The Big Question

How can we combat a global obesity crisis?
The Centre for Mobility and Transport takes a fresh approach to the challenges facing society by bringing together world-class experts from art and design, engineering and computer systems.

PhD students within the centre work with some of the major organisations in these sectors on a range of real-life issues facing businesses today.

This is a fast-paced, exciting area of development where new opportunities and areas for research collaborations are constantly arising.

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Welcome

I’m learning so much about the excellent research and innovation that is carried out here and meeting passionate and hardworking staff who are hugely invested in what they do.

This issue of Innovate will give you a glimpse inside the life-changing research carried out here and demonstrate the benefits we bring through our collaboration with business.

The magazine is packed with stories about the way we consult with a range of companies, public sector bodies and government agencies. We have updates from our research centres and news from campus. Professor Alfonso Jimenez, from the Centre for Research in Applied Biological and Exercise Sciences tackles the ‘Big Question’ about how we can combat a global obesity crisis. His team of expert researchers are well-placed to educate, inform and empower people to take control of this issue.

You’ll also be able to read about Coventry’s strong focus on the future of research and why we’re investing in our hugely talented PhD students. Find out why they wanted to study a PhD at Coventry University and the range of fascinating topics they are researching.

From mango production in the Philippines to rehabilitating offenders in a Midlands prison, you can read about the difference our research is making all across the world.

The range of stories in this issue shows the depth and breadth of our expertise. As a University we’re determined to play our part in shaping the future.

Professor Richard Dashwood
Deputy Vice-Chancellor for Research

New driving force behind research at Coventry University

Professor Richard Dashwood joined Coventry University to take the lead on our exciting and wide-ranging research portfolio. Taking up the post of Deputy Vice-Chancellor for Research, Professor Richard Dashwood joins us from Warwick Manufacturing Group (WMG) at the University of Warwick. Richard was formerly Academic Director, Head of Engineering Materials and Manufacturing, and Chief Technical Officer of the High Value Manufacturing Catapult.

He started his career at Imperial College London where he spent nineteen years as a researcher and academic in the Department of Materials.

He brings with him a wealth of experience spearheading high-profile research programmes and will be responsible for overseeing all aspects of Coventry University’s ambitious research strategy.

Richard replaced Professor Kevin Warwick, who retired at the end of March 2016. Professor Dashwood will move Coventry into the next phase of its research strategy.

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A team of researchers led by Professor Paul Bywaters at Coventry University has conducted a widespread review into the relationship between poverty, child abuse and neglect.

Funded by the Joseph Rowntree Foundation and the Nuffield Foundation, the report explores the childhood causes and adult consequences of child abuse and neglect and outlines broad policy implications, with a particular focus on the UK.

Paul explained: “According to the NSPCC’s summary of official UK data in 2012/13, more than 60,000 children were placed on a child protection register but no official data is available for the number of such children who were living in poverty. It’s hard to believe that there have been no substantial research studies linking the socio-economic circumstances of individual families to the incidence of child abuse and neglect in the UK in the past 25 years.”

Following extensive and detailed reviews of the evidence available, Paul and his team have drawn three main conclusions in the report:

1. There is a lack of joined up thinking and action about poverty and child abuse and neglect in the UK.

2. The UK evidence base is limited, both in terms of official data and research.

3. A decline in family poverty is likely to have a positive effect on reducing both the extent and severity of child abuse and neglect in childhood and so reducing the effects into adult life.

“We can draw consequences between other developed countries and the UK to demonstrate that there is a strong association between families’ socio-economic circumstances and the chances that their children will experience child abuse and neglect.

The reasons behind this can be ‘direct’ through lack of money for the basics such as food, housing and heating, or to buy-in support, or ‘indirect’ through parental stress and neighbourhood conditions.”

Following the creation of this report it is hoped that the outcome will help influence governments, service providers and practitioners to make addressing family poverty a central issue in child protection and encourage policy-makers to commission further research into this complex relationship.
A Coventry University-led study has used an innovative healthcare technology system to expose a worrying trend at the heart of UK care homes.

Researchers from the University’s Centre for Technology Enabled Health Research have been able to show that the prescribing of potentially dangerous antipsychotic drugs to dementia patients in UK care homes did not decrease between 2009 and 2012, despite warnings from the government.

Data analysed by the University’s academics, with the help of a unique digital medication management system developed by Bristol-based Invatech Health, painted an alarming picture – that antipsychotic prescribing rates over the four year period were not only maintained, but that the length of treatment was ‘excessive’ in over 77% of cases.

The Department of Health’s 2009 National Dementia Strategy recommended a review of the use of antipsychotics – often referred to as the ‘chemical cosh’ owing to their subduing effect on patients – in light of potential serious side effects, which include increased risk of death. According to Coventry’s researchers, however, the message has yet to filter through.

“There appears to be a lack of systematic monitoring of prescribing data in care homes,” explains Professor Ala Szczepura, who led the study and whose findings were published in the prestigious BMJ Open journal. “We’ve identified not only a failure of the National Dementia Strategy to produce a sustained decrease in the use of antipsychotics, we’ve also shown large regional variations in prescribing rates, including evidence that their use is higher in care homes in deprived neighbourhoods.”

Indeed, the research highlighted that care homes in the highest prescribing 20% are more likely to be located in a deprived area, and those in the lowest prescribing 20% are more likely to be served by a single GP practice – an important finding which could indicate that those homes in the lowest quintile benefit from a consistent message that is absent from homes served by multiple practices.

The study – which was a collaboration between Coventry University, University of Warwick, Lancaster University, University of East Anglia, City, University of London, and Invatech Health – also indicated that older first-generation antipsychotics such as haloperidol and chlorpromazine are still being used extensively, with no measurable shift to safer second-generation antipsychotics like risperidone – as recommended in the National Dementia Strategy.

