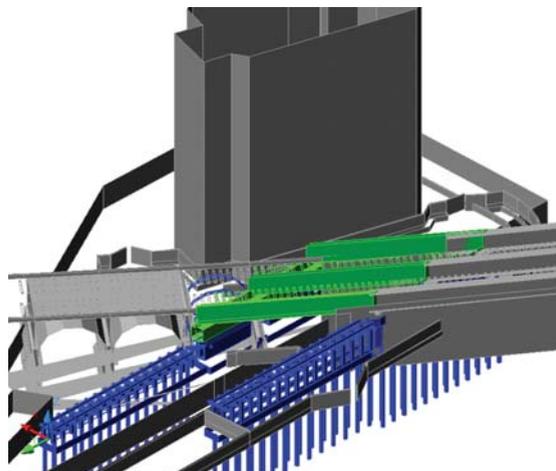
# ON THE TUBE

Researchers on Teesside are revolutionising the way complex construction projects are tackled with their new **virtual design planner**.

Here Nic Mitchell finds out how the invention will help a massive project on the London Underground.



Virtual reality images of the London Underground bridge project



It is going to be one of the toughest challenges for the construction industry. Dismantling a bridge over one of the busiest stretches of the London Underground and slotting in a stronger replacement to allow a new branch of the Central line to be constructed underneath.

The site is next to BBC Television Centre at White City and the builders have only three days to complete a task that would take months, if not years, in normal circumstances.

But such is the pressure from the capital's commuters that a three day shutdown is all that London Transport will give the construction team involving Balfour Beatty. The demolition and replacement bridge work will be carried out over either the Christmas or Easter holidays to minimise disruption to normal services.

To help manage the complex multi-million construction site and the huge amount of piling required, the construction team decided to take advantage of advanced technology developed at the University of Teesside to visualise as much of the work as possible beforehand.

They are using a new 4D design tool (3D + real time) developed by a team led by Teesside's Professor of Construction Management and Information Technology, Nashwan Dawood, pictured with a virtual image of the new bridge sliding into place in the University's Virtual Reality Auditorium.

"It uses the principles of virtual reality to visualise what conditions can be expected on the actual construction site – and adds the extra dimension of real-time scheduling; what we call optimisation in the construction IT world," said Professor Dawood.

"By using visualisation and optimisation technologies, we can rehearse the whole construction process over and over again until we have ironed out the difficulties we may face on the actual job. We can do this virtually from the architect's drawing board to the planning process, and in the comfort of our offices. This is much better than trying to put things right on a wet and windy construction site on a dark December day in West London.



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**“USING THE NEW 4D DESIGN TOOL, IT IS POSSIBLE TO IMPROVE PROJECT CERTAINTY AND REDUCE RISK IN AREAS SUCH AS COST, TIME, QUALITY AND SAFETY”**

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"A range of Computer-Aided Design (CAD), Virtual Reality and optimisation tools were used to create our computerised construction models and software. The trick is being able to visualise the work in 3D and optimise the schedules to assist the decision-making process before you start work on the actual construction site," said Professor Dawood.

Balfour Beatty's senior planner Martin Jenkins said: "We wanted a system that

would let every member of the team visualise the whole project at any stage of the construction process and that's precisely what the new 4D design tool developed at Teesside University does. It allows different contractors to get the same mental picture of any problems we are likely to face at any particular time and it doesn't matter whether they are on site or working remotely in their offices. This is going to be of tremendous assistance to heavy civil engineering projects like White City, where everyone is working under all kinds of pressure to get the job done within very tight deadlines."

The old brick built bridge, complete with archways, carries the Bakerloo line over the Central Line at the White City construction site – and the aim is to keep the Central Line running and just close a stretch of the Bakerloo line for three days while the old bridge is demolished and the new steel replacement slides in.

Professor Dawood has devoted much of the last five years to finding new ways of using Information Technology to assist construction site planning.

In July 2000, he was involved in a consortium of four universities (Teesside, Wolverhampton, UCL and UMIST) and 10 industrial partners (Stent, Services Design Association, Bond Bryan Architecture, Kvaerner Construction, WS Atkins, Turner & Townsend, Tarmac, AMEC, Carillion and Skanska) which won a three year £1½m contract from the Engineering and Physical Sciences Research Council (EPSRC).

The project involved colleagues from Teesside's School of Science & Technology and expertise from all the industrial partners and other academics to create a Virtual Construction (VIRCON) Site.

The VIRCON project led the team to developing new software tools to improve the functionality of existing software and new technology to help the planning process in major building contracts.

In particular, Professor Dawood worked closely with the Teesside planning team at Faithful & Gould, the international project management and construction consultancy, to perfect the visual planner design tool prior to its use on the London Underground project. The company has a major presence on Teesside and Ian MacKenzie, the company's Stockton-based national planning manager, is involved in helping to commercialise the new visual planner, evaluating possible markets and providing critical appraisal.

He said: "By using the new 4D design tool, it is possible to improve project certainty and reduce risk in areas such as cost, time, quality and safety. It also allows users to communicate the impact of proposed products and processes at both layman and technical levels. We can not only talk through but walk through a construction phase while the programme builds up the image on screen and we are confident it will reduce planning and construction errors."

Professor Dawood said the plan now is to set up a spin-out company with colleagues at the University of Teesside and commercialise the new design tool.

### **Contact Details**

Professor Nashwan Dawood  
Centre for Construction,  
Innovation and Research  
School of Science & Technology,  
University of Teesside  
Tel: 01642 342494  
Email: n.n.dawood@tees.ac.uk

A Strategy for

# ENTERPRISE

**Universities and industry need to work together more: that's the message from a Government looking to build a 21st century Knowledge Economy. In the Tees Valley this has led to a strong partnership between higher education and business and a challenging blueprint for enterprise.**

**Here, Professor Mike Smith explains how this has helped Teesside win a major funding award to help academics and the private sector do business together.**

**Knowledge transfer now ranks alongside teaching and research as a principal role for Universities. So it was a tremendous boost for the University of Teesside to win over £3m this summer from the national Higher Education Innovation Fund (HEIF) to support this activity.**

Managed by the Higher Education Funding Council for England, the fund aims to help universities work with companies to turn knowledge and ideas into new business opportunities.

I believe that our bid was welcomed because we were able to demonstrate a real commitment to this work, and because we have developed a clear strategy for putting the University at the heart of business growth and prosperity in Tees Valley and the North East.

Advanced skills, research and innovation are fundamental to economic success. Our graduate start-up companies are just one example of how we use academic knowledge and expertise to help businesses grow.

Through another mechanism, Knowledge Transfer Partnerships, the University applies its Research and Development (R & D) expertise to help companies develop innovative products and solutions with a competitive edge. In the past two years, 20 such partnerships have been formed with regional companies.

And business can access direct help in other ways too. Teesside's graduate placement programme, Bridges and Routes, matches graduate skills to company needs. The scheme's 80 per cent employment rate tells us that businesses value the service it provides.

With our HEIF award, we now have a real opportunity to build on these activities and deliver a sustainable strategy that

accelerates the commercial development of research and innovation and the creation of spin-outs and start-ups.

We'll also expand our support and consultancy services to promote business development.

To make all this happen, our outward-facing services will be expanded and strengthened with key appointments from industry. Business development managers will be taken on by the University to work with academic schools and encourage business involvement in academic courses and research.

