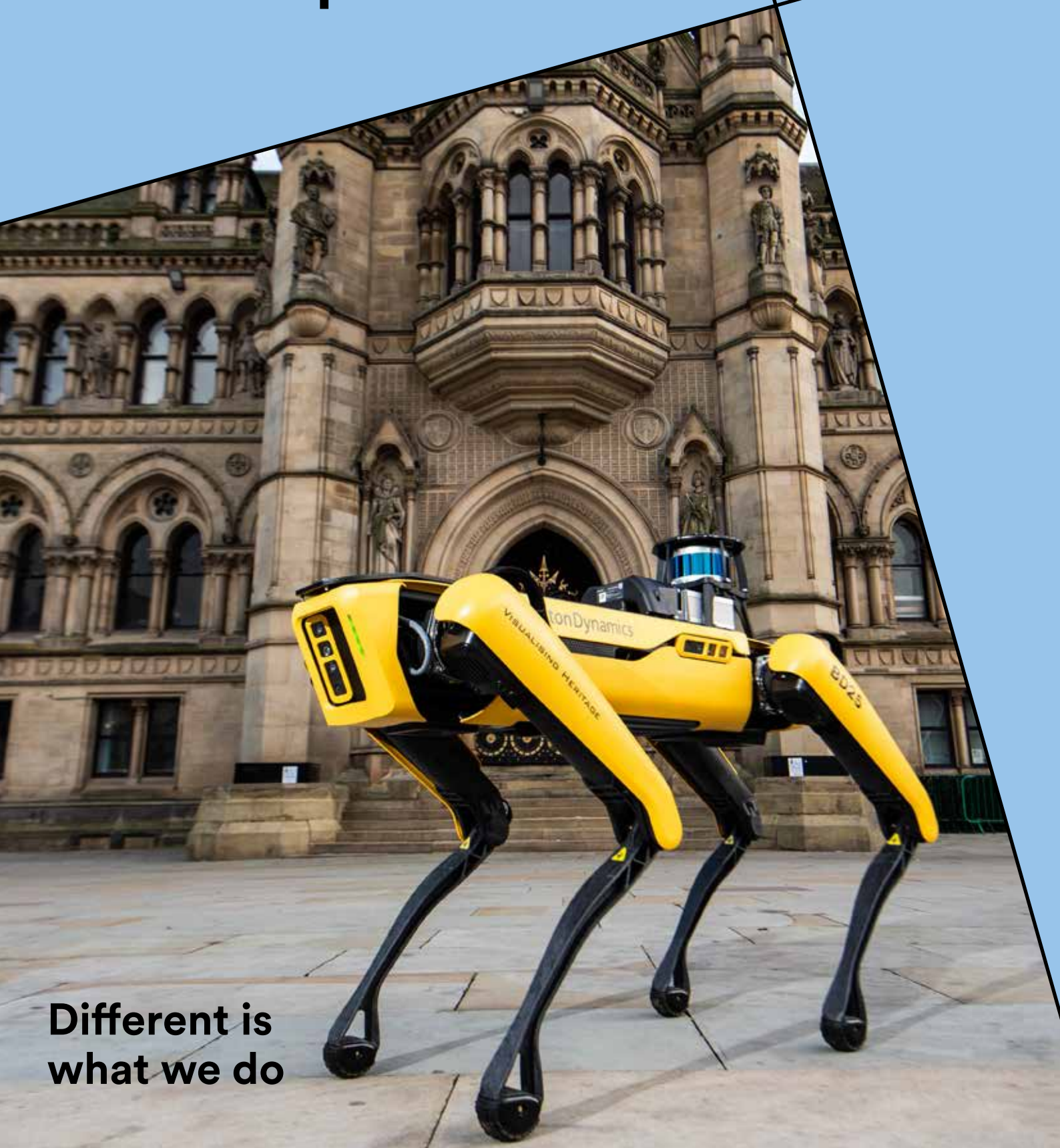
UNIVERSITY of BRADFORD

Research and Innovation Annual Report 2024/25



Different is what we do

Contents

Different is what we do

Throughout 2025 we've been sharing our research and other notable activities and achievements at the University through events, advertising, podcasts and online content to raise awareness of our University across the UK and beyond.

The theme of the campaign is '**different is what we do**', and that means how we see things differently, think differently, and how we work together to drive sustainable social, cultural and economic development.

The stories in the campaign, and in this report, showcase how we see potential, find a different approach, involve a diverse range of people, and achieve amazing things.

We're using our 'different' to make a difference.

Find out more

Professor Sherif El-Khamisy, Pro Vice-Chancellor, Research, Innovation and Engagement

Foreword

By Professor Sherif El-Khamisy, Pro Vice-Chancellor for Research and Innovation

As I step into my second year as Pro Vice-Chancellor for Research and Innovation, I want to acknowledge the dedication, resilience and hard work of our staff, which has underpinned our successes over the past 12 months. Although this year witnessed unprecedented challenges in the higher education sector, we have continued to strengthen the foundations of our research and innovation ecosystem, while delivering work that has a genuine impact on people's lives – locally, nationally, and globally.

We're excited to move into the year ahead which will see a significant change in how we organise and support our research, including the establishment of two new research institutes – the Institute of Health & Social Care and the Institute of Digital and Sustainable Futures, alongside a new Doctoral College to nurture the next generation of researchers. We have also reconfigured our research support services to sharpen our focus on research performance and culture, knowledge mobilisation, and revenue generation.

I hope when you read the stories in this report you'll find inspiration and something that resonates with your own interests and passions:

- You will discover how we are tackling global health challenges, including glaucoma, dementia, wound healing and vaccine hesitancy, and what medieval teeth can tell us about health today.
- You will learn about our work on global sustainability including refugee camps, tyre recycling and medicine supply chains.
- Meanwhile, our researchers are engaging with our communities to understand and preserve cultural heritage and exploring vital issues such as Islamophobia and the experiences of survivors of abuse.
- You'll see how we're employing AI-driven solutions to subjects as diverse as border controls, forensics and concussion in boxing; illustrating how our scientific research delivers practical solutions to complex problems.
- We are also proud of the entrepreneurial spirit that defines our community and this report showcases how we translate new knowledge into commercial and societal value.

We look to the year ahead with renewed purpose under our newly approved University Strategy, which places research and knowledge mobilisation at the very heart of our mission as one of four strategic priorities. This focus compels us to go beyond discovery, ensuring that the insights generated are translated into action – shaping policy, transforming industry, improving health, and enriching communities.

Dr Arathyram Ramachandra Kurup Sasikala in the lab

Find out more

Researcher using nanotechnology to heal bones awarded Future Leaders Fellowship

Dr Arathyram Ramachandra Kurup Sasikala, Assistant Professor in the Faculty of Life Sciences, has been awarded £2.2 million as part of a four-year UKRI Future Leaders Fellowship grant that will see the development of safe nanotechnology with healing properties, known as 'piezoelectroceutics'.

The project led by Dr Sasikala will focus on bone healing, identified as a major health challenge, especially in older people who are more likely to develop fragility issues and conditions such as osteoporosis later in life, which costs the NHS billions of pounds per year to treat.

Dr Sasikala, whose previous research has included using nanoparticles for cancer treatment and smart biomedical devices, describes the unique technology at the heart of the project:

"It will be an injectable gel-based implant which can generate electrical signals without any batteries or power supply, getting the energy it needs to function from the normal movement of the body. The main advantage of this technology is that it works like the body's own healing processes that use electricity and augments them to accelerate bone healing. While electrotherapy treatment has been used before, it uses heavy equipment with wires and electrodes that can be very uncomfortable for the patient. This new technology has the potential to transform the way bone healing is treated, with no need for surgery or additional equipment."