What, then, is the next step in tackling this issue that is blighting many care homes in the UK?

“Looking forward,” says Professor Szczepura, “the Prime Minister’s Challenge on Dementia 2020 aims to further slash inappropriate prescribing of antipsychotics by 67%, and reduce variation across the country. This would be an extremely positive step, but it’s clear from our research that to achieve this in care homes, a significant change is required in prescription culture and the management of vulnerable people with dementia. Neither represents an insurmountable challenge, but it will require a concerted and joined-up effort from both the government and all those involved with long-term residential care.”

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Research supports the UK automotive industry revival

Report produced for the Department for Business, Energy and Industrial Strategy identifies investment potential to build on the UK’s automotive industry renaissance.

In 2016, UK car production reached a 17 year high. Further announcements of major UK investment by vehicle producers have hit the headlines in recent months. The industry is critical to both the future prosperity of Coventry and to the success of the ‘Midlands Engine for Growth’.

However, lower cost locations for vehicle production have continued to come on stream globally, signalling a need for new investment in research, development and design to secure the UK’s stake in producing the next generation of road vehicles and the technologies underpinning them.

In 2016 Dr Nick Henry, Co-Director, Dr David Jarvis, Reader in Local and Regional Economic Development and Dr Andrew Jones, Research Assistant, from the University’s Centre for Business in Society were commissioned to complete a report in collaboration with ICF International for the then named Department of Business, Innovation and Skills (BIS). The study identified international technology trends in major competitor economies and, based on key informants’ views, provided an understanding of global market drivers, competitive positions and international specialisation in R&D to inform proposals for further UK investment.

Through a process of key stakeholder engagement with major manufacturers, suppliers and research organisations, the report re-affirmed the key automotive technology roadmaps and strategic technologies identified through ‘Driving Success’, the previous government’s industrial strategy for the automotive sector.

In addition, the report mapped UK automotive R&D activity framed by the strategic technologies, and provided a range of data on current and recently announced activity.

An international evidence base for potential investment choices was developed by reviewing international automotive R&D research in Germany, Japan, South Korea and the USA against the UK technology roadmaps.

Supported by this evidence base, the report’s recommendations on future investment are now being taken forward by the automotive unit of the Department of Business, Energy and Industrial Strategy (BEIS).
Award-winning research shows health benefits of gardening

Biomechanics experts from Coventry University have been demonstrating the health benefits of gardening at the Chelsea Flower Show.

Experts used unique motion capture technology which – when users don a Lycra suit fitted with sensors – shows the body’s movements live as an on-screen avatar, which is then turned into a skeletal animation complete with muscles, joints, and the forces going through them.

Coventry’s high-tech kit – which is similar to gadgetry used in Hollywood - is being used as part of a collaboration with the Royal Horticultural Society (RHS) to identify which tools and methods are most effective in helping gardeners to improve their health.

Following their 2016 exhibition at the Chelsea Flower Show, the team was awarded a coveted accolade by the event’s judges. The University received a bronze medal in the ‘Discovery’ category, which focuses on the science behind horticultural. The RHS judges were not the only ones wowed by what they saw – academics Dr James Shippen and Dr Barbara May also met Her Majesty the Queen, HRH the Duke of Edinburgh and HRH the Princess Royal.

Dr Shippen, from the University’s Centre for Mobility and Transport, said: “It’s a great honour to have been recognised by the Royal Horticultural Society’s judges.”

University sets out to tackle UK shortage of engineers

A new course to boost numbers of qualified engineers has been designed for people who have never considered a career in engineering.

Demand for graduates in engineering, data science, cybersecurity, and software engineering is growing in the economy. The MSc Digital Technology for Engineering course, funded by the Higher Education Funding Council for England (HEFCE), is aimed at tackling the national shortage of engineers in the UK.

Providing graduates in other subjects with the opportunity to study and work in these growth areas will allow them to develop their careers, and increase the supply of skilled practitioners. The course will provide a range of opportunities for graduates to convert to these subjects, while undertaking study delivered in a variety of different models.

Phil Lewis, Senior Lecturer, has helped design the new MSc, he said: “We’ve drawn expertise from colleagues in engineering, computing, maths, electronics and manufacturing to provide a really comprehensive package that is focused on filling specific emerging skills gaps. The course is scheduled to begin in September 2017 and is already attracting interest from both the UK and overseas.”

Contact philip.lewis@coventry.ac.uk for more information.
Testing facility for connected and automated driving, which will create or safeguard jobs, is to be set up in the heart of the West Midlands.

The testing facility has been funded through a multimillion pound grant from the UK’s innovation agency, Innovate UK. It will bring together academics from Coventry University’s Research Centre for Mobility and Transport and a number of high profile external partners.

This £5.6 million injection will fund the UK Connected Intelligent Transport Environment UK CITE project which will assess connected and automotive vehicles on 41 miles of five different road types and junctions in the Midlands. The aim is to explore how different communication technologies can be used to better inform drivers and enable the next generation of automated vehicle systems with the ultimate goal of improving safety and reducing congestion.

The research will focus on human factors and traffic modelling. Dr Cyriel Diels, human factors researcher said: “The benefits of these technologies will only materialise if these systems are designed in such a way that people are not only able and willing to use them, but also respond to them as intended. We will investigate this in our new driving simulator facility which will allow us to systematically explore the different factors that will affect drivers’ behaviour and technology acceptance.”

Dr Olivier Haas, principal investigator, continued: “A better understanding of how these systems impact drivers’ behaviour will also allow us to refine driver models used in traffic simulators to improve accuracy, and predict the effects connected and automated vehicle technology can have on our roads.”

Dr Olivier Haas, principal investigator, continued: “A better understanding of how these systems impact drivers’ behaviour will also allow us to refine driver models used in traffic simulators to improve accuracy, and predict the effects connected and automated vehicle technology can have on our roads.”