Specialists from key sectors will work alongside academic teams in developing commercial applications. There will be a particular focus on strengths aligned with priority areas identified by the Regional Development Agency, One NorthEast. These include nanotechnology, health and medical devices, manufacturing and digital technology and media.

We'll also be setting up a pioneering Digital Knowledge Exchange, with Sunderland University as partner, to develop R & D, commercial opportunities and skills programmes in digital technologies for large and small companies alike. We plan to house the Knowledge Exchange in a new campus-based Institute of Digital Innovation as part of the DigitalCity initiative.

To underpin our academic expertise in entrepreneurship and help us to develop the raw material for business creation, a Chief Executive from the private sector will be recruited to our wholly-owned University company, UTEL Ltd. This will strengthen our responsiveness to commercial needs.

Finally, a high-level Enterprise Board, again with strong industrial representation, will govern the management and direction of our strategy.



**“TODAY, THE INDUSTRIAL LANDSCAPE HAS CHANGED ALMOST BEYOND RECOGNITION...BUT THE MESSAGE IS STILL THE SAME: KNOWLEDGE-BASED INDUSTRIES HOLD THE KEY TO ECONOMIC GROWTH, AND THEIR ROLE IN DRIVING RESEARCH AND INNOVATION IS PARAMOUNT.”**

Success will be gauged by a series of measures that will tell us exactly what impact our work is having on business performance. As well as primary indicators like business start-ups, consultancy contracts and placements, we'll be looking past these numbers at business survival rates, invention disclosures, patents, and business turnover.

These are good indicators of how well we're translating our know-how into successful business activity in the region. But all these plans are not such a step-change as they may first seem. For our links with industry go beyond our first days as a University – right back to the 1930s.

Seven decades ago, as Constantine College, we supported the shipbuilding and heavy engineering industries, when our

priorities included naval architecture and advances in metallurgy.

Today, the industrial landscape has changed almost beyond recognition, and the focus is on encouraging the growth of smaller businesses in sectors such as digital media.

But the message is still the same: knowledge-based industries hold the key to economic growth, and their role in driving research and innovation is paramount.

It's a message that both the Government and One NorthEast are keen to stress, and one we strongly endorse. The region stands to gain more than most from a strong partnership between business and higher education, because we've lost so much of our traditional industrial base in recent years.

In supporting economic regeneration, our enterprise strategy will also drive more applied research and fresh approaches to learning and teaching. It will stimulate more individual staff, students and graduates to engage in enterprise, and encourage more people to take the plunge and set up real companies that attract external investment.

I believe that there has never been a more exciting time to be an enterprising academic or student. It's up to us to make the most of the opportunity and make a real difference to the fortunes of Tees Valley and the North East.

*Professor Mike Smith joined the University of Teesside in late 2003 as Deputy Vice-Chancellor for Research and Enterprise. A medical scientist by profession, he is pictured above with a medical image of himself. He was previously Dean of Research in Leeds University's Faculty of Medicine, Dentistry, Psychology and Health, Director of R & D in the Leeds Teaching Hospitals and Chairman of MediPeX Ltd, a regional enterprise organisation involved with technology transfer in the medical and health sector.*

Turning Graduates into

# ENTREPRENEURS



**In little over three years 61 new companies and 100 jobs have been created through a trail-blazing initiative in Middlesbrough that encourages enterprising graduates to take the plunge and set up their own businesses.**

The scheme has attracted national attention with articles in *The Guardian* contrasting the Teesside approach with that of a more traditional university like Bristol.

*The Independent* and *The Mail on Sunday* have also focused on the new spirit of entrepreneurship being created through the University of Teesside's Upgrade<sup>2</sup> Graduate Enterprise scheme. The initiative provides help, advice and a home for new companies in graduate business incubation units around the campus.

Two of the graduate entrepreneurs, Doug Wolff, 25, from Onisoft and Liam Dawson, also 25, from YUZU, were invited to meet MPs at a VIP reception in the House of Commons last year. The event was organised by SET for Britain, the organisation promoting science, engineering and technology to the general public. The purpose: to highlight the success of university spin-out companies and, in particular, the commercialisation of university research.

The pair certainly stood out from most of the 50 or so teams of senior academic researchers representing universities like Imperial and Nottingham. Not just because of their ages, but also by their fresh approaches to turning bright ideas into commercial ventures.

Doug set up Onisoft with fellow Canadian Paul Dolhai after they both graduated from Teesside's MSc in Computer Graphical Applications. They are working hard to create the next generation of Japanese-style fantasy role-playing computer games and now employ eight full-time staff and two part-timers.

YUZU was launched two years ago by Liam and fellow Media Technology graduate, John Corner and specialises in creative technical solutions for the web.

The buzz they created at the SET event was quickly picked up by many of the MPs and Lords attending. The event's sponsor, Kerry Pollard, MP, chairman of the All-Party Parliamentary Group for Small Businesses, is pictured talking to Liam and Doug. Mr Pollard was among many of the parliamentarians who praised the Teesside entrepreneurial initiative and hoped that other universities would follow suit.

Upgrade<sup>2</sup> Graduate Enterprise is set to grow as renovation work on a listed campus building has just been completed to create a graduate enterprise centre. The development attracted £1.3m of financial support from One NorthEast and the European Regional Development Fund and the first 20 tenants have already moved in.

Laura Woods, Director of Academic Enterprise at the University, likens the Victoria Building development to a graduate business 'greenhouse' and she is looking forward to more Onisofts and Yuzus emerging from the scheme.

"It is a great advantage having the business support team and so many of the companies located close together under one-roof. They can learn so much from each other," said Laura.

Maurice Tinkler, Graduate Incubation Manager, said: "Many of the companies are specialising in innovative areas such as computer games design, animation and web services – all sectors which support Middlesbrough's ambition to become a 'DigitalCity' and all areas that draw on the University's strengths in computing and new technologies."

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**"IT IS A GREAT ADVANTAGE HAVING THE BUSINESS SUPPORT TEAM AND SO MANY OF THE COMPANIES LOCATED CLOSE TOGETHER UNDER ONE-ROOF. THEY CAN LEARN SO MUCH FROM EACH OTHER,"**

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**"IT DOESN'T MATTER THAT WE'RE ON TEESSIDE AND OUR CLIENTS ARE IN GLASGOW, LONDON OR IRELAND. THAT'S THE BEAUTY OF MODERN COMMUNICATIONS TECHNOLOGY."**

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**Few would have believed that John Corner would one day be running his own digital business when he was packing eggs and working in a sawmill in a North Yorkshire village a decade ago.**

But that's the turn-round in fortunes for the 34-year-old entrepreneur, who is pictured left with fellow YUZU director, Liam Dawson, centre, and co-worker Neil McCall in front of Middlesbrough's historical landmark, the Transporter Bridge.

John is now Managing Director of YUZU Ltd – a web-based business and one of a growing number of new enterprises emerging from a suite of campus-based graduate business incubation units in Middlesbrough.

He says: "I decided going to university was the only way I was going to change my life and I was right."

He graduated from the Media Production degree with fellow student Liam Dawson and both tried their luck as one-man entrepreneurs before joining forces to form YUZU at the start of 2003.

After a year being 'incubated' in a University business unit, they found ideal premises between Middlesbrough railway station and Middlehaven, the soon-to-be rejuvenated former Middlesbrough dockland.

They provide visual and creative solutions to companies wanting to make their internet presence more effective.