The UKRI Future Leaders Fellowship is designed to provide the tools to develop researchers into world-class research and innovation leaders in academia and business, and provides funding for four years initially, with the potential to extend the project for a further three years. The grant will fund two PhD studentships and a research fellow for four years, another research fellow for two years and a lab manager to help execute the project.

The project team will include collaborations with Leeds Teaching Hospitals NHS Trust, the Universities of Cambridge, Leeds, and San Diego California and industry partners such as Summit Medical, a manufacturer of healthcare products. Dr Sasikala will spend time with the partners to learn from their specific areas of expertise in the early stages of the project. She will also be organising workshops and meetings in the UK and internationally, sharing the ideas behind piezoelectroceutics with the goal of inspiring others to get involved with this new field of research.

New technique to improve the accuracy of glaucoma diagnosis

"We can take a raw image from imaging devices that are already in widespread use and process that in a new way. We use front on scans to construct a 3D image to see below the surface and through the retina at the defects that are caused by glaucoma. High Street optometrists currently detect more than 90% of cases, so our analysis system could be put into the equipment they use as a software update and used as an additional tool in the very early stages of detecting the disease."

Work is underway on a £1.18m project funded by a Medical Research Council grant which could help improve diagnosis of glaucoma, the leading cause of irreversible blindness, and reduce misdiagnosis rates.

The project, led by Dr Jonathan Denniss, Associate Professor in the School of Optometry and Vision Science, is targeting two major issues of glaucoma treatment:

- **It is difficult to diagnose - current techniques miss 20-30% of cases**
- **misidentification is common, which costs the NHS over £36 million per year**

This new technique has the potential to reduce false positives, with a 5% reduction equating to a saving of around £1 million a year for the NHS, releasing people from the burden of regular hospital visits and freeing up appointments for genuine glaucoma patients.

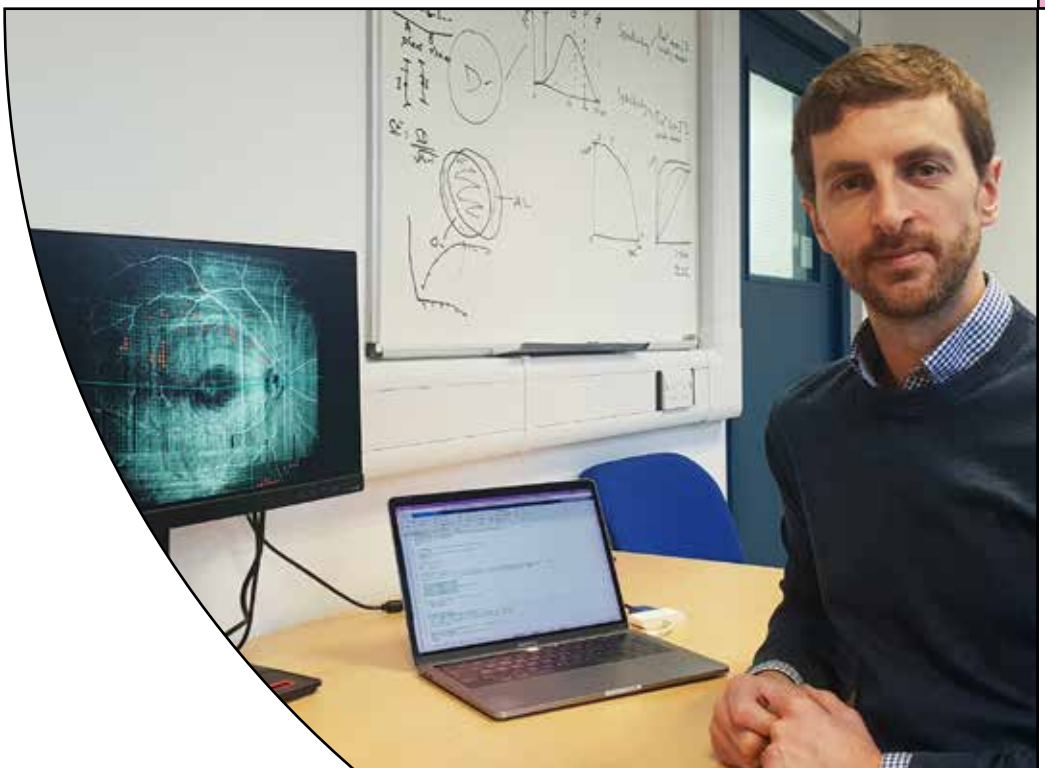
It works by exploiting the capabilities of equipment available in most high street optometrists and hospitals, as Dr Denniss explains:

The technology could also be used to monitor patients with glaucoma who require regular hospital checkups, giving a clearer picture of any changes in the eye.

The four-year project will be supported by researcher Dr Riccardo Cheloni who conducted the initial work on the new technique during his PhD studies at the University of Bradford. Initial data gathering will involve performing a variety of eye tests on volunteer participants at the University's Eye Clinic. The team will then use the imaging equipment to collect multiple scans of the eyes that will be processed and analysed to help refine the technique.

It is hoped the project will lead on to clinical trials and a collaboration with an instrument manufacturer to help implement the technology, which could have an impact on glaucoma treatment across the world.

Find out more



Dr Jonathan Denniss showing the eye scanning technology

New technology unlocking prehistoric secrets buried under the sea

Our ancient ancestors often thrived in coastal areas but these locations have posed problems for archaeologists as rising sea levels mean that artefacts from prehistoric life are now under water in some areas. However, advances in technology and the pioneering work of our Submerged Landscapes Research Centre have allowed us to explore these formerly inhabited areas now under the sea in unprecedented detail, and discover new insights into life around 12000 years ago.

The Life on the Edge project, led by Dr Simon Fitch, UKRI Future Leaders Fellow at the Submerged Landscape Research Centre, is exploring sites around the world which have hidden histories just off their coastlines, including Japan, the Gulf of Mexico, Belgium, Wales and Croatia.

The latest explorations in Croatia took place in July 2025 in collaboration with The University of Split, and utilised equipment recently acquired by the University of Bradford using an £800,000 UKRI RICHeS (Research Infrastructure for Conservation and Heritage Science) grant, which has made the expeditions both more mobile and more precise, as Dr Fitch explains:

> "Our global navigation system is capable of centimetre-level precision, which means we can drop the divers to exactly the right place straight away, saving us hours. The new Innomar Sub-Bottom Profiler (SBP), used to investigate the sediment structure buried beneath the seafloor, also has been a huge step change in how we work. The previous version weighed a tonne – literally – and was extremely expensive and complicated to transport, but this portable version weighs less than 32 kg and can come on the plane with us. We've also got an underwater Remote Operated Vehicle to allow us to view the site and take some great video footage."

During a week of exploration, the team gained new insights about the ancient site through digital scans, sediment core samples, and uncovered artefacts, but the team have also engaged with local communities and organisations to bring benefits to the region. Artefacts found will be displayed at the nearby Kaštela museum, and they have welcomed local school children to visit and see the excavation in action. They are also collaborating with the Croatian Heritage Ministry, and a company who are planning the construction of a bridge across the bay to Split, who are sharing their data to get the benefit of Dr Fitch and the team's expertise of the structure of the seabed.

Project partners from the University of Split excavating the sea floor in Croatia (courtesy Jerko Macura).

Find out more

Dr. Cotella with young refugees in Al Baqa' camp during fieldwork.

Find out more

Empowering residents of refugee camps to map their home and effect change

The Al Baqa'a refugee camp in Jordan has seen massive growth since it was established in the 1970s to house Palestinian refugees, but decades of unregulated building and overcrowding have led to water supply and other environmental issues that affect its residents' quality of life. Our researchers, alongside Jordan's Royal Scientific Society and Applied Science Private University, have been working with young people in the camp to map out their neighbourhoods using mobile phones to provide the evidence needed to address the issues.