The Research Centre for Mobility and Transport will support automotive engineering and research specialists HORIBA MIRA to develop simulation models to investigate the impact of the wider take-up of this technology on drivers, infrastructure capacity, safety and cyber-security.

As well as performing real-life tests, the results of this pilot scheme will be used to model the impacts of wider public and commercial take-up and give recommendations on future transport and communications infrastructure to planners and industry. It will also provide valuable data to support and encourage further research and design in the UK.

This realistic research platform will provide the means to speed up the deployment of a connected and cooperative traffic environment. Connected and automated cars could be on trial in Coventry and Warwickshire over the next 12 months.

The UK CITE project, led by Jaguar Land Rover and Visteon, will also include HORIBA MIRA, Siemens, Vodafone, WMG, University of Warwick, and Coventry City Council, supported by the Coventry and Warwickshire Local Enterprise Partnership (CWLEP).
Access to state-of-the-art development and testing to reduce costs for SMEs

A European-funded project, led by Coventry University, to support small-to-medium sized enterprises in the West Midlands has helped more than 700 businesses access sustainable and green technologies.

The project, called Sustainable Building Futures (SBF), also helped create and safeguard more than 40 jobs, delivered 120 workshops, events and short courses, organised 75 graduate placements and created an additional ten new start-up businesses in the region.

The project was designed to help SMEs grow and expand their business and reduce costs associated with developing and testing environmental products.

SMEs were able to access the state-of-the-art facilities within the University including its environmental chamber for testing building products, air tightness and how much uncontrolled ventilation there is in buildings. Thermal imaging capabilities will also be made available to show where heat is leaking from buildings, as well as energy audits to help streamline processes and save money.

Despite the project coming to an end in 2015, the support for business has been continued through the Faculty of Engineering, Environment and Computing.

Extraglaze is just one of the hundreds of businesses the project supported.

Company Director Nic Irvine said: “Before we accessed the support from SBF we had no scientific data to help ‘sell’ our products. Now we have the confidence and the evidence to talk - with authority - about the quality of our glazing.

“Working with SBF gave us the scientific evidence we needed to be seen as credible in the industry. The support has been invaluable and has really helped move our business forward.”

Need help exploring a new innovation or solution to your business problem? Visit: www.coventry.ac.uk/research/partnering-with-us
From Berlin to Britain: on a quest for culture

Aurelie’s journey started with an undergraduate degree in British Cultural Studies, as well as social theory and anthropology, in Bochum, Germany. ‘The German higher education system used to be very different to that of the UK, so it was the norm for everyone to follow their degree with a Masters. I loved cultural studies and progressed to a Masters studying just that, focusing in particular on British politics, economics and social affairs.’

‘The course at Humboldt University in Berlin only had 20 places but attracted an interesting group of students from all over the world. Studying alongside people from China, Poland, Italy and Bulgaria, and other places, was an enriching experience.’

As part of her Masters course, Aurelie received funding to travel to London and complete an internship at the British Council. She was offered a job as a researcher for the British Council during her studies and finalised her thesis whilst in London; her first experience of studying alongside full-time work. In 2009, Aurelie joined a social policy consultancy team, iCoCo, then based at Coventry University.

German-born Aurelie Broeckerhoff has always had a passion for ‘everyday culture’ and people’s experiences of cultural diversity. It is a passion that’s directed her studies and her career over the past few years; eventually leading to a part-time PhD at Coventry University.

Making a difference

‘I was attracted to work in social policy, first internationally at the British Council and then at the University because it allowed me to understand how the theories I had learnt about could be applied to address real policy concerns. I was attracted to the flexibility this kind of research offered, and being encouraged to find new routes and innovation. I wasn’t expected to follow long-standing traditions or be restricted by the thoughts of one particular academic or way of thinking. Working for the Centre for Trust, Peace and Social Relations, I am still able to carry out socially relevant research, which can make a real difference beyond academic circles in people’s daily lives. I hope to make a contribution to society through my research.’
As a full-time researcher, a PhD wasn’t something that Aurelie had really considered. ‘I didn’t want to succumb to the feeling of needing a doctorate to be taken seriously in my job. I wanted to study for me.’

The turning point

The turning point for Aurelie was finding a topic that truly inspired her. By working alongside colleagues in the Centre for Business in Society and the marketing department, her idea crystallised. Her PhD focuses on how people living in multicultural neighbourhoods respond to fast paced gentrification, focusing in particular on changes and interactions with and in the high street. Professor of Marketing, Marylyn Carrigan, is Aurelie’s Director of Studies.

‘I like seeing how the research - and I - have evolved over time. I am almost at the end of year four of a five year programme, and already I love the positive effects it brings to my day job. It’s hard work and it can be exhausting but it is so rewarding. It has also helped me grow personally.’

Aurelie finds the flexibility she experiences within the Centre for Trust, Peace and Social Relations helps with managing her time between study and work, but admits there are times when juggling different demands can feel overwhelming.

‘I have such a supportive team helping me on my PhD and that is essential to succeed. I’m in the middle of my fieldwork so it’s a really exciting time in the project. It’s not something that you can enter into lightly, but it’s a very exciting journey.’

‘I am still able to carry out socially relevant research, which can make a real difference beyond academic circles in people’s daily lives’
As demand for zero-emission transport rises and concerns for urban air quality become more acute, car makers around the world are increasingly focusing attention on clean technologies and their sustainability.

Richard Stocker’s PhD studentship is investigating the effects of ageing on the battery packs used in electric cars – specifically how they age, the factors influencing the nature and speed of the ageing, and what the implications are for a battery’s usable lifetime and performance. The aim of Richard’s research is to establish a model by which the lifetime power of a given battery pack in certain conditions could be estimated, providing automotive manufacturers with a knowledge-base to inform decisions around how to integrate a battery pack into their designs for best performance, efficiency, and longevity.