And according to John, it is a major advantage being outside London. "Our cost base is lower. And with the University of Teesside and its School of Computing down the road, we've got a ready supply of students eager to do some part-time

work. So no problem if we need a whiz-kid in computer graphics or animation."

Being outside the capital doesn't mean a lack of London and other big city clients, he insists. In YUZU's case these include night clubs in Scotland and throughout the north of England and an Irish company staging major motorbike races all over Europe.

"We also look after the website for an international model agency supplying male and female models for magazines like *FHM*, *Loaded* and *The Sun's Page Three*.

"So it doesn't matter that we're on Teesside and our clients are in Glasgow, London or Ireland. That's the beauty of modern communications technology.

"We're more competitive and Middlesbrough is pretty central. We can be in York or Newcastle in less than an hour and more digital media firms are springing up all over the North East of England."

### **Contact Details**

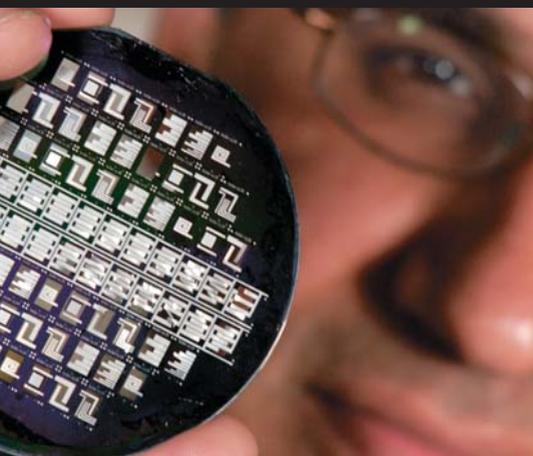
Maurice Tinkler  
Graduate Incubation Manager  
University of Teesside  
Tel: 01642 384425  
Email: m.tinkler@tees.ac.uk

We could all benefit from

# NANOTECHNOLOGY

The day may not be that far away when nearly every household in Britain could be equipped with its own miniaturised diagnostic system.

Nic Mitchell discovers how this will allow quick and easy blood or urine sample testing in the home and provide instant read-outs to confirm whether a chest pain is really an heart attack.



This is the hope of a group of North East scientists working to bring the wonders of space-age nanotechnology to the market place in the United Kingdom.

Known as point-of-care (POC) testing, the miniaturised diagnostic devices can monitor many of the health parameters in disease prevention. They are becoming increasingly popular in the United States, where the market for POC testing has grown from \$2.8 billion to \$4 billion in the last five years.

Dr Zulfiqur Ali, Reader in Science and

Technology and head of the University of Teesside's Centre for Applied Science, is among those who foresee great advantage in harnessing the advances in nanotechnology – the science of the very small – for the good of all.

"I can see no reason why every home in the UK should not be offered the chance of having these small, easy to use devices to monitor daily the health status of people living in the household," says Dr Ali, pictured with a test Micro Electro Mechanical system (MEMS) silicon wafer.

"The technology already exists to allow diagnostic testing to move out of the laboratory and into the home or where-ever the patient is.

"The devices are small enough to go anywhere and will be particularly important in situations where fast diagnostic monitoring can improve medical decision making, such as intensive care units and operating theatres or where the measurements are required to be made frequently and therefore need to be close to the patient.

"The great thing about these mini devices, which are often called 'Lab on a chip' type systems, is that you can do much of the clinical analysis at the bedside and this reduces the need to send samples to a centralised testing laboratory."

Among areas where Dr Ali believes the miniaturised system could be most beneficial are the easy identification of markers for diagnosing acute myocardial infarction (heart attack), urine drugs-of-abuse testing in the emergency room and whole blood chemistry for intensive care medicine.

He says: "The North East of England has a real strength in nano-microfabricated systems and the collaboration between the regional universities is proving very positive.

"We are positioning ourselves to be one of a small number of universities that can fabricate and develop miniaturised diagnostic devices and we are keen to further develop industry partnerships to carry out product development using these miniaturised technologies in a whole range of areas.

"By the end of 2004, we hope to establish a spin-out company that will market the work that is being carried out as well as performing contract research."

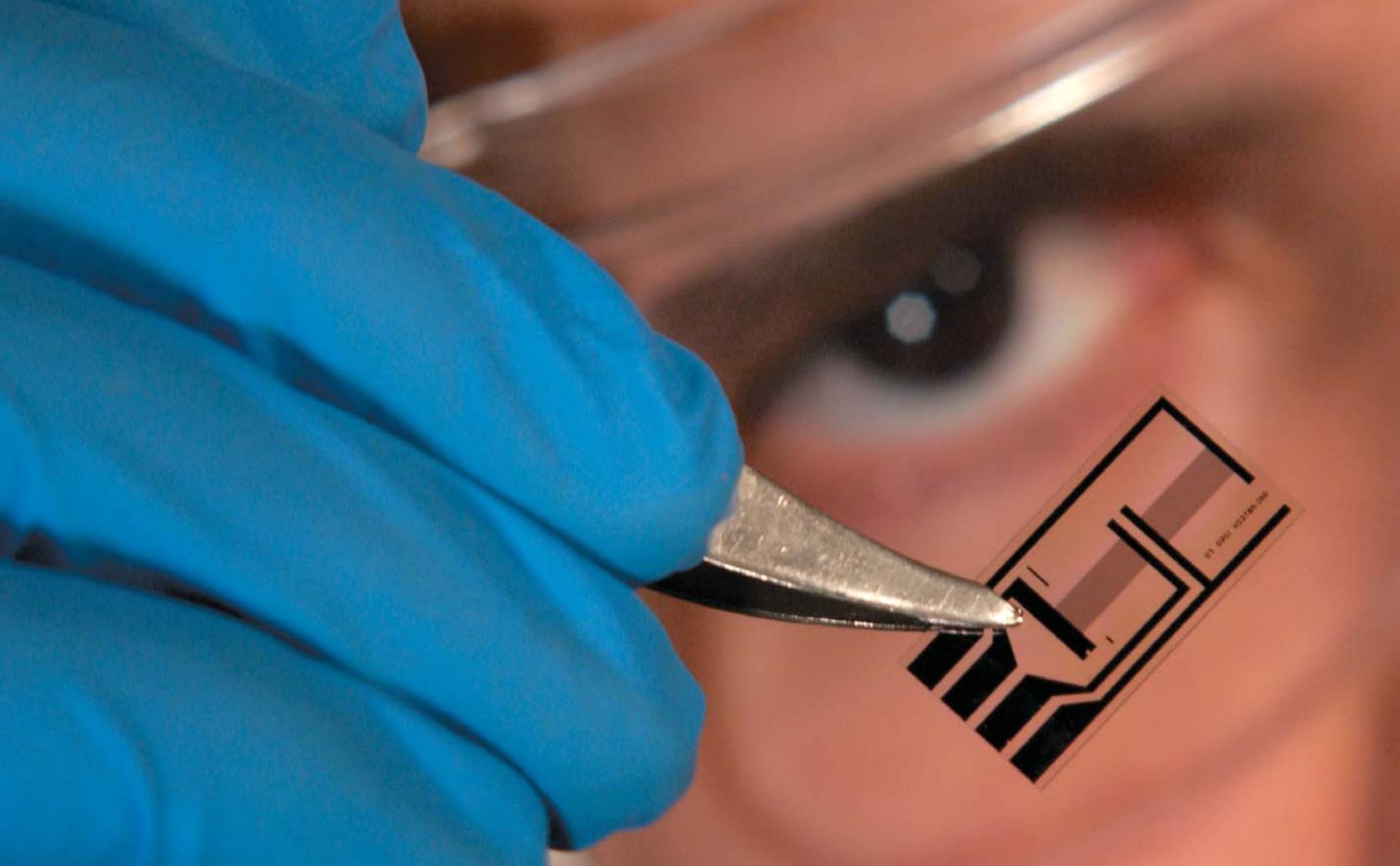
Dr Ali also wants to build on the University of Teesside's strengths in crime scene science and forensic investigation and develop the 'lab on a chip' miniaturised systems for forensic analysis at crime scenes and environmental analysis on location in cases such as river-pollution.