The Community Mapping (CoMAP) project, funded by the Royal Academy of Engineering, focused on the resources at the camp, known as the Water-Energy-Food-Environment (WEFE) nexus, with the intention of sharing ideas, information and personal stories to create a flexible database that can be used to influence policymakers. The young people led the mapping efforts, collecting points of interest based on their own priorities, and also provided an essential connection to older generations in the camp less familiar with technology.

The University of Bradford team, which included Visiting Researcher Dr Victoria Cotella, Professor Iqbal Mujtaba and Professor Ciprian Daniel Neagu, coordinated the project and were responsible for data management, which included the use of AI to improve data analysis.

The culmination of the project was the Digital Technologies for Refugee Resilience conference in Amman, Jordan in April 2025 where the young participants presented their work to stakeholders including the Palestinian Affairs Department, the United Nations Relief and Works Agency for Palestine Refugees (UNRWA), local universities, and government officials.

The Bradford team also presented a complementary project at the conference: Sustainable, Innovative, Affordable, and Net-Positive (SIAH-NP) Housing Solutions. The project is a collaboration with Yarmouk University and Applied Sciences Private University in Jordan, and the University of the West of England, which focused on designing housing for communities vulnerable to climate change and displacement in Jordan and South Africa.

Both projects have opened the door to wider collaborations. The CoMAP team is now working with international partners, including Ankara University and University of Westminster, to expand the mapping approach to other refugee camps and further develop sustainable housing solutions.

"As these projects grow, so do the opportunities to connect with new partners and communities," said Dr. Cotella. "We're excited to take the next steps together, building on what has been achieved to shape sustainable solutions for the future."

Dr Kamran Mahroof (third from left) hosts the Fight or Byte event on the boxing-themed stage

Find out more

Applying AI technology to help prevent concussion in boxing

A new app created at the University of Bradford can be used by boxers to help diagnose concussion and prevent more significant injuries occurring.

The technology is designed to be used as a quick way of checking for concussion during training and at other times outside official matches where a medical professional wouldn't generally be present.

Dr Kamran Mahroof, Associate Professor in Supply Chain Analytics, worked with Dr Irfan Mehmood, Associate Professor in Business Analytics (UoB lead) Medical Clinician Akeel Hussain (Clinical lead) and data scientist Mark Barrett to develop the technology. Dr Mahroof describes the background to the project:

"A theme of my research is 'technology for good', where I look for interesting uses of AI beyond more traditional business cases, and this led to a discussion with Dr Mehmood, who was working on concussion management. Coincidentally around the same time, I was at a boxing match where a fighter looked a bit dazed before the fight; there was a doctor present in this case, but it struck me that a simple tool for boxers to self-diagnose concussion would be an interesting idea to pursue."

The app features a series of tests to assess how accurately the eye tracks a moving point, as slow and unsteady eye movement is an effective indicator of concussion. It shows the results in a simple red, amber or green rating to suggest if any further action or treatment might be needed.

Creating the app involved input from clinicians and sportspeople to help refine the algorithm, and the team will continue to test as they move towards making the app a commercial product, which has the potential to be used across a range of sports. The innovative technology was featured on BBC's flagship technology programme, TechNow and Boxing News Online.

Dr Mahroof's interests in boxing and AI also led to a successful public event as part of City of Culture 2025 activities called 'Fight or Byte: Can AI transform the boxing world?' in April 2025. The panel for the event included former world champions Jawaid Khaliq MBE and Tasif Khan on stage in a boxing ring in our campus sports centre, Unique Fitness. Panellists discussed the role of AI in boxing for judging fights, improving training techniques and preventing injuries, and the audience gave their opinions on the questions raised by voting with boxing-themed cards.

Exploring the psychology of football, from refereeing to the dangers of headers

Dr Daniel Walker, Assistant Professor in Psychology, has translated his interest in football into a series of studies looking at different behaviours relating to how we approach sport, from managing injuries and potential harm to how the game is officiated at the highest level.

Dr Walker's study into the use of the Video Assistant Referee (VAR) has involved examining the last four seasons of English Premier League matches, specifically the moments when a referee has been advised to review their decision at the pitch-side monitor. Around 95% of the time, the referee will overturn their decision. As a psychologist, he was interested in the factors that were part of this decision-making process, such as home advantage, the scoreline, and attendance in the stadium.

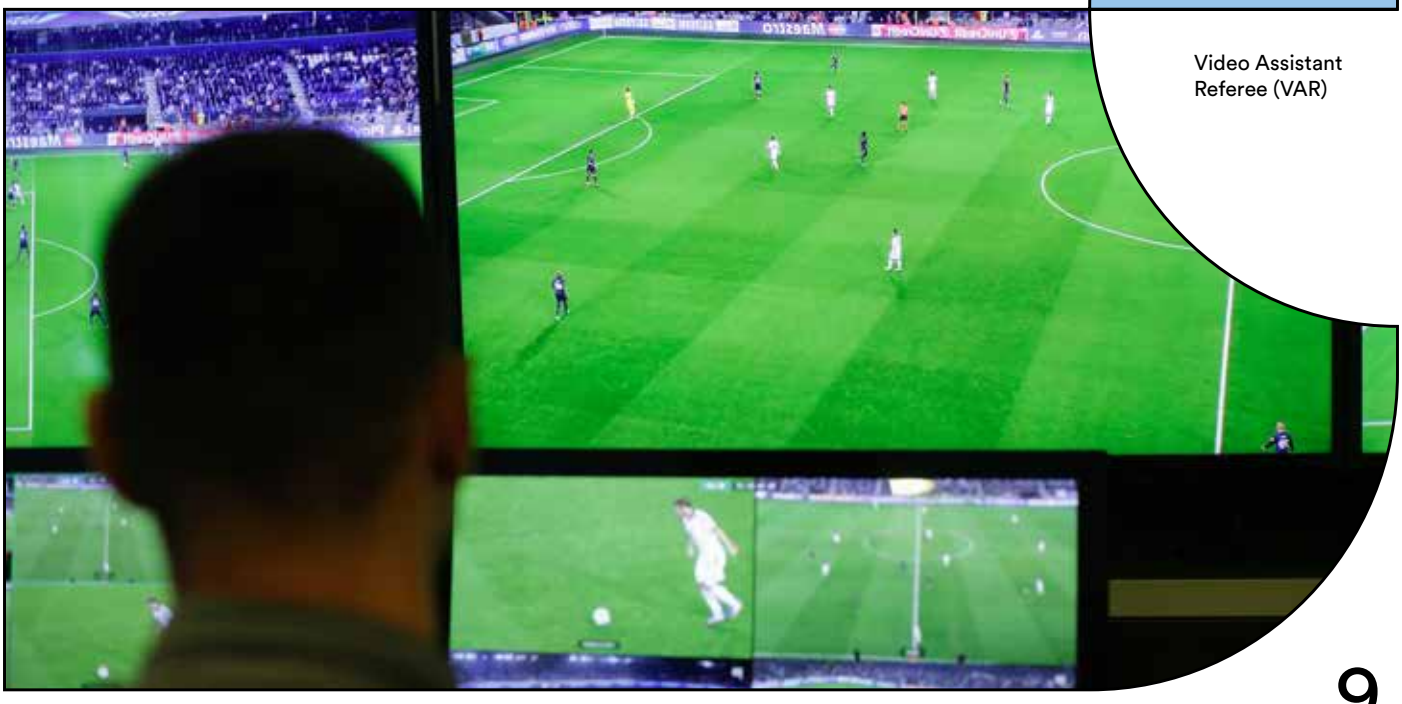
When presenting his research to Ben Campbell, Head of Communications at PGMOL (the referees association), it helped contextualise the findings and focus his research on the psychology of the occasions where the referee maintained their decision opposing the input of the VAR:

"We agreed that the few maintained decisions - where the referee thinks that the VAR is wrong - is a more interesting psychological issue to explore. The next step would be to interview some of the officials and understand their thoughts and feelings around the current protocol and what their motivations are on the rare occasions they would decide to stick with their original decision. I'm hoping we can arrange this and continue to develop the relationship with PGMOL to enable more studies that can translate to improved VAR policy in the Premier League."