“The knowledge and skills that are associated with Coventry’s academic expertise can achieve a useful purpose when harnessed by a company like HORIBA MIRA and its advanced testing facilities.”

In the 21st century, it’s not only the type of vehicle we are buying that is different – it’s also the way that we are buying it.

The changing shape of the automotive customer journey is a central theme in PhD student Milena Kukova’s research, which is exploring which automotive product attributes (from design to environmental credentials) are associated most closely with different consumer groups and vehicle types, and which attributes are more likely to influence the choices and expectations of consumers.

“Understanding how consumers’ expectations shift, and what they want from a new generation of vehicles, is absolutely fundamental to attracting and retaining customers,” said Milena. Through her PhD she is aiming to advance understanding in this area by investigating consumers’ psychological and behavioural responses to certain attributes.

“I’m aiming to develop a vehicle evaluation model which would capture the value and significance of those attributes,” she said. “Ultimately this could be used by HORIBA MIRA and its automotive industry partners in the process of taking a product to market.”
A wide-ranging doctoral research collaboration between Coventry University and automotive engineering and research specialist HORIBA MIRA is exploring technologies which make journeys in vehicles safer, cleaner, smarter and rewarding.

Vehicle design and engineering is about more than just the looks and how a car handles on the open road, which is why manufacturers invest huge amounts into striking the right balance between weight saving and the crashworthiness of their cars.

Structural optimisation is the key, and it is the focus of Alexis Wilson’s PhD studentship with HORIBA MIRA. Far from being a simple case of finding an agreeable compromise between weight and crash impact, Alexis’s research is exploring optimisation algorithms which take into consideration the different behaviour patterns in vehicle structures – for example how different parts of a car need to crumple in different ways to protect its occupants, and how the use of multiple materials affects the process.

Alexis is aiming to challenge the process of vehicle design by providing a way to meet several design requirements in one unique process. He believes that the HORIBA MIRA and Coventry collaboration is “key to achieving impact in research, which in turn benefits the scientific community and by extension society itself.”

Building on the long-standing ties between the University and HORIBA MIRA, the joint initiative aims to progress knowledge, skills and innovation in a range of key technical and conceptual areas – from automotive cyber security to user-centred design – each of which is benefiting from a focused PhD research studentship.

Coventry’s research students are integrated into HORIBA MIRA’s structure and culture, creating an environment in which they can take advantage of the latest industry resources while embracing the academic integrity and the freedom to explore new ideas which are a key part of PhD study. The unique opportunities presented by this industrial PhD link-up are set to help HORIBA MIRA to develop new technologies which can be exploited by the organisation to advance its own long-term research aims.

Read on to find out more about the collaboration’s key research themes, and how Coventry’s talented doctoral students are making a difference in their specialist areas.

In terms of impact and making a contribution to the automotive industry, the Coventry University and HORIBA MIRA collaboration is perfect,” said Maciej. “At Coventry we’re able to access all the University’s academic resources and scientific databases, and through HORIBA MIRA we benefit from vehicles, laboratories, a proving ground and all the company’s industrial expertise.”
How can we combat the global obesity crisis?

We’re facing an obesity time-bomb. If we don’t act now, predictions are that more than half the UK could be obese by 2030.

Professor Alfonso Jimenez is a man with a mission – a mission to get people moving. His passion for promoting an active lifestyle has become the focus of his research and he’s using that focus to try to counteract the obesity crisis. Read his views on the issue of obesity and what the Centre for Applied Biological and Exercise Sciences is doing to help combat it.

What's the problem?

The problem is an obesity epidemic. According to the World Health Organisation, worldwide obesity has more than doubled since 1980. In 2014, more than 1.9 billion adults were overweight and of these over 600 million were obese. These figures might be hard to absorb, but that's the equivalent of the population of China – imagine an entire country, as vast as China, made up of overweight and obese people. It's an incredible statistic – and alarmingly true.

How has this happened?

This is not something that has happened overnight and it is not rocket science. Obesity and being overweight is caused by eating too many calories and moving less.

Let's look at our food first. Over the past 60 years, the world has got faster. Our ability to bring cheap and disposable foods to the wider population has become efficient and streamlined. Unhealthy and energy-dense foods that are high in fat are easy to access and extremely cheap. The world’s population is killing itself by not managing its food more successfully. I’m not saying that food is our enemy; it’s more about the availability and affordability of the wrong types of food.

Obesity was once considered a problem only faced by developed countries with high incomes, but the reality is that being overweight and obesity are now on the rise in low and middle-income countries. In developing countries, the rates of increase of childhood overweight and obesity has been more than 30% higher than that of developed countries.

The second major factor here is physical inactivity. We’ve become lazy. We move less. This sedentary lifestyle has been caused by many things: changes to the type of work we do, new modes of accessible and affordable transport and the increase in people living in urban areas. Humans are not ready to be sedentary. Our genes are designed to save energy and our ability to store energy gets better with age. Humans have a natural ability to move and this is closely linked with our cognitive performance. Being physically active has a positive impact on our emotional and social wellbeing and provides opportunities to interact with others.

What’s the potential damage if we don’t act now?

We’re facing an obesity time-bomb. If we don’t act now, predictions are that more than half the UK could be obese by 2030. Physical inactivity is already costing the UK £20 billion (the EU Commission has recognised that the cost of inactivity in Europe is more than 80 billion euros per year), who knows what that figure will rise to if we don’t take action now.

Being overweight or obese is linked to more deaths worldwide than deaths caused by being underweight. Cardiovascular diseases, cancers, chronic respiratory diseases and type-2-diabetes represent a leading threat to human health and development. These four diseases are the world’s biggest killers, causing an estimated 35 million deaths each year - 60% of all deaths globally.

