VEC VIRTUAL ENGINEERING CENTRE

2022 Innovation Report

Contents

Introduction

DRIVING DIGITAL ADOPTION AND DELIVERING SOLUTIONS SINCE 2010.

The Virtual Engineering Centre's combination of the knowledge, experience, and world-class research has helped hundreds of clients translate R&D into innovation. We empower people to use digital technologies to solve complex industry problems.

The continued results from COVID-19 paired with the disruption to supply chains from BREXIT have brought into focus how essential it is that we continue to innovate and digitalise.

For over a decade the Virtual Engineering Centre (VEC) has been the vanguard for translating cutting-edge R&D into real-world innovation and impact. From its origins in delivering digital transformation for the Northwest Aerospace sector to our projects accelerating industrial digitisation across the North West of England.

The VEC is proud to have created, led and delivered programmes that match R&D across ‘deep tech’ such as AI, robotics, and data engineering with regional regeneration and an emphasis on supporting SMEs, start-ups and blue chips for developing the next generation of products, technologies and services for a sustainable, healthy and enterprising future.

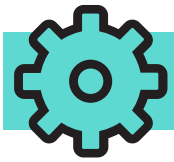
Throughout 2022 it has been a privilege to work with businesses and researchers who are bringing the knowledge, insight, and entrepreneurial drive to build a healthier, wealthier, and more sustainable future for all.

UNIVERSITY OF LIVERPOOL / VEC VIRTUAL ENGINEERING CENTRE

Our Focus

RESEARCH

- Support academics with applied research across multiple disciplinaries
- Serving as a conduit for industry interaction
- Delivering industrial partnerships and research excellence



INDUSTRY

- Contract research/solutions development
- Highly specialised HEI partner on bids
- High-value support to local SMEs for long-term sustainability
- Effective face of HEI to industry

GOVERNMENT

- Leading on policy thinking
- Driving ambition beyond 2.4% and delivering RD&I
- Committed to levelling up Liverpool City Region, Cheshire and Warrington
- Unique paradigm for technology transfer and knowledge exchange
- Value for money, innovative and agile

Foreword

DR ANDREW LEVERS

EXECUTIVE DIRECTOR

Institute For Digital Engineering and Autonomous Systems (IDEAS)

The past 12 months have been extremely busy for the Virtual Engineering Centre (VEC), from collaborating with a whole range of businesses using our unique expertise and unmatched industry experiences, to supporting the launch of a brand-new facility in the heart of Liverpool which will play a key role in collaboration, research and next-generation technology exploration.

2022 has seen the VEC team collaborate on university research projects, upskill the next generation of graduates ahead of their digital careers and explore how digital tools can better preserve our heritage and promote supply chains across the region.

The VEC is thrilled to have supported the official launch of Europe's most advanced multi-participant immersive simulation suite within new Digital Innovation Facility (DIF), which brings together key engineering capabilities from across the University of Liverpool.
The DIF represents a £12.7 million investment from the Liverpool City Region Combined Authority & the University of Liverpool and sits within Liverpool's Knowledge Quarter. The DIF will act as a hub for collaboration, bringing together academics, industry leaders and even students, presenting a real opportunity for all businesses interested in disruptive deep tech and the next in 'digital'.

I would like to take this opportunity to graciously thank everyone for their continuous support over the past year as we look ahead, at what we predict to be a fantastic and prosperous 2023.

UNIVERSITY OF LIVERPOOL / DIF DIGITAL INNOVATION FACILITY

THE LAUNCH OF THE NEW DIGITAL INNOVATION FACILITY

On 23rd May 2022, Steve Rotheram, the Liverpool City Region Mayor, officially opened the University of Liverpool's Digital Innovation Facility (DIF) ↗, a £12.7 million Centre of Excellence in emerging digital technologies, alongside tech entrepreneur and visiting Professor at the University, Sir Robin Saxby.

Located in the centre of the University of Liverpool campus, the DIF provides a purpose-built environment to support collaborations and partnerships between academics, industry and organisations in the research areas of computer and data science, robotics and engineering where the University has world-class research capabilities.