Dr Walker's other work examines concussion in football and other sports, and why players choose to ignore injuries that can lead to poor mental health, impaired cognition, reduced quality of life and neurodegenerative diseases like Chronic Traumatic Encephalopathy (CTE).

He is also interested in the protocols around children heading the ball in football and is exploring the ways that policies are being implemented and whether they are stringent enough considering the evidence of potential harm. He has been in discussions with Robbie Moore, local MP and Shadow Minister for Environment, Food and Rural Affairs, about current government legislation and further work that could be done to protect children in sports. Together, they have written to the Department for Culture, Media and Sport and are currently awaiting a response.

Find out more



Video Assistant Referee (VAR)

Understanding and addressing the vaccine concerns of young mums

Our researchers are working on a project to understand the reasons behind vaccine hesitancy among young mothers in our region which means that vaccine uptake is significantly lower in West Yorkshire than other parts of the UK for women and their children.

This work is particularly timely as the UK has recently seen multiple outbreaks of measles and whooping cough among children, including some reported fatalities.

The project was enabled by a £150,000 grant from the Medical Research Council to establish the barriers to vaccinations among primarily ethnic minority women, and to work with these communities to produce communications tailored to them. The team, led by Dr Elizabeth Kiilu, Assistant Professor of Public Health, was supported by colleagues Dr Syka Iqbal and Dr Melanie Cooper and collaborators at the Bradford Institute for Health Research, Bradford Council and the University of Leeds.

Dr Kiilu explains the process:

"Our preliminary research showed the key barriers to accessing vaccinations were the misconceptions around vaccines, the language barrier and issues with accessing the healthcare system. Using this information, we held focus group discussions with 30 women from 15 different communities within West Yorkshire, and we integrated their ideas to co-develop a digital tool that will help clarify the benefits and demystify some of the misunderstanding around vaccinations for women and their children. For example, lots of people aren't aware that there are Halal and vegan vaccine options available."

The DAISI (Digital Animation In Service Improvement) model was chosen as it had been successful in communicating other healthcare issues through short, animated films that convey messages through simple imagery. One of their benefits is that the video can be produced in several different languages, in this case Urdu, Swahili, Arabic, Farsi and French will be used to help target the communities who have expressed that the language barrier is an issue for them.

The video created was tested by a group of women who represent the target audiences, and their feedback was considered in the production of the final version. The next steps will be to disseminate the video through partners in the NHS and community organisations using social media, printed materials and other channels. Proposed additional funding will make it possible to include more regions of the UK and translate the video into other languages.

Find out more

Dr Kiilu presenting the project at a conference.

Dr Julia Beaumont with dentine samples

Find out more

Medieval teeth give insights into life during the plague

Our School of Archaeological and Forensic Sciences played a key role in a major study into medieval lives and the changing conditions Britons faced around the time of the bubonic plague. Researchers analysed the teeth of 275 individuals buried in London and Lincolnshire between 1000 and 1540 CE, uncovering a direct link between early-life malnutrition and later-life mortality.

Bradford's Stable Isotope Laboratory was used to process samples of dentine (the hard tissue of the tooth underneath the enamel), led by Dr Julia Beaumont. She describes the process:

"Dentine is very useful as a record of time and has an advantage over bone, which only gives an average of around ten years or more, in that we can see approximately annual changes in the teeth that give us an insight into what actually happened during childhood for these individuals. Using a technique refined at Bradford, we cut the teeth up into small sections, then take the collagen from that dentine and measure the carbon and nitrogen isotope ratios. This relates to the protein being consumed at a given point to give us an idea of the person's diet through childhood and adolescence."

The turbulent time covered by the researchers includes the Little Ice Age, which led to crops failing and severe famine across Europe; the Great Bovine Pestilence from 1318, where around two thirds of the cattle in England and Wales died; the Black Death from 1348 and the pestis secunda, a second wave of plague from 1361-62. The team were able to map the samples based on their approximate date of death against these events to see how they affected nutrition levels in childhood.

Using additional data about the skeletons from the Museum of London and the University of Sheffield, researchers found that when compared against those who did not suffer malnutrition, adults over 30 who had suffered early-life nutritional stress were significantly more likely to show skeletal signs of chronic inflammation and had lower survival rates than their peers.

The findings support modern theories about the developmental origins of health and disease, which link early environmental stress to chronic conditions in adulthood. Further research is taking place in a PhD project using the same techniques to explore the diet and health of mothers and children, looking at the importance of nutrition in the first 1,000 days of life.

Prof Ajay Mahajan (left) and Dr Kirsten Riches-Suman (right) with local firefighters who have raised money for the Burns Unit in 2025.

40th anniversary of tragedy highlights importance of Burns Unit to Bradford community

Find out more

2025 has seen many commemorative events for the 56 people who died and 258 injured at Bradford City football club on 11th May 1985, as the community still feels its effects 40 years on. The Plastic Surgery and Burns Research Unit (PSBRU) was founded by the late University of Bradford Professor David Sharpe in response to the hundreds in the stadium that day who suffered burns and related injuries.

This powerful connection between the PSBRU and Bradford City FC and their supporters has endured, and the work of the unit is supported by the generous donations of the community, who have raised funds through a range of activities since its inception that contribute directly to the resources of the unit.

Director of the PSBRU Professor Ajay Mahajan brings his experience as Consultant Plastic Surgeon at Bradford Teaching Hospitals to the unit; he has featured in many of the recent commemorations, including documentaries about the disaster on ITV and BBC.

Associate Professor Dr Kirsten Riches-Suman is academic lead for the PSBRU. She oversees the laboratory space, academic supervision, administration and professional support:

> "I bring my expertise in cell biology and wound healing to the unit - I am a supervisor for the Burns Unit fellows, and work hard to get our substantial body of research published. I'm also a contact for anyone who wants to get in touch about fundraising and promotional activities including social media and arranging tours. I'm from Bradford, so as well as my academic interest I've got a very good understanding of what it means to our community."

The current PSBRU David Sharpe fellow, Dr Mohamed El-Nemr has recently begun research using AI algorithms to help clinical decision making, supported by Krzysztof Poterlowicz, Professor of Bioinformatics and Biomedical Data Science. This project is the latest in the unit's history of ground-breaking research, and the first came from treating victims of the fire in 1985 - Prof Sharpe invented the Bradford Sling®, designed to immobilise the arm to prevent damage to injured areas, a device now used worldwide for treating hand injuries. The unit also introduced the medical use of superglue for skin grafts, have explored the use of stem cells to reduce scarring of breast tissue following radiotherapy, and studied the benefits of vitamin D in treatment for burn healing.

Immersive technology brings Bradford football fans' history to life

'Stories from Valley Parade', created by our researchers, is an immersive digital social history of Bradford City FC featuring a huge collection of experiences from supporters, mapped to a 3D digital model of the stadium.

The project was officially launched at the University of Bradford Stadium, traditionally known as Valley Parade, with a family-focused event in June 2025. The event also commemorated the 40th anniversary of the tragic fire at the stadium (see page 12) and was part of the University's City of Culture 2025 activities.

Chris Gaffney, Professor of Archaeological Science led the project, which built on his previous work with the Visualising Heritage team:

> "My research is about creating context for archaeology by combining the things we find beneath the ground with the heritage built above ground. By blending these elements, we can really add value to the stories of the places we investigate.
>
> It's the same concept here because we've used drones and ground-based laser scanning to recreate the exact framework and overlaid it with high-quality photography to create this great model of the football ground and the surrounding streets. It's imbued with greater significance however by having the stories inserted into the model to show the importance of the stadium to the community it serves."