"We are already building these hand-held miniaturised systems in our labs and developing generic technologies that could be applied to any situation.

"While we are looking specifically at clinical and forensic uses for the miniaturised technology at the moment, I can see applications in the chemicals, pharmaceutical and biotechnology sectors.

Dr Ali's fascination with nanotechnology began over eight years ago when he arrived at Teesside to start work on a research project which led to the development of a prototype electronic nose.

The success of the first prototype has encouraged Dr Ali to move on to investigating whether the science of the small – nanotechnology – could help industry, the health service and bodies like the law enforcement agencies.



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**"THE DEVICES ARE SMALL ENOUGH TO GO ANYWHERE AND WILL BE PARTICULARLY IMPORTANT IN SITUATIONS WHERE FAST DIAGNOSTIC MONITORING CAN IMPROVE MEDICAL DECISION MAKING"**

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A major boost this year was the £1.3m of financial support to enable the University's School of Science and Technology to create a class 1000 cleanroom for the development of nano-microfabricated systems. The funding has come through One NorthEast, the Science Research Investment Fund (SRIF), European Regional Development Fund, University Innovation Centre (UIC) in Nanotechnology, and the Centre of Excellence in Nanotechnology, Microsystems and Photonics (CENAMPS).

"The cleanroom will be like a semi-conductor fabrication facility and we hope it will be up and running later this year", said Dr Ali. "We are also exploring the possibility of developing a virtual cleanroom lab for training purposes with our colleagues at the University's Virtual Reality Centre."

Cleanrooms are designed to reduce the number of dust particles in the air and are expensive to build because of the need for air-filtering equipment.

"We intend to use the cleanroom for product development with industry and other external partners," said Dr Ali.

### **Contact Details**

Dr Zulfiqur Ali, Reader in Science & Technology and Head of the University of Teesside's Centre for Applied Sciences.

University of Teesside

Tel: 01642 342499

Email: [z.ali@tees.ac.uk](mailto:z.ali@tees.ac.uk)

### **Fact File**

Nanotechnology – the science of the small – relates to structures and features that can be measured on a nanometre scale, which is about 100,000 times smaller than the width of a human hair.

Putting the Tees into a

# GREAT CUP OF TEA

The cuppa is one of the world's oldest and most popular drinks – but that's not to say that it can't be developed into a better beverage.

Here Nic Mitchell finds out about how scientists on Teesside are working with colleagues in the Far East to improve the humble cup of tea.

**What's the secret behind a great cup of tea – and can technology help make it even better? Those are the questions taxing scientists at the University of Teesside, who are seeking answers with the help of Professor Siromi Samarasinghe, a food chemist from Sri Lanka and President of the Institute of Chemistry, Ceylon (IchemC).**

She came to Middlesbrough as part of a six-month sabbatical last year arranged by a senior member of the University chemistry team, Dr Amara Jayaweera. He is also from Sri Lanka.

The visit laid the seeds for further research with Dr Liam O'Hare and fellow scientists in the University's Centre for Applied Science, who are looking to find a set of compounds distinct to Ceylon tea.

Dr O'Hare and Professor Samarasinghe have already been able to characterise unblended black tea samples from Assam, Sri Lanka and Africa in the University's labs, using a large-scale specialist Fluorescence Spectroscopy and high performance Liquid Chromatography instruments.

Now they want to develop an easy-to-use hand-held electronic system to ensure this quality can be measured and maintained while the tea is processed. Measurements of teas of varying quality are under way using samples of Ceylon tea which have been graded at the Tea Research Institute in Sri Lanka.

"We want to create an instrument that is small and robust enough to be used in the dusty tea sheds of Sri Lanka," said Dr O'Hare.

"Tea exports are very valuable to Sri Lanka and the quality of black tea, which is extensively processed before being sent overseas is measured in terms of flavour, strength, brightness and briskness," explained Dr O'Hare.

"At the moment the work is carried out by highly skilled graders, who can reliably detect small variations in quality. The graders take a long time to train, suffer from the human frailties of fatigue and inconsistency, and are limited in the number of samples they can examine. The best graders usually command high salaries from the western purchasers and blenders and the smaller growers and processors can rarely access this level of expertise."

Dr O'Hare said there are instrumental techniques, such as those used at the University of Teesside, which can help classify different teas, but the equipment is expensive and bulky and needs trained operators and experts.

"What is needed," says Dr O'Hare, "is a robust and inexpensive alternative system that could be used by the small producers."

Hence the interest in nanotechnology – the science of making things very small – to build an 'electronic nose' to distinguish between the aroma of different teas and an 'electronic tongue' to measure taste and strength. There's even talk of building an 'electronic eye' to measure brightness and colour.

It is all possible, says Dr Zulfiqur Ali, Head of Teesside's Centre for Applied Science. He has already designed an 'electronic nose' capable of helping the food industry monitor the shelf life of foods and detect contamination by analysing gases given off by the food substances using miniaturised sensors.

"These devices are commonly used to help grade different qualities of coffee and even different wine vintages, but up to now the technology has not been applied to the tea industry. We are about to change that," says Dr Ali.



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## “MORE OF THE SECRETS OF TEA ARE BEING REVEALED BY ANOTHER RESEARCH PROJECT...INVESTIGATING GREEN TEA”

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More of the secrets of tea are being revealed by another research project at the University. Nitin Seetohl, a PhD student from Mauritius, pictured, is working with Dr Liam O’Hare to investigate green tea.

Green tea is making inroads into the British market and the project is sponsored by the Japanese Gen Foundation, a charitable trust which supports research into the natural sciences and arts.

The project is also supported by San-Ei Gen, which makes and markets cold green tea throughout the Far East.

Nitin got to know them while working for his MSc with locally-based Oxford Chemicals. He was looking at the qualities of green tea and is extending this research for his PhD.

He says: "I particularly wanted to look at the different compounds, especially those that can improve the flavour. What are the volatiles? These are important because they affect the aroma and that’s the first thing you notice when you drink a cup of tea.

"Some people are put off green tea because they think it smells of green grass or tomato vines and that’s not what they expect tea to smell like," says Nitin.

Among projects he is developing for his PhD is an ammonia sensor and similar technology that could be applied to analyse the fluorescence of tea, which could help give information about the taste.

## What a Fine Set of

# DIGITAL FELLOWS

**Mackenzie Thorpe, one of Britain's most collectable and best-loved artists, is Middlesbrough born and bred. Although he now works mainly in the US, he turned to an inventive team of animators from his home-town University to bring figures from his paintings to life through the medium of animation.**

**The internationally acclaimed artist was delighted to discover that Middlesbrough possessed a talent for animation when he received a honorary Master of Arts degree from the University of Teesside in 2000.**



Since then links have been strengthened by Siobhan Fenton, a Senior Lecturer in Visualisation with the University's School of Computing. She wanted to make an animated film based on a character from one of a series of Mackenzie's paintings titled 'The Long Walk Home' and flew to New York to put the idea directly to Mackenzie.