The 1500m^2 facility includes 6 state-of-the-art laboratories featuring cutting-edge equipment and highly skilled support, for facilitating enhanced access for businesses that wish to collaborate with University experts across multiple technology areas including visualisation, robotics, artificial intelligence, data science, simulation and modelling.

Sir Robin Saxby, technology entrepreneur and visiting Professor at the University of Liverpool, said:

"This world-leading facility and team will play a key role in the region's research and innovation capabilities, facilitating industry and academic collaboration in digital technologies with huge potential and opportunities across many sectors. Liverpool's global reach and connectivity will also stimulate what happens here."

Steve Rotheram, Mayor of the Liverpool City Region, said:

"For me, it's a no brainer for us to invest in projects that marry intelligent businesses with local research excellence and help develop this into practical and lucrative new applications.

Our region is home to world-class clusters of research, development, and innovation. I truly believe that we have all the assets, capabilities – and political will – to make our region the country's innovation engine. The Digital Innovation Facility is a perfect example of that in a microcosm.

It isn't just a means of generating economic growth for our region either – but a duty we have to our residents to help deliver well-paid jobs and improved public services. This is a £12.7m investment that will help us do just that."

The VEC is home to a specialist Mixed Reality Laboratory ↗, home to Europe's most advanced large-scale Virtual Reality (VR) Powerwall providing up to three independent viewers with their accurate head-tracked perspective.

This new capability makes the space ideal for collaborative design, object interaction, design reviews or multi-person working. Moreover, with the use of avatars for user representation, solutions can be networked to enable remote experts to join a highly collaborative session.

The Mixed Reality Laboratory also features a large tracked space where physical objects can be located to enhance the simulation experience. Participant and object tracking is represented in high fidelity with sub-millimetre accuracy with the capability to capture the whole body motion of individuals and represent this in real-time through immersive simulations.

Activities within the Mixed Reality Laboratory focus on the solution of real-world industrial problems across all industry sectors, with particular emphasis on the realisation of complex high-fidelity digital twins and testbeds for industrial systems and processes. The experienced MR Lab team consists of visualisation professionals, developers and human factors experts who can not only create virtual experiences, but also validate them.

£12.7m

Centre of Excellence

1500m²

facility

6

specialist Labs

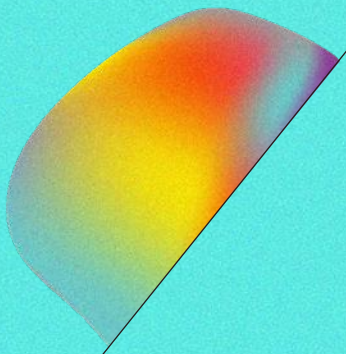
5 x 2.5m screen in native 4K resolution

Europe’s most advanced large-scale Virtual Reality (VR) Powerwall

3

high-end graphic workstations capable of real-time raytracing

LEVELLING UP THE NORTHWEST THROUGH DIGITALISATION



2022 has seen the VEC continue in our support of businesses across the Liverpool, Cheshire and Warrington regions in developing their digital transformation as we lead three exciting ERDF projects (European Regional Development Fund).

LCR4.0 START

DIGITAL TRANSFORMATION AND STRATEGY

Two years on since the launch of LCR4 START ↗, the teams look back and evaluate the progress so far and the value delivered. The £3.9m ERDF initiative has supported SMEs to gain a competitive edge through the development of practical strategies for effective digital adoption.

In just two years, LCR4 START has supported over 140 businesses and 50 start-ups. The project has created at least 28 additional jobs across 10 companies as another 57 companies have realised the opportunity for product line expansion and with the support of the LCR4 START team, have introduced new products to their firm to support long-term sustainability.

at least
28
additional jobs

140
businesses and
50
start-ups

£3.9m
EDRF initiative

LCR4.0 HOLISTIC

DIGITAL SUPPLY CHAINS AND INNOVATION ECO-SYSTEMS

The £5.1m LCR4.0 HOLISTIC ↗ programme is a fully integrated digital innovation support project, providing intensive support to a wide range of organisations beyond manufacturing. LCR4.0 Holistic helps companies to harness the benefits and agility of increased digitalisation, to enable them to adapt their business to become part of a stronger digitally enabled supply chain, better equipped to weather market fluctuations and sectoral changes.