The innovative equipment used in the project was purchased with funding from the Arts & Humanities Research Council's (AHRC) Capability for Collections (CapCo) fund, and follows projects to digitally map Bradford city centre, Saltaire and more. The event also utilised the University's 'igloo' - a domed structure that allows people to step into the 3D environment through 360-degree projections and enjoy a shared experience with others; the model was also demonstrated through VR headsets.

The collection of poignant, funny, heartwarming and hopeful stories reflect the Bradford community but also the nature of football support. It is hoped that this can be exhibited more widely, and can also become a model which can be applied to capture the heritage of other football clubs across the country.

In a related project, PhD student Mia Coe will be researching the role of heritage and archaeology as therapy, looking at how stories and items from Bradford City Football Club may be useful for those who had experience of the fire and, 40 years on, face living with dementia and historical trauma.

Find out more

A young Bradford City fan at the event exploring Stories from Valley Parade with a VR Headset.

Enterprise fellowship helps polymer researchers to launch new company

Professor Stephen Rimmer and Dr Thomas Swift from the Faculty of Life Sciences have used their research into polymer nanotechnology as the basis for a new spin out company, Molecular Titans.

The innovative diagnostic method patented by Prof Rimmer and Dr Swift can rapidly and accurately identify bacterial or fungal infections such as UTIs and eye conditions, sometimes even before symptoms worsen. This means the potential to reduce diagnosis times from as much as 48 hours down to 30 minutes, ensuring quick treatment and avoiding the unnecessary prescription of antibiotics while awaiting results.

The new business aims to identify partners who can help create products using the versatile technology, which has applications in healthcare and could also be used in veterinary care, food production and more.

Dr Swift identified the Bradford Renduchintala Enterprise Ecosystem (BREE) Staff Fellowship - set up to work with our academics to develop research with commercial potential into fledgeling businesses - as a good starting point, and was accepted on the first cohort of the initiative.

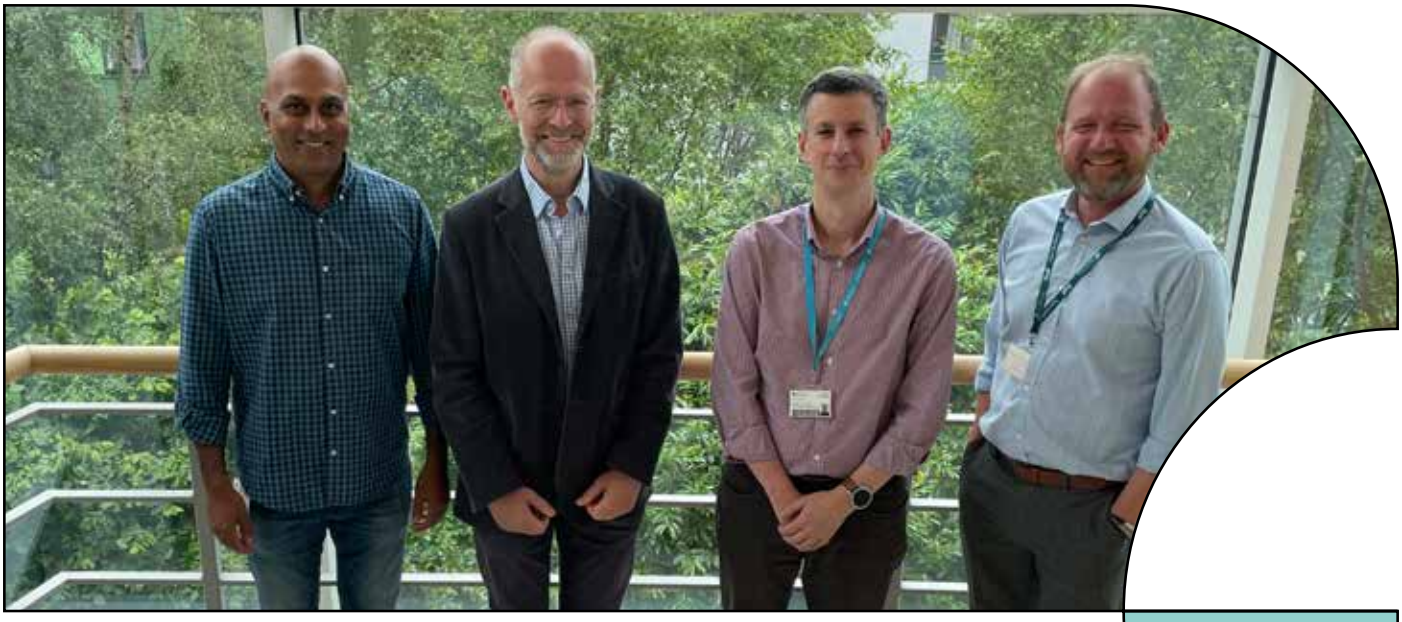
"The BREE fellowship was really useful; the first few sessions helped me think about commercial models and understanding how you plan the structure and organisation of a business – the technical things I would never have envisioned. But what really worked was two months into the fellowship, it was suggested that we apply to Innovate UK for their ICURe (Innovation-to-Commercialisation of University Research) funding to help us with the market discovery side of things. We were awarded £35,000 funding to pay for my time and travel overheads, plus a website, a 90-second animated video explaining how the technology works, digital marketing and a survey."

Thanks to the funding, Dr Swift has promoted the business opportunity at conferences in Germany, Italy and India, making connections and having conversations about potential applications for the technology, and learning more about the regulations around healthcare products. Molecular Titans was recently featured by BioNow, a non-profit organisation promoting life sciences, and was part of their BioCap conference to highlight opportunities for investors. Professor Rimmer has been enrolled on the Royal Society of Chemistry 'Change Makers' programme, giving further opportunities to promote the innovative technology.

The next phase for the company is to create sample materials that can be given to partner organisations to test the technology's effectiveness in their own applications, and they plan to employ a Commercialisation Officer to progress their business partnerships.

Find out more

Dr Tom Swift (left) and Professor Stephen Rimmer in the lab.



Dr Harsha Kantamneni, BREE Business Mentor Richard Boyd, Prof Robert Falconer and Prof Klaus Pors.

Find out more

Cancer innovations underpinning the creation of new companies

Our commitment to creating enterprise opportunities for staff has led to more University-backed companies, including two that draw upon our expertise in cancer therapeutics and aim to bring new medical technologies to market.

Dr Harsha Kantamneni and Professor Klaus Pors from the Institute of Cancer Therapeutics (ICT) have enrolled on the BREE Fellowship Scheme (see more on page 14) to help develop their ideas into commercial enterprises.

Dr Kantamneni joined the programme through a spin-in model (bringing an existing venture into the University) rather than the more traditional spin-out pathway (a way of commercialising ideas produced within the University), as he explains:

"I co-founded Hado Therapeutics five years ago with a colleague from Bristol University and secured early investment, but progress was delayed during COVID before we identified a set of promising molecules. Drug development is a long journey - typically between five and ten years to achieve full validation. The BREE Fellowship enabled the company to embed within the University and the ICT, providing both scientific collaboration and enterprise support. That combination strengthens our credibility and positions us for sustainable growth."

Hado Therapeutics now builds on Dr Kantamneni's expertise and the ICT's research strengths to advance precision medicines for areas of high unmet need. Its dual-targeting approach - designing molecules that act across more than one disease pathway - offers greater potential for clinical success. Current programmes include therapies for Parkinson's disease and glioblastoma, an aggressive form of brain cancer.