"The central theme of these paintings is a lone figure battling against the elements as he crosses an unforgiving landscape," said Siobhan, who felt the central character would make a perfect subject for an animated film.

Mackenzie agreed and told Siobhan her ideas gave him a unique opportunity to literally bring his paintings to life and add an exciting new dimension to his sculpture and pastel work.

The artist said: "I was also keen to continue my long-standing relationship with the University; so it made sense for my first venture into digital animation to be supported by the University based in my home town of Middlesbrough."

The project was developed with backing from the University's DigitalCity Fellowship scheme, which harnesses European Union and Regional Development Agency funds to support graduates, alumni and international artists wanting to develop creative digital content on Teesside.

Through this and other support from her School of Computing, Siobhan put together a production team and the first person she contacted was award-winning Teesside graduate John Hedley, who impressed Mackenzie with the aesthetic and animation style of his film DADS. The film won a coveted Royal Television Society award in 2001 while John was a final year student.

John, pictured, graduated with a First Class BSc (Hons) degree in Visualisation from the University of Teesside and was snapped up by a leading games company in Sweden. But he wanted to return to England and jumped at Siobhan's offer to be the project's sole animator.

Others recruited to the production team were film-maker, Ian Fenton as director, fellow Animation lecturer, Clive Tonge, and Nick Lewis as modeller.

Mackenzie created several new paintings as reference for each particular shot and produced a series of painted textures and backgrounds to be incorporated into the animation.

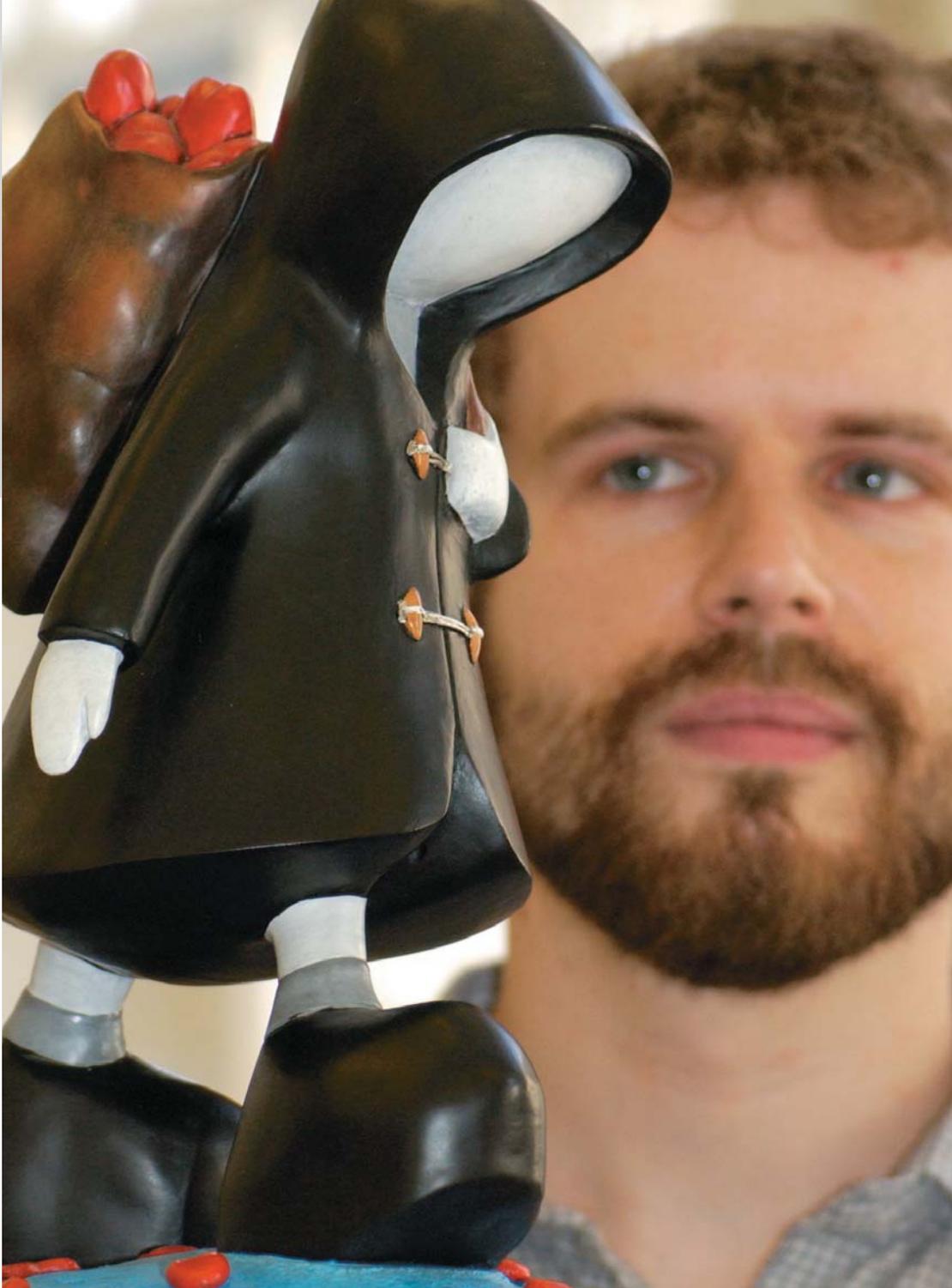
Mackenzie's artwork was then combined with computer-generated 3D models and the end result is a short pilot film with a unique style.

Siobhan says: "The pilot acted as a test for further collaborative work with the artist and we're hoping to develop this short into a ten-minute animation to be used to support Mackenzie's future promotional activities."

The pilot film also won one of the top prizes when DigitalCity Fellows exhibited their work earlier this year. Grants of up to £6,000 are available through the fellowship scheme, which encourages talented digital media graduates to stay in the region and develop their ideas further.

The top Digital Fellowship prize this year went to John Chadwick, who worked with fellow MA Computer Animation student Matthew Hooton on an atmospheric short film 'The Devil and Herge Gauche'. The film, heavily influenced by atmospheric Eastern Europe methods of animation, is based on the Faustian legend and a similar story attached to the legendary Saltersgate Inn in Whitby.

John, who directed the film, says that according to local legend, the landlord of the Whitby pub was tricked by the Devil to kill Satan, concealing his corpse beneath the hearth in the lounge. Should the fire ever go out, the Devil will return!



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**“PART OF OUR JOB IS TO CREATE AN ENVIRONMENT IN WHICH CREATIVITY CAN FLOURISH...THAT’S WHAT THE DIGITALCITY PROJECT IS ALL ABOUT”**

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Born in East Cleveland, John tried his luck as an animator in London before returning to the North East to study at the University of Teesside in 1996.

He said: "It was so expensive down there and my savings disappeared so I came back home. When I returned it was difficult to find anyone involved in animation on Teesside, but that has all changed."

The standard of work being produced with the support of the DigitalCity project has delighted the University’s new Deputy Vice-Chancellor for Research and Enterprise, Professor Mike Smith.

He says: "Part of our job is to create an environment in which creativity can flourish. It is not just about encouraging talented young people and our staff to stay on Teesside. It is also about encouraging innovative people from elsewhere to come here and make the most of the opportunities. That’s what the DigitalCity project is all about."