The VEC has led multiple campaigns throughout 2022 which has seen us bring together members of the heritage, maritime and soon, performing arts clusters, discussing how we can work together, highlight and introduce the opportunities for accessing future funding and expanding the sector use of digital technologies for improved security, promotion, preservation, efficiencies and awareness.

£5.1m
EDRF initiative

Cheshire & Warrington
CW4.0

INDUSTRY 4.0 FOR PHARMACEUTICALS, AUTOMOTIVE AND SUSTAINABILITY

Cheshire and Warrington 4.0 (CW4.0 ↗) helps manufacturing SMEs in Cheshire and Warrington accelerate opportunities for growth and investment using digital technology to become more productive, efficient, and relevant to the needs of their customers. CW4.0 is a £5.6 million initiative that covers the full manufacturing sector, from general engineering and fabrication to automotive, renewables, pharmaceutical and medical devices.

The first SME businesses to benefit from CW4.0 have gone on to invest a combined £91,390 in adopting new technologies in addition to launching new products and processes.

The first ten completed projects have seen businesses in the region adopt technologies including Artificial Intelligence, 3D printing, Internet of Things (IoT) and data analytics into their operations. These projects have involved diverse applications, from rapid prototyping and testing of new products to adopting immersive technologies to improve the customer experience.

£5.6m
EDRF initiative

£91,390
in adopting new technologies

Craig Beck, CW4.0 Engagement Lead at the Virtual Engineer Centre, said:

"We are incredibly proud to see the programme has already helped several businesses in key industries overcome challenges and it is exciting to witness academia and industry collaborate to address industrial problems faced by businesses with a regionalised approach.

We are now taking applications for the next cohort of businesses and urge anyone interested in applying to take advantage of this opportunity which offers fully funded support and guidance from an array of experts whilst gaining access to world-class facilities."

All projects are part-funded by the:

European Union
European Regional Development Fund

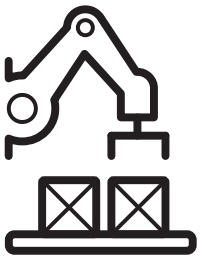
NORTHERN POWERHOUSE
HM Government

Project partners across the ERDF projects include the University of Liverpool, the University of Liverpool Management School Operations and Supply Chain Management group, Liverpool John Moores University, Science and Technology Facilities Council, Northern Automotive Alliance and the Liverpool City Region Growth Platform.

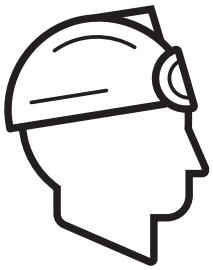
COLLABORATING WITH INDUSTRY

The Virtual Engineering Centre has supported numerous larger cross-sector organisations in utilising digital technologies for harnessing innovation within large scale projects, which can transform their approach and improve growth, investment and opportunity.

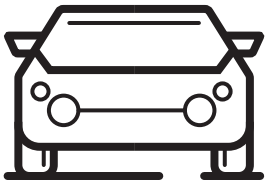
NET ZERO & NUCLEAR



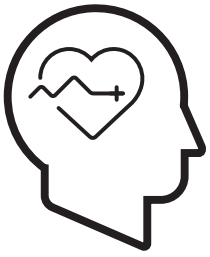
MANUFACTURING



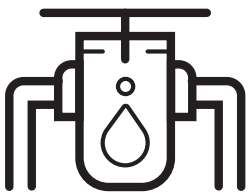
ARCHITECTURE & CONSTRUCTION



VEHICLE ELECTRIFICATION



MEDTECH



SUSTAINABLE UTILITIES

DIGITAL PRESERVATION AND PROMOTION OF OUR CITIES HERITAGE

UK Heritage leaders unite to adopt Deep Tech as a driver for levelling up through digital heritage.

Liverpool is blessed with over 2,500 listed venues, monuments, and sites, second only to London in their quality and scale. It is now intended to create new initiatives to utilise the city's heritage to create "Nodal points of Culture" in every ward of the city. On the 14th June 2022, the VEC launched our partnership and unique strategic initiative with the St George's Hall's Trust, as we aim to establish the Liverpool City Region as a leader in digital heritage.