As we all know, these diseases are largely preventable. According to the World Health Organisation, up to 80% of heart disease, stroke, and type-2-diabetes and over a third of cancers could be prevented by eliminating lifestyle risk factors, mainly tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol. >>
Physical inactivity is costing the UK £20 billion a year
becoming more extreme. Exercise fanatics are becoming more fanatical and the inactive people are becoming even less active. Obesity is socially unacceptable but the reality is that these people need the support of society to become more active. A positive social message about activity will be much more impactful than the damaging scrutiny people are under now.

Getting people to enjoy being more active is the most cost effective way to tackle this obesity crisis. We’re working with a range of global partners on different ways to help people enjoy exercise and see exercise as part of the treatment of obesity rather than prevention.

Obesity is socially unacceptable but the reality is that these people need the support of society to become more active.

<< Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. Obese children also experience breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular disease, insulin resistance and serious psychological effects.

Socially, we’re not an accepting society when it comes to being overweight and obese. There are social stigmas and body image is highly scrutinised in the media – it’s not cool to be overweight, but equally it’s not healthy to be obsessed with exercise. It’s abundantly clear that the two extremes of the spectrum are
The Centre for Research in Applied Biological and Exercise Sciences (ABES) aims to enhance Coventry University’s reputation for scientific research of excellent quality, across a range of areas and discipline boundaries, to create a continuum of expertise covering three key themes:

- Cellular and Molecular Biosciences. We characterise and manipulate key cellular and molecular systems which underlie normal and pathological cell function.

- Biological Systems, Health and Disease. Systemic processes reflect an integration of genetic, infectious, toxic, ischaemic, and metabolic insults in acute and chronic disease. We undertake research which has the potential to profoundly alter approaches to disease prevention, diagnosis, and treatment.

- Physical Activity, Exercise and Obesity. We research the factors that influence physical activity, exercise and obesity, in children and older adults, to improve function, health and wellbeing. This work develops and delivers interventions that are intended to increase longevity and reduce ill health.

The work of the Centre is also evolving. To support the existing expertise a number of key appointments have been made.

- Joining the team is **Professor Robert Thomas** - a Consultant Oncologist at Bedford and Addenbrooke’s Hospitals in Cambridgeshire. He leads a busy cancer unit specialising in breast, bowel and urological cancers using chemotherapy, radiotherapy, hormones and biological therapies. He also heads an active research unit recruiting high patient numbers into national studies investigating new therapeutic initiatives. In addition, his research unit is specialising in the design of trials investigating the benefits of nutritional and exercise interventions for people living beyond cancer.

- **Professor Jaime Lissavetzky** is a former public servant from Spain and has a successful political career. His work over the years has earned him some significant honorary awards and decorations, amongst others: Gold Medal from the Royal Order of Sporting Merit; 2005 Fair Play Trophy from the International Olympic Committee, Medal from the Spanish Olympic Committee; Gold and Diamond Medal from the General Sports Mutual Society and the French Order of the Legion of Honour. Professor Lissavetzky has recently been appointed as Director of the Centre for Sports Studies at Universidad Rey Juan Carlos (second biggest public university in Madrid), from where he will lead a number of strategic projects and actions regarding sports development, education and public health impact, both at national and international levels.

- **Dr. Steve Mann**, Director of Research at ukactive has been appointed as a Senior Research Fellow within ABES. As part of this strategic partnership with ukactive, we are running three ground breaking PhD projects in the area of Active Living (cardio-respiratory fitness testing in schools, a national data base of exercise referral programmes, and a disruptive model to increase adoption and retention for the physical activity sector).

- **Prof Mike Duncan** has been awarded a British Academy/Leverhulme grant in collaboration with Dr. Emma Eyre and Anna Cunningham (Psychology, Behaviour and Achievement). The project examines the potential of story-based movement interventions to enhance movement, competence and academic ability in pre-schoolers.

- **ABES appointed Dr Martin Weickert of UHCW as a visiting professor.** Prof Weickert is the regional coordinator of patients with neuroendocrine tumours (NET’s) and we are currently planning a PhD project around this patient cohort to begin early 2017.

- **Prof Derek Renshaw** is leading an innovative joint-research collaboration with Dr Theo Nell from Stellenbosch University in South Africa exploring inflammation and metabolic disease.

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More than 40 years after launching the UK’s first undergraduate course in automotive design, budding motoring designers and transport industry professionals are being given a boost by the University to map out their future careers and drive growth.

Set to open in May 2017, the multi-million pound centre of design excellence will support UK innovation in the transport industry and provide greater opportunities for designers to join the automotive, aerospace, rail and marine worlds.

Mobility and Transport were able to predict where future shortfalls in the graduate talent pool may fall – with evidence from industry experts suggesting one area that has seen a reduction in talent and job applications being clay modelling.

Work has started on the build for the new centre at Coventry University’s Technology

Transforming transport design
Park. State-of-the-art features of the new design hub have been chosen after consultation with influential figures from across the transport industry to ensure the future needs of the sector are met. These include a six metre long interactive power wall, bringing detailed designs and engineering concepts to life using virtual reality and, for those wanting an even more hands-on experience of design, the centre will have advanced clay milling facilities for the creation of physical models.

David Wright, director of strategic initiatives at Coventry University, said: “Our aim with the National Transport Design Centre is to meet the demand for specialised skills in transport design and to build on Coventry University’s existing expertise in this field. Not only that, but we’ll be ensuring the centre is ‘open for business’ for companies in the transport sector – whether automotive, rail, aerospace or marine – to work with us to help them grow.”

The centre is set to address many recommendations from across the industry, including those referenced in the Automotive Council report. Key areas of focus will include postgraduate education in transport design, research projects in collaboration with industry, and support for the UK’s high-value manufacturing sector and its supply chain to improve design capability.