The DigitalCity project already supports a number of activities, including the University hosting the international animation festival, Animex, now in its fifth year.

The next major project planned is the creation of an £8m Institute of Digital Innovation on or near the campus, where postgraduate students and research staff can work together on projects and where bright new business ideas can be nurtured prior to their launch as spin-out or independent companies.

The Institute is likely to be home to the DigitalCity Fellowship scheme and will encourage graduates to follow in the footsteps of Doug Wolff and Paul Dolhai, two Canadians who came to Teesside to study on the MSc in Computer-Aided Graphical Technology Applications. The pair won DigitalCity Awards two years ago and have set up their own company, Onisoft, on campus developing computer games.

Opera Star Suzannah takes a new

# KOREA PATH

**Opera singer, football fan and now Middlesbrough ambassador, Suzannah Clarke visited North Korea, a country which holds a strong bond of friendship for the Teesside town dating back to the 1996 World Cup. Here she tells Michael Cratchley how the trip has inspired her to help the schoolchildren she met and open up dialogue with the secretive Communist country.**

The North Koreans have held Middlesbrough in their affections since those heady days of 1966 when their national team shocked the soccer world with a 1-0 victory over the mighty Italians at Middlesbrough's old Ayresome Park football ground.

Now, 38 years later, Suzannah Clarke, the Middlesbrough-born opera singer and ambassador for the town is forging fresh links.

She has visited North Korea twice since April last year and plans a third trip in her quest to build new bridges with the country. The link between the town and the remote people's republic was renewed in 2002 when the seven surviving members of North Korea's giant-killing squad returned to Middlesbrough as part of a national tour.

"After that visit, I was invited to give a number of concerts in North Korea in April of last year and was amazed at the warmth of the welcome I experienced from my host."

"It didn't take me long to realise that it was because I was from Middlesbrough," said Boro-supporting Suzannah.

"Our town has been held in the highest regard by the North Korean people ever since that famous victory at Ayresome Park during the 1966 World Cup. The team and officials were totally bemused by the level of support they received from Middlesbrough football fans."

While in North Korea, Suzannah was invited to go into the countryside to see the work of the World Food Programme and was inspired by the children she met.

"I was given the opportunity to visit a number of schools and discovered just how musical the kids were.

"The only problem is that they simply don't have the instruments that they need to develop their natural talent. So, on my return to the UK, I resolved to do something about it.

"I am now exploring alternative ways of acquiring these musical instruments and then getting them to the children of North Korea, a process that is calling heavily upon my skills of communication and negotiation acquired on the University of Teesside's Business Studies degree.

"The degree opened up the worlds of marketing, planning, finance and communication and helped me to develop a range of skills that I have been able to put to very good use over the last ten years or so.

"I prefer to organise most of my engagements without the help of an agent, which may sound somewhat unusual, but my approach hasn't appeared to hinder my singing career," she explained.

That career included training with the Royal Northern College of Music and then with Luciano Pavarotti's singing teacher, Arrigo Pola in Modena, Italy.

Since then she has performed as a Principal with La Scala, Milan, the Hungarian State Opera and English National Opera, the Welsh National Opera Company and Scottish Opera.

And multi-lingual Suzannah has also combined her skills with foreign languages with her love of soccer by singing national anthems at several international football matches, including England's European Cup qualifying matches against Albania at St James' Park, Newcastle and the clash with Slovakia at Middlesbrough's Riverside Stadium. In both occasions, she had to speed learn the national anthems in both native tongues.

Suzannah made a VIP return trip to Middlesbrough last year to receive an honorary degree from the University of Teesside for her services to music and promoting the town.

She sees her visits to North Korea as part of her ambassadorial role and as a way to explore new opportunities.

"While music is my first love, I have always been keen to broaden my horizons and develop other skills which I know will be useful," she says.

And that includes introducing children to the world of opera.

She's currently working closely with the UK Government's Creative Partnerships Initiative and working with schools in Darlington.



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**"WHILE SINGING WAS AND IS MY FIRST LOVE, I HAVE ALWAYS BEEN KEEN TO BROADEN MY HORIZONS AND DEVELOP OTHER SKILLS WHICH I KNOW WILL BE USEFUL"**

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"One hundred children took part in an opera production at Darlington Railway Museum in late July. I was amazed at how receptive and enthusiastic these children were," she said.

Suzannah is also being given the opportunity to develop her broadcasting skills and will be presenting a piece about the project on BBC Television's Inside Out programme.

"I'm really excited about this particular project because it gives me the opportunity to become involved in discussing some important local issues."

Her journey is clearly far from over and that includes keeping the lines of communication open to North Korea as it emerges from years of isolation.

# WEB Overcoming Barriers to the WONDERLAND

Research by the Disability Rights Commission revealed that eight out of ten websites are next to impossible for some disabled people to use. This means that every day internet activities such as online banking, booking cinema tickets and searching the web for last minute holidays or cheaper car insurance are either difficult or virtually impossible for many disabled people.

Here Beranice Semp talks to two visually impaired North Easterners about web accessibility difficulties and finds out how the Special Needs Computing Research Unit at the University of Teesside is helping to tackle the problem.

Mark Turnbull, BBC Radio Cleveland broadcaster and journalist, has a passion for the North East and making things happen. Up the busy A19, June Horne, Senior Strategic Development Officer, Equalities and Diversity for Newcastle City Council, is just as dedicated in her work.

Both surf the net on a daily basis and both just happen to be visually impaired. Each has strong views on web accessibility for people with disabilities.

June is part of a council project to make Newcastle City Council's website accessible to everyone who wants to use it.

She says that what has emerged is that "although it is important to keep improving the standard used for web design, we should remember that not everyone who has access to the internet has the latest equipment or software."

Mark, whose voice is familiar to thousands of local radio listeners, uses a Braille navigator and a speech synthesiser to get the best out of information technology 2004 style.

He describes the internet as a "magical wonderland" but gets angry because too many sites are cluttered and not at all simple to negotiate.

Mark and June have given a warm welcome to a new initiative that will help firms to make their websites more accessible.

The move follows the Disability Rights Commission's research showing that eight out of ten websites are next to impossible for some disabled people to use, with the most common problems being cluttered pages, confusing navigation, failure to describe images, and poor colour contrast between background and text.

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**"WE WANT TO MAKE WEBSITE SERVICES ACCESSIBLE, DESIGNING BETTER SITES FOR EVERYONE. WEBSITES ARE OFTEN TOO CLUTTERED, OFFERING POOR NAVIGATION AND A LOT OF DISTRACTIONS."**

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The Special Needs Computing Research Unit has been operating for more than a decade. It is a group of committed researchers and academics who are taking an in depth look at all aspects of computing for people with a disability.

A key objective is to enable small and medium-sized enterprises (SMEs) to meet the requirements of the Disability Discrimination Act 1995 and to conform to accepted standards and guidelines. By doing this firms can also improve their business practices to the benefit of all their clients. It's a tall order, but the team has already started in earnest on the two-year project; meeting companies to find out

what their needs are. Four staff, including research assistant Chris Bailey will be working with at least 24 North East digital media companies to meet disability legislation as well as improving their business practices online.

Dr. Pearson is at pains to emphasise: "This is not about simplifying sites in terms of design, and making boring text sites. We want to make web site services accessible, designing better sites for everyone. Web sites are often too cluttered, offering poor navigation and a lot of distractions. There are unnecessary animations, flashing lights and text inappropriately used, with language that is far too technical or not technical enough."