Klaus Pors, Professor of Chemical Biology, is collaborating on Hado Therapeutics and has created another company, UNIK Biotherapeutics, which is also receiving support from the BREE Fellowship Scheme. UNIK Biotherapeutics, co-founded with ICT Director Robert Falconer, also benefits from the work of ICT colleagues and students and is focused on the discovery of new medicines created from biological sources such as proteins and antibodies. This includes antibody-drug conjugates (ADCs), which combine potent cancer cell-killing drugs with antibodies to specifically target aggressive cancer cells, minimising harmful side effects that are associated with chemotherapy. Prof Pors said:

"ADCs are rooted in a platform technology that allows us to develop smarter and safer drugs for several cancer diseases including bladder, breast, colorectal, prostate and rarer childhood cancer diseases. We are very excited about UNIK's research & development programme, and thank the University of Bradford's leadership, the commercial innovation, and the BREE teams for supporting the first steps of what will hopefully be a long and successful journey."

AI-assisted molecular fingermark analysis helping to identify criminals

Our expertise in visual computing is being employed to improve an emerging technique used by police to identify criminals and solve crimes.

Hassan Ugail, Professor of Visual Computing, is part of a team that includes researchers from Sheffield Hallam University, West Yorkshire Police, Molecular Horizon and Waters Corporation working on a new AI system to assess the traces of chemicals left behind after touching a surface at a crime scene, known as molecular fingermarks, and ensure they are of sufficient quality to be used in an investigation.

The technology uses the same type of AI-based algorithm that Prof Ugail used effectively in creating facial recognition software; he describes the new application:

"Using mass spectrometry imaging, we map the tiny chemical traces in latent fingermarks (such as sweat and natural skin oils) to create images that feed our machine learning model. Working with West Yorkshire Police and Sheffield Hallam University, we built a large reference dataset that West Yorkshire Police examiners graded for their suitability as evidence which is then used as an automated triage system for usable prints. This replaces a previous manual workflow and can cut processing time from hours or days to just seconds."

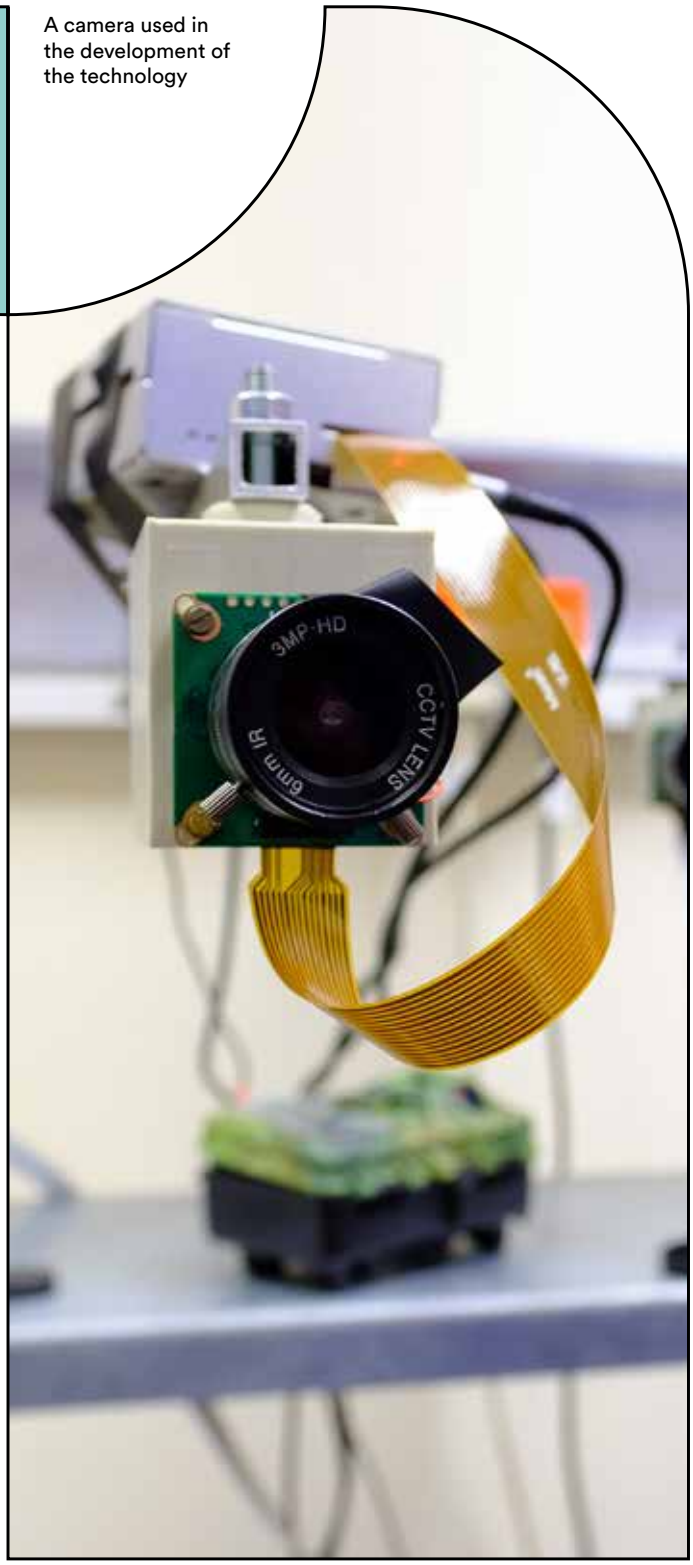
Analysis of this type gives police an extra tool in the forensic examination of crime scenes, as it has the potential to indicate who touched an object and what they may have handled. This is particularly useful where visible fingerprints are incomplete or unusable. It also makes the process more efficient by reducing the possibility of human error when assessing the fingermarks' value as evidence.

Funding for the work came from a DASA (Defence and Security Accelerator) grant, awarded by the UK Ministry of Defence who support projects that provide innovations to improve UK security and prosperity. Working closely with West Yorkshire Police, the project team were able to show the effectiveness of their existing technology which can then be applied across the country and worldwide.

The technology partner Molecular Horizon, a company based in Italy, were able to offer advice on the implementation of this technology as they already provide software to police services in the UK and globally. Following final testing, it's anticipated that this new software will be commercially available through Molecular Horizon as project partner and provide an income stream for the University.

Find out more

Find out more



A camera used in the development of the technology

New scanning technology to enhance border security

Our expertise in engineering and machine learning has led to new technology that will improve security at land and sea borders by offering additional levels of identification that can be accessed with a portable device.

Raed Abd Alhameed, Professor of Electrical and Electronic Engineering, and Rami Qahwaji, Professor of Visual Computing, supported by research assistants Dr Mohamed Abdul-Al and Dr George Kumi Kyeremeh, have produced a scanner that can analyse a face in three dimensions combined with a sophisticated fingerprint reader which is much less susceptible to fraud.

For the face recognition, the team used infra-red image capture in addition to conventional photography which produces additional markers that increase the accuracy of the system, powered by an algorithm that was developed in tandem with the hardware.

The sophisticated fingerprint scanner analyses sweat pore patterns and skin conductivity as well as images of the veins in a finger to greatly reduce potential fraud, for example with a prosthetic finger or a copied fingerprint.

The portable prototype of the scanning equipment, created in collaboration with the Instituto de Telecomunicações, Portugal, features a built-in touchscreen, a high-resolution fingerprint scanner and a 3D camera which enabled the technology to be tested at border control trials. In successful tests co-designed with border authorities, border officers themselves were authenticated via fingerprint before accessing the device (an important security step to prevent misuse of the system), and the device was used to verify the identities of the people travelling through the border by scanning both a fingerprint and a 3D facial image (known as biometrics) on the spot.

The system includes an integrated electronic passport reader attached via USB, allowing officials to scan passports or other identification alongside biometrics. This all-in-one solution means that a person's identity document and live biometric traits are cross-checked in one go, a process that was not possible in the field before and which greatly increases confidence of a genuine ID confirmation.