Researchers with the University’s Centre for Mobility and Transport were able to predict where future shortfalls in the graduate talent pool may fall

To maximise its effectiveness it will function in a cross-disciplinary way, bringing designers, technologists and coders, together with artists, gamers, material specialists and fashion experts.

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**Automating and streamlining mango processing leads to job creation and increasing social wealth.**

Mangos are big business in the Philippines. The country produces more than one million tonnes of mangos each year and the industry supports around 2.5 million farmers. Mango production contributes more than $60 million dollars to the country’s export economy.*

The mango processing industries only use about half of the mango fruit, with the remainder being discarded as waste. The mango waste is disposed of in dumpsites and left to rot causing unpleasant odours and potentially hazardous liquids. Local people often scavenge in the dumpsites causing a potential health risk to the population.

In 2012, a start-up company was formed out of the University of San Carlos. The company, called GEM, converts mango waste into useful products using technology developed by the university. They use all of the mango waste including peels, seed husk and seed kernel and put it through a drying and separating process to convert the waste into food products such as mango flour and mango tea. The process leaves no waste at all.

**Maximising margins**

Professor Elena Gaura, who has been leading on the project explained: ‘The process for separating the mango waste and turning it into useable by-products was hugely labour-intensive, driven by human operators, qualitative process control and involving hazardous working conditions for the labourers. There are also inherently small margins within this industry so any cost-savings on production have a hugely beneficial impact on profits.’

‘Myself and the team from the University’s Centre for Flow Measurement and Fluid Mechanics knew we could offer a solution. We met with colleagues at the University of San Carlos to talk through ways we could employ our expertise in wireless sensor and actuators networks to make the processes within the factory automated and streamlined. Embedding the new technology would help the business to improve efficiency, increase capacity, create an up-skilled workforce and allow the business to grow.’

A team of researchers from the Centre spent time sampling and analysing various production stages within the factory; monitoring ovens and solar drying facilities to scope out the optimal opportunities for automation.

A full end-to-end, bespoke Wireless Sensor Network (WSN) environmental monitoring system has been developed and deployed, targeted at monitoring temperature, relative humidity, air flow and radiant temperatures in the drying environments (solar dryer and tunnel dryer).

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*http://business.inquirer.net/169739/mango-farming-for-profit-and-environmental-preservation
The data gathered by the networks helps the researchers understand the drying process, produce predictive drying models and further improve the design of the equipment and automated systems to achieve high productivity and make the process more cost-efficient.

**Improving efficiency**

The results have been impressive. In just 12 months, the factory is already more efficient.

Elena continued: ‘Local people who are now working within the factory helping to turn the mango waste into profitable goods also benefit from a range of social and educational services for themselves and their families – including housing, schooling and childcare facilities – all associated with GEM. The factory currently only takes waste from one of 36 plants in the region so the potential for up-scaling this work is huge.’

Elena and her team are also working closely with academics at the University of San Carlos to build a stronger research and skill base in the Internet of Things – the wider umbrella for wireless sensor and actuator networks.

Coventry University has provided USC and other Filipino universities with annual summer schools on wireless sensing and the Internet of Things, aimed at masters, PhD students, and staff members, in 2015 and 2016.

Elena continued: ‘We’re also keen to ensure the success of this project will inspire other Filipino industries to make greater use of their academic institutions as a source of technological advancement.’

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*The Philippines-UK collaborative Partnership-SYSTEM for Environmental and Efficient Drying (PULP-SEED) is a British Council Newton Fund Institutional Link between Coventry University and the University of San Carlos (USC), Philippines. The Newton Fund is part of the UK’s official development assistance programme and this individual project is worth more than £400k over two years.*
A unique programme which supports parents and caregivers of children on the autistic spectrum has been given a cash boost of £10,000 from the Big Lottery Awards for All scheme.

The ‘Help to Overcome Problems Effectively’ (or HOPE for short) course is an autism self-management programme which uses principles of health psychology and positive psychology theory to look after the wellbeing of those in a caring role.

HOPE was developed by a duo of leading health experts at Coventry University – health psychologist Professor Andy Turner and research fellow Dave McHattie – in collaboration with two local parents, Tina Malin and Wendy Dingley, Andy met Tina and Wendy – both parents of children on the spectrum – when they attended the first such HOPE course for caregivers of kids with autism. It was their life stories which inspired and shaped the development of the HOPE programme for parents, which is based on an earlier course set up to support people living with a long-term condition.

It is already anticipated that the lottery funding will provide a valuable boost to the profile of the programme and the community interest company ‘HOPE 4 the Community’, which was established by Andy, Dave, Tina, Wendy and Vicky Harker – with the support of Coventry University’s social enterprise team – to run the self-management scheme. Over 250 parents in the city have already benefited from the programme, and Andy and his team hope to grow those numbers over the next year.

So how does the HOPE programme work? The activities we run through the courses are designed to create an upward spiral of positive emotions,” explains Andy. “This leads to improved confidence, resilience and happiness, and reduced feelings of depression and anxiety – and it’s all underpinned by evidence-based activities such as goal setting, action planning, mindfulness and gratitude diaries.”

The tutors’ own personal experience is also a key factor in the success of the programme to date.

“It’s one of the unique elements of HOPE that the tutors are able to truly empathise with parents and carers they’re supporting,” says Wendy. “Very often participants comment on how refreshing it is to have a programme where the tutor understands the real problems, and they haven’t just read it from a book.”

The tutors’ own personal experience is also a key factor in the success of the programme to date.

“The primary thing participants take away from the HOPE programme is the understanding that they are not alone; that the feelings they experience are normal for a parent or carer in these situations. Very often when people attend our programme they have been so busy concentrating on their child or family that they’ve forgotten how to be kind to themselves. By the end of the six weeks they have started to remember what it is like to have fun and make time for themselves. Andy’s research has shown that after attending the course, the parents’ mental wellbeing is greatly improved and they are less depressed and anxious. Many of the past participants of the programme still meet up on a regular basis, even years later. They make such strong bonds through HOPE that they wouldn’t want to lose the support of others.”