Dr. Pearson stresses that many sites are not designed for people who can't use a mouse to get around, or maybe have to use a head switch to activate the screen, have visual impairments or need voice recognition.

Then there are others who may have specific difficulties – someone with a newly broken arm, or an elderly person whose arthritis makes it difficult to use a normal keyboard or mouse. The list is endless, and the work demanding. Mark Turnbull and June Horne will no doubt follow its progress with more than a passing interest.

What has emerged is the need for organisations with websites, or those considering going online, to be more aware of the issues surrounding accessibility. Failure to comply with existing laws could result in legal action.

Help is at hand through the collaborative NITRO project, funded by the European Regional Development Fund and involving four of the region's universities, including Teesside. The project, which is supported by One NorthEast's digital centre of excellence, Codeworks, offers a comprehensive service to both web designers and companies with websites. A raft of issues, including accessibility awareness seminars, audit reviews of websites, resources and help with developing accessible websites, is being addressed.

Heading the contribution from the Tees Valley is Dr. Elaine Pearson, pictured, leader of the University of Teesside's Special Needs Computing Research Unit and a Principal Lecturer in Multimedia with the School of Computing.

"Having spent more than ten years researching aspects of accessibility and computing, we are very aware of the barriers that the web can present to people with disabilities, but it doesn't have to be that way. With care, good design and expert technical application, the web can become accessible to almost everyone."

She's delighted to have an opportunity to pass on the University's expertise to companies and help them find accessible solutions to websites and services. The project is costing £2.8m and Teesside's share of £300,000 will support the work being undertaken by Dr. Pearson's enthusiastic team.

Dr. Pearson stresses that many sites are not designed for people who can't use a mouse to get around, or maybe have to use a head switch to activate the screen, have visual impairments or need voice recognition.

Then there are others who may have specific difficulties – someone with a newly broken arm, or an elderly person whose arthritis makes it difficult to use a normal keyboard or mouse. The list is endless, and the work demanding. Mark Turnbull and June Horne will no doubt follow its progress with more than a passing interest.

### Contact Details

Dr Steve Green, Assistant Director (Enterprise) or  
Dr Elaine Pearson

School of Computing Research Office  
University of Teesside

Tel: 01642 384608

Email: [s.j.green@tees.ac.uk](mailto:s.j.green@tees.ac.uk)

# NEWS ROUND UP

## TONY BLAIR OPENS SPORTING SHOWCASE



Prime Minister Tony Blair officially opened the University of Teesside's new £6.5m centre for sporting excellence earlier this year.

Inside the new Olympia Building he saw some of the state-of-the-art facilities for teaching and research, including an environmental chamber to help athletes acclimatise to any environment – from -20°C to +40°.

The chamber can accommodate equipment such as a treadmill, exercise bike or wheelchair and is used by a range of athletes because it can replicate the temperature and humidity of virtually any race venue in the world, be it the intense humidity of Atlanta or the biting chill of Finland.

Among those interested in the chamber's potential is top wheelchair athlete Tanni Grey-Thompson, pictured in red. She's an honorary graduate of the University of Teesside and trains with Sarah Loughran, 19, a Media student, who suffers from spina bifida, pictured far left.

Sarah, one of the talented athletes supported by the University's Elite Athlete Bursary scheme, met Mr Blair at the official opening and spoke of her hopes to represent Great Britain at the Beijing Paralympic Games in 2008.

She believes the Olympia Building is a great asset for the region's athletes and Mr Blair said: "The facilities here are tremendous and a tribute to the ambitions of the University."

Martin Pout, a senior lecturer in Exercise Physiology, said: "The environmental chamber and exercise physiology research lab gives Teesside the cutting edge for research as well as teaching and we are talking to a number of outside bodies such as the English Institute of Sport. They are interested in utilising our facility for the acclimatisation of athletes from the region who are competing in international events overseas."

- Our picture shows Sarah Loughran inside Teesside's environmental chamber with, (from left to right) Professor Graham Henderson, Vice-Chancellor of the University of Teesside, Tony Blair and Senior Lecturer in Sport & Exercise, Martin Pout.



# £3M INNOVATION AWARD FOR TEESSIDE

The University of Teesside has secured enterprise grants worth over £3m in a competitive round of bids to the national Higher Education Innovation Fund (HEIF).



The fund's aim is to help universities work with companies and organisations to turn knowledge and ideas into new business opportunities.

The HEIF grant could not have come at a better time, explained Professor Mike Smith, the University's new Deputy Vice Chancellor for Research & Enterprise. He says: "It will play a central part in underpinning our new enterprise strategy." (See 'A strategy for enterprise' on pages 6-7)

Professor Smith said: "It's an enormous boost to receive such strong endorsement for our work from the Higher Education Funding Council for England. The grant gives us the opportunity to build some real sustainability into our work with business."

The new funds are among the biggest awarded in the higher education sector and mean that enterprise will play a strategic role in the University along with teaching and research.

Laura Woods, Director of Academic Enterprise at the University, said the funds would be used to stimulate more innovations; generate new hi-tech companies; and put new resources into key areas that can best support local companies.

Among the areas likely to benefit are manufacturing and processing, health and social enterprise. New business and technical staff will also be taken on to work with academics in developing new products and services, and in tackling business problems, added Laura.

"A major new development will be a digital Knowledge Exchange, led by Teesside, with Sunderland University as a partner," said Laura. "The Knowledge Exchange will offer a mechanism to get digital technology know-how out to industry. It will work with companies to develop advanced products and solutions and will help build the R&D base to support DigitalCity."

For more information contact Laura Woods on 01642 384412 or email [l.woods@tees.ac.uk](mailto:l.woods@tees.ac.uk)

## Leo takes over at region's FOOD TECHNOLOGY CENTRE



For Leo Guevara, his appointment as head of the Food Technology Centre at the University of Teesside continues an association with the north of England stretching over three decades. Now, he is hoping to help academics and food companies work together to develop the industry in the region.

The Centre, established in March 1999, supports small and medium-sized food and drink companies in the North East. It is financed by the European Regional Development Fund, the European Social Fund and the Department for Environment, Food and Rural Affairs.

Leo arrives having been a senior lecturer in food science at the University of Huddersfield, a technical support scientist at Lyons Patisserie, Hartlepool, part of the Allied Lyons group, and having worked on coffee research with Kraft General Foods in Banbury, Oxfordshire.

He was also an external validator to food technology and food nutrition and health courses at the University of Teesside in 1998 and a Fellow and past north of England chairman of the Institute of Food Science and Technology UK.

A graduate of the University of Leeds where he gained a PhD in food science, Leo is also fluent in French and Spanish and loves Italian food.

He says: "Universities are an asset under-used by food companies, in particular SMEs. I am looking forward to bringing the industry and academics together to collaborate in solving real problems experienced by food companies in the North East, building on the positive reputation that the Food Technology Centre enjoys."

For more information about the Food Technology Centre, call Dr Guevara on 01642 384624, email [l.v.guevara@tees.ac.uk](mailto:l.v.guevara@tees.ac.uk) or visit [www.foodtechnologycentre.com](http://www.foodtechnologycentre.com)

## What makes GOOD SMALL BUSINESSES?

A North East expert in small business development has been chosen to chair the panel of judges looking for the UK's best small businesses. Professor Ted Fuller, Professor of Entrepreneurship and Strategic Foresight with Teesside Business School, is heading the search to find the winners of the Parcellforce Worldwide Small Business Awards.