The project ran from 2020 until the end of 2024 and was funded by an initial EU Horizon 2020 grant of just over €1m and included collaborators from Spanish IT company Iquadrat, the University of Patras, Greece, and German Communications company Acticom.

Prof Abd Alhameed's related current projects include investigating the use of radio frequencies in bone healing and work to enhance the 6G data signal.

Rubber being recycled in the solid-state shear milling machine

Find out more

Innovative recycling techniques to combat global waste tyre problem

An estimated 1.5 billion tyres are disposed of every year which has a huge environmental impact, and the global market for new tyres also means that demand for rubber is high, leading to the destruction of large areas of tropical forest in Southeast Asia to be replaced by rubber plantations.

These factors combined point to a growing need for a sustainable way to transform tyre waste into new tyres and other high-value products, something Dr Rob Innes, Post-Doctoral Research Associate within our Polymer IRC and Innovative Engineering Research Centre has made the focus of his research.

The big challenge with recycling tyres is that they are designed to have different properties for each part of the tyre (the tread and sidewall for example) and are made of a combination of different materials, which means sophisticated methods need to be used to extract material for recycling.

Dr Innes has produced a proof-of-concept material that contains 23% recycled rubber with the same characteristics as a standard tyre – there aren't any tyres currently available with more than 10% recycled materials.

Recently a collaboration with Queen Mary University of London (QMUL) has led to even more impressive results, as Dr Innes explains:

"QMUL published a paper earlier this year on using a metal catalyst to recycle rubber which works as an active ingredient to improve the properties of the rubber after the recycling process, using basic rubber and adding the catalyst at the beginning. During the International Rubber Conference, we discussed how our techniques and equipment could potentially help to apply this idea to end-of-use materials.

The difference we made was to add the catalyst as a powder during the recycling process (rather than at the start), and this combined with the use of our solid-state shear milling machine, the only one in academia in Europe, produced outstanding results."

They found that combining the catalyst using this method can create a product with 50% recycled material that has the same properties as virgin rubber, and tests are underway on formulations with as much as 75% recycled material.

Going forward, Dr Innes is keen to work with partners in industry to further understand the formulations of commercial tyres and develop recycling solutions that can be applied at scale to make recycled tyres a commonly available product.

Tanzania's pharmaceutical supply chain provides insights for rest of world

Pharmaceutical waste has both economic and environmental implications for every country, and researchers including Liz Breen, Professor of Health Service Operations in the School of Pharmacy and Medical Sciences, were given a unique opportunity to examine the pharmaceutical supply chain in Tanzania to assess the sustainability of medicines in a developing country.

Prof Breen, whose research expertise includes medicines logistics and distribution, was invited to contribute to the project by a previous student of hers. Goodluck Nyondo, a graduate of the Master of Pharmacy Technology and Medicines Control programme at Bradford, now based in Tanzania led the team, which also included other researchers at the Muhimbili University of Health and Allied Sciences, David Myemba, Amani Anaeli and Suzana Majule from the Medical Stores Department in Tanzania. Funding for this study was competitive and supported by The Global Health Supply Chain Summit (GHSCS) Group, and Chemonics International.

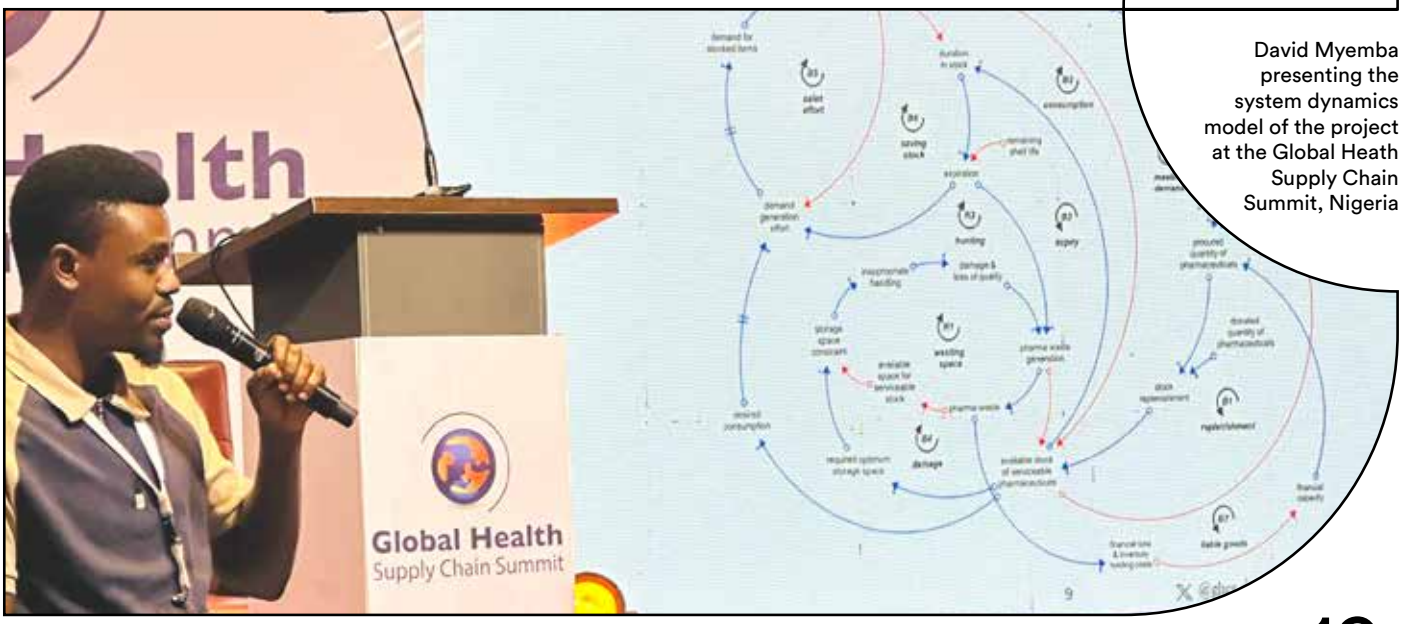
Prof Breen describes the scope of the research:

> "To date, nobody has really examined the financial, economic and environmental impact of pharmaceutical waste in any country, never mind developing economies, so our aim was to try and address this with a small-scale study. We wanted to examine the causes and scale of pharmaceutical waste in Tanzania and identify points of waste creation. Our findings showed that waste disposal policies were being introduced with good intent, but their implementation was too labour intensive and costly, so people were circumnavigating them with dangerous and possibly illegal practices, leading to increased environmental hazards."

The researchers conducted interviews, focus groups and group model building workshops with people across the sector, including the supply chain, clinics and hospitals, government officials and patients. From this information, they identified examples of good and bad practice and created a clear picture of the waste ecosystem in terms of what is being generated, what's being disposed of safely, and what can potentially be recycled or repurposed in some way.

The researchers used system dynamics modelling, a method of demonstrating complex relationships in a structure, to present the findings in the report. The team have presented at two conferences and will be looking at opportunities to develop funding for further projects exploring other countries with a similar social economic position.

Find out more



David Myemba presenting the system dynamics model of the project at the Global Heath Supply Chain Summit, Nigeria

Study into Muslim experiences of higher education shows more work to be done across academia

Researchers exploring the perceptions and experiences of Muslim students and staff at the University of Bradford have produced a report which draws attention to the inequalities still present in academia, and the work that still needs to be done to make universities, including ours, more inclusive.

The report, funded by the Aziz Foundation as part of its Muslim Friendly Universities Programme, highlighted that despite a large Muslim student demographic among a diverse campus community, staff and student respondents reported that they have experienced Islamophobia and felt discomfort on campus.