Digital heritage is the use of technology to improve the understanding and preservation of cultural or natural heritage. The partnership has connected the city region's heritage assets with local SME tech providers, manufacturers, and start-ups for creating a new supply chain that will make Liverpool a world leader in digital heritage.

"When you look at the importance of our heritage, this is a pathway for others to get pleasure from this...this is important to me."

– Lord Mayor of Liverpool, Cllr Roy Gladden

"We need to think of digital as a way for us to level up and innovate… It's not about tech, it's about meaning and finding value."

– Andrew Borland of Virtual Engineering Centre (VEC)

The Digital Heritage Symposium brought together a variety of guests and attendees including technical experts across local SMEs and businesses, architects, theatres, local council members, academics from University departments such as Archaeology, Classics and Egyptology, charities, and even the Lord Mayor, Cllr Roy Gladden. The event explored key themes including how we build a leading digital heritage community for better facilitating remote awareness and accessibility through the cloud and virtual tours, improving education through immersive experiences and enhanced interactivity and engagement in addition to the advantages of digital twin technology and sensors for building monitoring for developing greater sustainability.

The VEC also introduced technology for creating and developing conversational avatars ↗, showcased our 360-degree imagery capture of the beautiful Great Hall ↗ within St George's Hall and how data mapping can be utilised for identifying heritage assets across the city and how these can drive change for combating deprivation across Liverpool.

Download our Digital Heritage Brochure ↗

"The aim is to link the heritage and cultural assets of the city with a variety of indices of deprivation. These can be challenged through cultural beacons."

– Alan Smith, Head of Heritage Preservation and Development for Liverpool City Council

"We want to become a hub of innovation... we want to create a foundry with the support of the Virtual Engineering Centre (VEC) where businesses can build…this can then feedback into our communities."

– Professor Elizabeth Maitland, Trustee

The Digital Heritage Symposium was delivered by LCR4.0 Holistic ↗, a European Regional Development Funded project which aims to deliver the first Liverpool City Region wide digital supply chain ecosystem for SMEs.

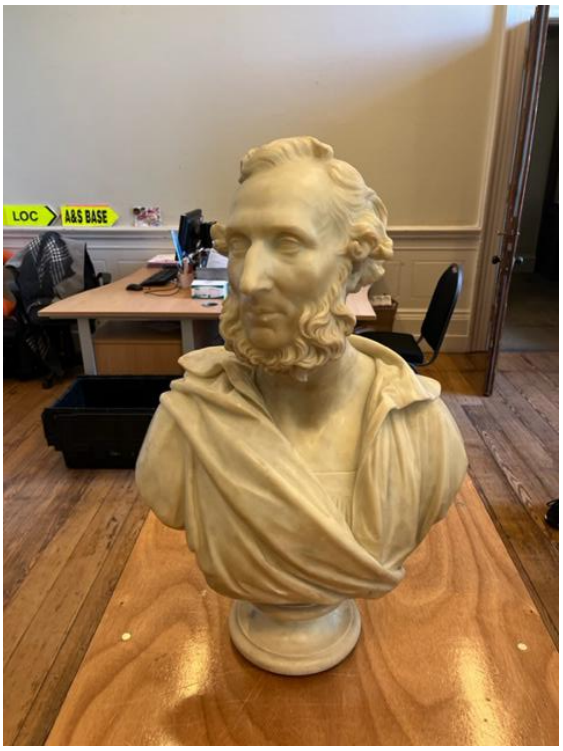
SAFEGUARDING OF HERITAGE ASSETS THROUGH SCANNING TECHNOLOGY ↗

As part of this partnership, St George's Hall has granted the Virtual Engineering Centre (VEC) unique access to numerous heritage assets and sites, where the teams have been able to use emerging digital tools and technologies for capturing specific imagery and data connected to statues, rooms, and properties.

Born in London in 1798, John Weightman had worked on large projects such as the Grand Junction Railway, connecting Liverpool with Birmingham. In 1848, as a corporation surveyor John Weightman was appointed to oversee and support the building of St George's Hall, where he worked closely with Charles Cockerell.