The competition, backed by the *Sunday Express* and sponsored by Viking Direct and eBay, is the biggest Small Business Awards in the UK.

There have been around 3,000 entries for the first stage and judges are in the process of inviting the best of these to make a bid for a share of £110,000 worth of prizes.

Ted says that judges will be looking for good all round small businesses.

"A good small business meets the needs of a wide range of people, including customers, staff, and of course, its owners. Making sure all relationships are working positively is top of the agenda for running any successful enterprise. So is the need to learn from experience and from what others are saying.

"Being adaptable and flexible is very important, and typical winners from previous years have real dedication to their firms, their ideas and to the people who work for them.

"Judges will also be looking for businesses that have succeeded in building a distinctive identity. They must demonstrate resilience and a determination to succeed, and be financially healthy."

# CLEANING UP

They were the industrial powerhouses that drove the North East economy for the best part of two centuries. From the early 1800s to the latter stages of the 20th century, the region's skyline was criss-crossed with pit wheels, cokework chimneys and grimy factories. But as the great plants closed, their legacy became clear, acre upon acre tainted by chemicals, dust, debris and spoil heaps.

Now, the environmental specialists have launched a project to help the North East develop its internationally recognised expertise for bringing these sites back into life for business parks, shopping complexes, housing estates and recreational areas.



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**"WE HOPE THAT THROUGH OUR WORK, WE CAN HELP RESTORE THESE OLD INDUSTRIAL SITES AND SO AID THE REGION'S ECONOMIC GROWTH"**

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Based at the University of Teesside, the team is advising companies and organisations through its Bioremediation Programme, launched earlier this year.

The timing could not be better because the Government is urging developers to use brownfield sites to protect the Green Belt, and the team is advising landowners how to use green methods such as plants and micro-organisms to break down toxic substances, rather than moving them to landfill.

A good example is the derelict land behind the Romanway Industrial Estate, which covers five acres on the edge of Bishop Auckland, County Durham. Once an enamel stonework plant, its clay pits gradually filled with ash and domestic refuse. The works closed in the mid-sixties and, although other companies have taken over the main buildings, the five acre site has remained derelict.

Today, it is leased by the Seymour Trust, a not for profit environmental organisation which hopes to create a recycling village there, including recycling centres for glass, cardboard and green waste.

The trust contracted Dr Richard Lord, pictured, project manager for the Bioremediation Programme, to advise on restoring the land.

Dr Lord said: "Sites like the one at the Romanway Industrial Estate are typical of the kind of contamination issues that owners face.

"Contamination of soils, groundwater, sediments, surface water and air with hazardous and toxic chemicals is one of the major problems facing industrial societies today and our own historic legacy might be a significant obstacle to the economic regeneration of the North East.

"We hope that through our work, we can help restore these old industrial sites and so aid the region's economic growth."

Dave Stephenson, the 50 year old former mining engineer who is operations manager for the trust, said: "There are sites like these wherever there has been industry and it is important that we find new uses for them. If we can take the correct approach through processes such as bioremediation, we can create new industries on these sites."

The Bioremediation Project is part of the University's Clean Environment Management Centre (CLEMANCE) and works with companies on environmentally friendly projects such as recycling industrial waste within the chemical industry.

**For more information contact Dr Richard Lord, Project Manager, Bioremediation, (CLEMANCE) on 01642 342408 or email [r.lord@tees.ac.uk](mailto:r.lord@tees.ac.uk)**

# NEWS EXTRA

## CASHEW NUTS AID CAR SAFETY

It may sound like one of the more unlikely scientific breakthroughs but it is true – cashew nuts are helping ensure that motorists are safer on the roads.

For Hartlepool firm Palmer UK is producing a friction powder, which is derived from Indian and Brazilian nuts and helps braking efficiency. And the University of Teesside has won international praise for providing a reliable system for testing the consistency of each batch of the product and for testing a new formulation for high temperature applications.



The system is now achieving wider fame: German car makers, who have particularly strict limits concerning vehicle braking systems, have said the University's testing procedure is superior to their own.

The testing method was devised by Dr Paul Shelton, Principal Lecturer in Materials, working with Tony Bonner, the University's Materials Suite Manager.

Kevin Palmer, a member of the Palmer family of America which runs the Hartlepool plant, visited the University with his Hartlepool managing director Douglas Brown. They attended a presentation by third year student Richard Bennett, of Billingham, who used the product as the basis of his final year project.

Paula Henderson, Quality Manager of Palmer UK, part of Palmer International, pictured with Dr Shelton, said: "Oil is taken from the cashew nut shells and we add various chemicals to turn it from a liquid into solid particles and we grind them to whatever size our customers want.

"This friction material is supplied to brake pad manufacturers throughout the world, who use it for brake linings and pads, occasionally putting it into clutch linings."

Paula is delighted with the way Palmer UK and the University have co-operated on the testing.

She said: "We have worked extremely well together and the University has even made sure our computers are right for the task in hand. I'm sure this relationship and co-operation will be developed further."

**For more information about industrial expertise within the University of Teesside, please contact Dr Tammy Long, Knowledge Transfer Manager, on 01642 384406 or email [tammy.long@tees.ac.uk](mailto:tammy.long@tees.ac.uk)**

## MANAGING CHANGE



Companies in the North East are increasingly turning to expertise in universities, particularly business schools, to help them manage organisational change in today's frantic world.

One such company is Cramlington-based Jackel Limited, part of the baby products division of Mayborn Group plc, whose brands include Maws and Tommee Tippee.

Alison Pearce, the company's Head of Innovation and Business Development, led a team to spearhead change throughout the organisation. She said: "The main catalyst for change is the relentless developments in information and communications technology and the new opportunities to meet the needs of customers in different ways."

Professor Paul Iles, pictured, head of the Centre for Leadership and Organisational Change and Professor David Preece, an expert in organisational change and technology management, developed a project brief in consultation with Alison. She wanted the team to be agents of change and said: "No area of the business was exempt from review, and I am very pleased with the work we have been doing with Teesside Business School and look forward to the implementation of this programme of change management."

**For more information about Teesside Business School's consultancy and training activities, contact Fiona McQuillan, Commercial and European Projects Manager on 01642 342863 or email [f.mcquillan@tees.ac.uk](mailto:f.mcquillan@tees.ac.uk)**

## CRAIG HITS THE BIG SCREEN

Enterprising Teessider Craig Hornby has hit the big screen with his cinematic story of the iron stone miners – the men who turned the Eston Hills into England's answer to the Gold Rush.

The two-hour 'docu-drama' produced by Craig's Pancrack Pictures company has drawn huge audiences across the region since his premiere at the Eston Miners' Institute in February, when 400 turned up to see 'A Century in Stone'.

Craig was awarded a £75,000 fellowship from the National Endowment for Science, Technology and the Arts (NESTA) to make the film, which used long-forgotten local film footage of the mines and steelworks held in the Northern Region Film and Television Archive, maintained at the University of Teesside. The Virtual Reality Centre also helped by enabling Craig to recreate fascinating underground mining scenes.

# Open your mind



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**UNIVERSITY OF  
TEESSIDE**  
MIDDLESBROUGH TEES VALLEY TS1 3BA UK  
TEL: 01642 218121 FAX: 01642 342067  
[www.tees.ac.uk](http://www.tees.ac.uk)