The team behind HOPE has ambitious plans for the future of the programme, and the Big Lottery Awards for All funding is set to help make them a reality.

An official launch event for the course took place in November, and now training for several more parent facilitators is underway to enable the programme to be delivered in areas outside of Coventry. And the next significant step will be the development of a web-based version of the HOPE programme, meaning parents across the UK can get involved.

“I’m incredibly proud of the development of this work,” says Andy. “The passion and commitment that Tina and Wendy bring to the programme are one of the reasons it has been so successful. I’m born and bred locally, and did my undergraduate degree and PhD at Coventry University, and to be able to use my academic career to provide tangible benefits to parents within this city and beyond makes me hugely proud.”

The programme for parents and carers is targeted to help them develop tools and understanding in areas such as coping with stress, anger (both in themselves and with the child) and behavioural issues – each of which is a significant part of living with autism. According to Tina, the sense of a shared experience with others is one of the main reasons the course works so well.

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The future of the lion

For lion populations to succeed, local communities must have incentives to conserve them.
In addition, wild lions are being squeezed into evermore fragmented populations where in-breeding can negatively impact the gene pool, whilst endemic and epidemic diseases affecting lions are also taking their toll. These increasingly isolated populations are becoming even more vulnerable to disease, the impact of climate change and unsustainable hunting practices.

ALERT and Coventry University have teamed up to address a significant case of human-lion conflict in Zimbabwe. Inspired by the successful work of Kenyan Richard Turere, motion triggered solar light deterrents have been installed on kraal walls to prevent nocturnal assaults on livestock. Strategically placed camera-traps film any lions lurking around the kraals at night to identify their behaviour. So far, these lights are successfully keeping lions away from communities and their kraals. Coupled with a conservation education programme implemented in the affected area, lions and communities are living side by side, much more peacefully.

It is an iconic species; arguably the ‘King of the Beasts’. But according to the International Union for Conservation of Nature (IUCN), African lion populations have declined 43% in the 21 years up to 2014. Due to a combination of reasons, it is estimated that less than 20,000 remain. The African Lion and Environmental Research Trust (ALERT), operating with Coventry University in Zambia and Zimbabwe, is a ground-breaking project, adopting a responsible development approach that works directly with local communities, NGOs, academics, businesses, and policy makers, to generate sustained motivation to ensure the future of the species.

The idea of a pest is relative and subjective. As majestic as most will consider lions, the fact is the majority of people don’t have to share a backyard with them. Africa’s human population is skyrocketing. UN estimates suggest that the human African population, currently at 1.1 billion, will be almost 4.4 billion by 2100. In a continent where poverty and food insecurity is widespread, rural communities are heavily reliant on natural resources. As the population increases, wildlife habitat disappears, causing lions to live in close proximity to humans and their livestock.

Competing with their human neighbours for space and resources, lions find themselves in trouble. Human-lion conflict describes desperate lions using communities’ livestock kraals as easy prey. Understandably, this leads to resentment of lions as they threaten livelihoods and life itself. Consequently, lions can be killed in retaliation by those affected, or just threatened, by their presence. Despite all of the lions’ evolutionary strengths, it is a battle that they cannot win.

ALERT also works in rural schools in Zambia and Zimbabwe to assist with education in severely under-resourced regions and where living amongst dangerous predators is a daily reality.

Literacy, numeracy, science, basic life skills and vocational training are offered as part of that assistance. But, crucially for lions, children are also taught why Africa needs lions, including its symbolic status in Africa, its touristic appeal and the vital ecological role the species plays in fragile ecosystems. Local people are employed to assist in the delivery of these initiatives, meaning benefits from lion conservation are felt throughout the community.

For lion populations to succeed, local communities must have incentives to conserve them. In a place where conservation is a luxury most people cannot afford, linking benefits to the protection and restoration of lion populations is fundamental. People must want lions around for lions to stand a chance.

Combined with the environmental, community and education efforts, the local attitude-shift to want lions to exist should eventually ensure that lions remain in viable numbers on the continent of Africa.

The research team from Coventry University involved in this project were Dr. Jackie Abell, Dr. James Bennett and Donna-Lynn Shepherd.
“It’s about doing things differently,” explains Paul. “Coventry is an exciting place to be. The University is looking at the world of business and trying to find solutions to age-old problems. We’re marrying up our academics’ expertise in research and consultancy with the every-day challenges faced by businesses - small and large. We’re not trying to sell an ‘off-the-shelf’ package of support. We’re listening to businesses, getting to know them properly and finding out exactly what we can do to make them more successful and more efficient. It’s a win-win.”

All corners of the globe

During his career with the Foreign Office, Paul has lived and worked in a variety of exciting, and not-so-exciting locations. Paul’s career has taken him to Syria, Germany, New Zealand, the Congo and Australia, spending 3-4 years at a time in each location. His jobs have seen him looking after British citizens abroad in an embassy role, managing crises in war-torn regions and latterly analysing foreign policy and comparing social and economic practices to that of the UK.

Paul explained: “Lots of the policies that are introduced in the UK are a result of analysing what works overseas and testing how this would work in our economy. Tuition fees, policies on bullying and harassment and the smoking ban are all things we’ve ‘adopted’ from other successful countries.”

One of the highlights of Paul’s career was his time spent in Australia as the UK Director of Trade and Investment. “During this time the UK had a major business breakthrough. We’d worked hard over a number of years to encourage Australia to invest in the UK and allow UK exports to Australia and New Zealand and we made this happen. It was a huge move for both countries and one that brings continued benefits.”