Today, John Weightman's portrait bust sits firmly within St George's Hall. Using light hand-held 3D image scanning devices, the VEC's Industrial Digitalisation teams managed to capture multiple unique images of the statue, building a 360-degree view over just 30 minutes. These images are then compiled together to create a virtual and interactive model of the bust which can sit within digital platforms including websites, enabling remote users to explore every detail without causing damage, offering greater accessibility than ever before.

This scanning activity has not only enabled St George's Hall Trust the opportunity for alternative storytelling of the city's history, but this non-interference method for capturing unique data and records can also reduce the risk of possible damage and time spent.



The Benefits

- Creation of digital assets can reduce the risk of damage to delicate artefacts and other valuable and historical assets
- Interactive images can encourage greater engagement for enhanced learning and understanding
- Contributes to the safeguarding of historical assets, using non-intrusive technology for collating data for more detailed records
- Use these datasets for 3D printing and photogrammetry purposes
- Digitise and classify historic material with AI
- Crowdsource and capture audience interest through the sharing of photos and scans, collating new data and information from an array of sources

WAVE OF INNOVATION

Today the docks and ports of Merseyside are thriving, following a £1bn investment which enables Liverpool to take 95% of the world's largest ships, service four of the world's top five shipping lanes, attract national attention following the development of the famous vessel RRS Sir David Attenborough, and even welcome many cruise lines including the bustling Disney Magic cruise ship.

The successful sector brings £5bn to the Liverpool City Region economy through business turnover, supporting over 48,200 jobs, with a predicted 7.2% growth between 2021 and 2025.

This data suggests there are countless opportunities for local maritime businesses, however, these are continuously matched with pressures for innovation and competitive challenges across new regulations coming into play, the skills gap, security risks and rising costs. The introduction of emerging digital technologies is transforming the maritime sector, improving the speed of processes, product development, data collection and analysis, but many businesses are unsure what the first steps are for their digital transformation.

The VEC leads the LCR4.0 Holistic project and collaborated with Port City Innovation Hub (ERDF projects) to bring a joint opportunity for maritime businesses and SMEs across the Liverpool City Region. The event in October 2022 saw several speakers discuss the importance of digital adoption and explore multiple avenues in which businesses can start their journey. The VEC presented numerous technology demonstrations that highlighted the impact of innovative tools such as artificial intelligence (AI), robotics, blockchain technology and the Internet of Things (IoT) for introducing smarter ports, enhancing security and improving how we can track products in transition.

Download our Digital Maritime Brochure ↗

Predicted
7.2%
growth

LCR maritime economy supports over
48,200
jobs

EXAMPLE

UTILISING COMPUTER VISION FOR RAPID DETECTION AND TRACKING OF MARITIME ASSETS

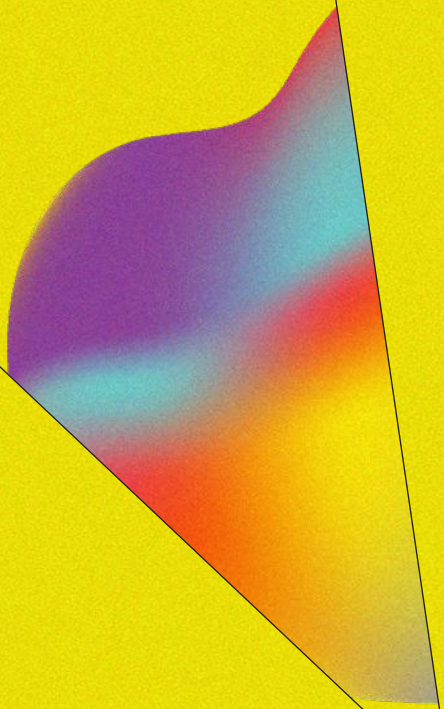
Maritime piracy and illegal importation can have massive economic impacts on nations globally. Rapid developments in computer vision (CV) and artificial intelligence (AI) means we can eliminate the process of manually reviewing security footage in our mission to keep local waters safe through early identification of vessels, people, or even marine life.

With this technology, the process for tracking and identifying anomalies in bodies of water can be automated, which can support the maritime industry in assisting search and rescue missions, border patrol, marine conservation, and national security.