Dr Yunis Alam, Head of Department of Sociology and Criminology, worked alongside Dr Izram Chaudry, Lecturer in Criminology and Sociology on the study. Dr Chaudry explains the background:

“Yunis and I have been working in the subject of racism and ethnicity studies for some time, and we’ve covered Islamophobia in the context of higher education, but this opportunity allowed us to do an internal audit of our own institution, as one of three UK universities selected for the grant.”

The project involved six months of qualitative research, exploring the lived experiences of Muslim staff and students and it was essential that the researchers strived to avoid bias, as Dr Alam explains:

> “Our method was very open, and we cast a wide net for people to come forward to constitute the sample; we avoided leading questions, or questions that would kettle people in a particular direction, and without any prompting or solicitation, people talked about their good and bad experiences. It turned out to be quite cathartic for the respondents, and points to the fact that there aren't dedicated places where people can open up about their experiences.”

This research adds to growing evidence that acknowledges Islamophobia as a reality for many students and employees within higher education (HE), but when the study was presented at a conference, the finding that even ethnically diverse campuses like Bradford are not automatically immune from Islamophobia was met with some surprise from the audience.

The report's recommendations for positive change in HE include improvements to data management and the way Islamophobia is reported, plus a dedicated Muslim staff and student support network. The University of Bradford has stated its intentions to include the recommendations of the report as part of its ongoing commitment to tackle Islamophobia in all its forms.

Find out more

Students taking part in Iftar celebrations at the University of Bradford

Presenting about dementia to the Igbo Union Yorkshire CIC – a black African community organisation

Find out more

Communicating dementia prevention measures to Bradford and beyond

At our Centre for Applied Dementia Studies (CfADS) we have a long history of working with people with dementia, their families, and healthcare practitioners to improve care and the quality of life of those affected. Recently our researchers have also started to look at the factors that can lead to dementia and how prevention measures can be communicated to at-risk communities.

Dementia prevention is a recent area of research, with 14 risk factors identified as potential contributors to dementia:

1. Less Education
2. Hearing loss
3. High LDL Cholesterol
4. Depression
5. Traumatic Brain Injury
6. Physical Inactivity
7. Diabetes
8. Smoking
9. Hypertension
10. Obesity
11. Excessive alcohol
12. Social Isolation
13. Air pollution
14. Visual Loss

This is particularly relevant for some of the communities in our region, who are more exposed to these elements due to their social and economic backgrounds. But these risk factors aren't necessarily being communicated, as Dr Danielle Jones, Associate Professor in the Centre for Applied Dementia Studies explains:

"We did an interview study with GPs trying to find out what they knew about dementia prevention and the modifiable lifestyle risk factors, such as obesity, diabetes and cardiovascular disease. They all said that they currently don't talk about dementia risk to patients, but they felt that they should, and that they had a role to play in it. This is especially relevant now as dementia is one of the greatest health concerns in the UK, so doctors giving advice could be a meaningful intervention for at-risk patients."

The study was published in the Journal of General Practice and presented at the Alzheimer's Europe conference, and to GPs and practitioners in our region.

It provided the basis for a new project for Dr Jones, DEM Shield, created to examine Brain Health clinics, a new initiative in the UK currently being developed to provide support for people at risk of dementia. Clinics operating currently are working independently to different models, so the new project will investigate their methods, aiming to identify best practice and an optimal model for brain health services in the UK.

Other complementary work in CfADS includes projects by Dr Amirah Akhtar and Dr Emmanuel Nwofe, who are working with health professionals and with community groups to share knowledge and raise awareness of dementia risk factors in British South Asians and black African and African-Caribbean populations respectively.

Holistic approach gives deeper meaning to the experiences of underrepresented voices

Researchers from our Psychology and Sociology & Criminology departments are using innovative methods to explore the experiences of women who have faced violence and other trauma.

The dialogical approach employed in the research uses conversation as a starting point and analyses the potential multiple meanings of the words spoken, using the context of the time and location to give an outcome that is unique to each interaction.

One such study explored how existing in a shared time and space with a collective community (in this case, women who participate in martial arts classes) can strengthen individual self-perceptions. This was achieved by working with Healing Moves, a martial arts programme at WomenCentre Calderdale, for women who have experienced trauma and abuse. The study, known as the MARIANA Project, was run by Dr Nazanin Shiraj, Dr Hannah Intezar and Dr Peter Branney, with support from postgraduate student Ayesha Hussain. Researchers used the Bakhtinian Dialogical approach, an area in which the University of Bradford has world-leading expertise, to explore the distinct experiences and voices of the women as individuals, as Dr Intezar explains:

> "It's a holistic methodology which allows multiple meanings and interpretations, and this appealed to the programme leaders at Healing Moves when we explained the process. They were particularly interested in how we would look at the space where the classes took place and the women's sense of embodiment, that is, the way their thoughts, behaviour and feelings were affected by how their bodies interacted with the environment."

The findings showed the Healing Moves programme provided a space which fostered psychological and physical benefits to the women who participated, and it was a safe, inclusive environment where they could reclaim a sense of empowerment, rebuild their confidence, and regain control over their lives. The programme was acknowledged with a letter from HRH Queen Camilla, and the positive outcomes shown in the study helped to continue its funding, with further plans to expand it into other regions.

Related research by Drs Shiraj and Intezar includes projects working with Iranian women in the UK, looking at their experiences of gender-based violence, and an investigation into the Bradford community's views on honour-based crime.

Women practising martial arts through the Healing Moves programme at Calderdale WomenCentre.

Find out more

Dr Joanna Nichols

Find out more

Ensuring teenage pregnancy is part of Government youth policy

Dr Joanna Nichols, Associate Professor in the School of Nursing, Public Health and Healthcare Leadership, has had a career which has included a range of public health roles before becoming an academic. Her experiences have formed the basis of her research into teenage reproductive health, which has included a recent study reflecting the experiences of young people accessing services during lockdown.

This was published in 'Teenage Pregnancy and Young Parenthood: Effective Policy and Practice' an evaluation of the UK government's strategy by Alison Hadley OBE, a long-term collaborator with Dr Nichols, who was formerly the senior civil servant in charge of the National Teenage Pregnancy Unit.

This is the second edition of the book, as Dr Nichols explains:

"We wanted to update the original research which covered 2015-2018 and look at 2019-2022. I went back out to re-interview some of the people from my previous research and talk about the effects from this period of huge change. The issues raised included COVID-19 and young people's experience of lockdowns, how moving to online services opened up access for some but excluded others, and the ongoing effect of austerity policy and its implications, which all give context for the research in the book."

This research is part of an analysis of the government's approach to teenage pregnancy services following the disbanding of the National Teenage Pregnancy Unit in 2010 which meant the removal of funding and national support. The book was launched at Westminster in November 2024, supported by the All-Party Parliamentary Group on reproductive and sexual health, and going forward Dr Nichols will be part of the Group's advisory panel on teenage pregnancy who will be influencing youth policy decisions.

Dr Nichols' ongoing collaboration with Alison Hadley, and her position as one of the leading academics on the subject, has led to a closer connection between our University and the national Teenage Pregnancy Knowledge Exchange at the University of Bedfordshire. Alison has recently accepted a position here as Honorary Professor in the Faculty of Health and Social Care. Dr Nichols said:

"Working with Professor Hadley here at the University is a fantastic development and we welcome her warmly. It will open up so many opportunities to make positive change nationally and globally, and will feed into our wider research themes of healthy childhood and adolescence at the Institute of Health and Social Care."

UNIVERSITY of BRADFORD

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Bradford research and innovation in numbers 24/25

£14.1m
in new awards

207 academics
engaged in research funding

£7.4m
research income*

5 patent applications
filed to protect arising intellectual property developed at the University.

74 projects
working with external organisations with £2.76m funding

Bradford Scholars Repository of Publications

8,602
articles in the repository at the end of Aug 2025.

366,330
downloads Sept 2024 - Aug 2025.

*Estimated figure at time of publication