Paul’s most recent role was as Director of Trade and Investment for the West Midlands region, that’s when he discovered the impact that Coventry University was making in the region. “I’d got to a crossroads in my career. I could either carry on working with the Foreign Office and take on an ambassadorial role somewhere in the world or I put down some roots and take on a new challenge.”

Time for a change

“I was particularly attracted to the higher education sector because of the difference UK universities can make to the world. Some of the major breakthroughs in health care, education and social policy have been as a direct result of university research and that’s really exciting.”

Paul Noon has spent 25 years working for the Foreign Office, travelling the world and solving global crises. What made him swap the Foreign Office to lead on enterprise and innovation at Coventry University?
Universities are highly innovative and have a huge impact on the UK economy. Who wouldn’t want to work in this sector?

‘Coventry University is widely known within the UK Trade and Investment (UKTI) for its work with business so I knew that’s where my skills would be best matched. Coventry is one of the most exciting universities in the sector. It’s values of innovation and creativity closely matched mine so it was a perfect fit.’

Paul has been impressed by the way Coventry University engages with business in a flexible way. The University doesn’t offer a defined set of products; it offers a capability to solve problems which adapts to the needs of individual industries. ‘Coventry’s approach is very different to other universities. When we work with businesses, we work in partnership. We share the risks, we share the benefits and we share the costs. It’s a more strategic exchange that works for both parties.’

The University operates in an agile way allowing it to respond to issues as they arise. The recent opening of CU Scarborough has opened new opportunities to work with businesses in and around Yorkshire. ‘As a relative newcomer to the area, the University hasn’t wasted any time in talking to businesses in Scarborough and finding mutual benefits.’

A joined-up approach

By pulling on individual strengths of excellent teaching, excellent research and excellent links with business the University can bring all these strands together in one place to offer a holistic solution. ‘It’s my role to get out there and talk to businesses, find out what they need and then find a way for the University to respond to that need.’

From CPD training, to research and development, the University can offer it all

One of its most recent successes is the introduction of a unique business partnership with Unipart Manufacturing. The Institute for Advanced Manufacturing and Engineering (AME) brings together the best in academia, industry and R&D in a ‘live’ manufacturing environment. The collaboration created the UK’s first ‘faculty on the factory floor’ and is attracting high-calibre students, winning major industry contracts and recently hosted Chancellor George Osborne as he announced the historic devolution deal for the West Midlands.

Paul continued: ‘Projects like AME are a great example of the University’s responsiveness. It combines rich placement opportunities, state-of-the-art teaching, industry-level live projects, world-class research and mutual success. This model is working so well that we’re in talks with another two global businesses to create a bespoke solution for them.’

‘The University’s future is very bright. It has ambitious plans for growth, but they’re achievable and exciting. I challenge any business to come to me with a problem that we can’t solve. We’ll apply our skills and creativity to anything and turn your problem into a solution.’

Want to find out more:
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@covuniresearch
E: innovate@coventry.ac.uk
What’s your research passion?

I am passionate about how we can exploit the capabilities of mobile technology to change health behaviours. For the first time ever, these technologies allow the opportunity to collect vast amounts of data on human behaviour and revolutionise existing theories of behaviour change.

What are you working on right now?

I am conducting research on how we can support public health consultants and commissioners in using academic evidence to drive their decision making in the development of public health campaigns. Additionally, I am involved with the development and evaluation of several mobile health apps for childhood obesity and childhood sickle cell anaemia within the UK and Germany.

What’s your greatest achievement?

My greatest achievement so far is winning the Innovate UK pitch for quantified nutrition for a family healthy-eating app I developed as part of my PhD (Health Heroes). It almost felt like something out of Dragon’s Den where I had to pitch to five judges and an audience! We now have the opportunity to partner with the Jamie Oliver Media Group and expand the app’s reach across the nation.

What’s on the horizon for you?

Having won a place on the Coventry Researcher Development Programme, I hope to publish in more prestigious journals; develop international collaborations on research projects; identify more sources of funding and build my research portfolio so that I can continue to expand my reputation as a specialist in public health psychology and mobile health technology.

If you weren’t doing this job, what would you be doing?

Science reporter or television presenter specialising in wellbeing and health technology!

It almost felt like something out of Dragon’s Den where I had to pitch to five judges and an audience!
Through understanding the impact of organisations' activities, behaviours and policies, the Centre for Business in Society's (CBiS) research promotes responsibility and seeks to change behaviours in order to achieve better outcomes for economies and societies.

Our traditional core interests in sustainability and economic development are now joined by teams exploring two of the biggest sources of business's impact on society in recent years: post-financialisation and the implications for economies; and, the digital economy-fuelled explosion of data with its ramifications for organisations, consumers and society.

By interrogating the impact of organisations on economies and societies our teams are focussing on:

**Examining the new circular economy, sustainability and ethical consumption.**
- Sustainable supply and ethical consumption

**Searching for durable and inclusive economic growth models with new partnerships between state, economy and society.**
- New models and policies for economic and regional development

**Exploring at the national, organisational and individual level the economic and social impacts of the financial crisis and post-financialisation.**
- Responsible finance for nations, organisations and individuals

**Addressing the implications of the digital era and big data for business, society and the economy.**
- The use, privacy and security of data in organisations and society

CBiS is home to thirty specialist researchers, a dedicated research support team, 45 PhD researchers, the Faculty of Business and Law’s professoriate and staff in the Faculty currently undertaking their sabbaticals. CBiS also looks after the Faculty's new professional doctorate programme, the DBA.

For further information visit
www.coventry.ac.uk/research
Research at Coventry University focuses on ‘Excellence with Impact’.

We achieve this through our world-leading experts taking original approaches to make a tangible difference to the way we live.

Innovate magazine is just one of the ways we share our expertise, knowledge and skills. If it’s given you a thirst for more then take a look at our website at www.coventry.ac.uk/research where you can uncover the people behind the stories and discover our cutting edge thinking.