The Virtual Engineering Centre (VEC) have already used these same tools and techniques within an array of other industries such as logistics, manufacturing, and security. Some of these projects have included the use of unique ID numbers, barcodes and QR codes, developing robotic objects for sorting systems and detecting vehicle types in Wide Area Motion Imagery (WAMI).

The Benefits of Adopting Computer Vision Technologies within the Maritime Sector:

- Automation of highly manual work reduces the time and effort spent
- Assist with jobs requiring high levels of concentration
- Improve security levels with early identification of objects
- Ability to autonomously track and count objects
- Provide research analytics through imagery



COLLABORATIVE RESEARCH PROJECTS

The VEC holds strong links with other academic institutions within the UK, the national government, industry bodies and partners throughout the North West and beyond.

The VEC is a multi-disciplinary team including digital engineers, industrialists, technologists, research associates, marketeers and business support. We thrive on delivering creative projects and revel in the application of digital technology to solve real-life business challenges.

SIMULATING ANIMAL BEHAVIOUR TO SUPPORT BITE PREVENTION AND IMPROVE EDUCATION

Dog bites are a growing public health concern, with previous University of Liverpool research finding that adult hospital admission rates for dog bites tripled in England between 1998-2018. A better understanding of human-dog behavioural interactions could help researchers tackle this growing problem but research using real dogs is fraught with challenges.

Since 2016 the VEC has been working with Dr Carri Westgarth's research group (University of Liverpool) in developing a new approach for improving human understanding of canine body language to prevent bites. The Virtual Engineering Centre, in collaboration with Dogs Trust and the University of Liverpool's Institute of Infection, Veterinary and Ecological Sciences have created an immersive 3D environment to demonstrate the value of digital technologies in the identification and education of canine body language related to aggression.

The immersive Virtual Reality (VR) experience allows a person to approach the dog, and as the person gets closer, the dog's behaviour begins to display signs of aggression including licking its lips, lowering the head and body, front paw lifting, growling, and showing of teeth. These behaviours are referenced from the 'Canine Ladder of Aggression' which shows how a dog may behave when it does not want to be approached.

This proof of concept, immersive environment can support academic research into further preventing dog bites. This could then be used as an educational tool, enabling users to better understand animal behaviour, in particular human-dog interaction, and early signs of aggression.

Paula Boyden, Dogs Trust Veterinary Director, said:

"We were delighted to fund the University of Liverpool DAVE Pilot (Dog Assisted Virtual Environment), its potential to provide a fascinating insight into human-canine interactions is clear. We hope that DAVE will be developed into an educational tool to teach people how to be safe around dogs. Before a bite occurs, a dog will often display subtle behaviours to indicate that it is uncomfortable and does not want to be approached. By educating people about these behaviours, we hope that incidences of dog bites can be significantly reduced."

The support meant the Dogs Trust could:

- Improve education around canine behaviour, particularly those highlighted within the Canine Ladder of Aggression
- Explore, identify and highlight early signs of aggressive behaviour within dogs
- Enhance education and prevent future dog bites
- Improve human and dog welfare
- User remains safe and within a controlled environment

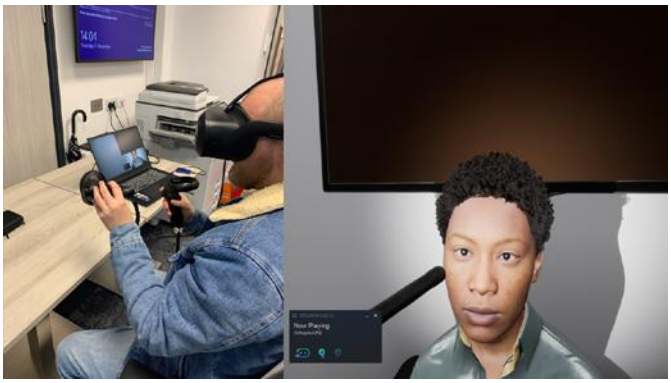
The Benefits

- Realistic simulation that reduces unethical practices
- Improves education and can support in overcoming language and learning disability barriers
- Holds the potential for accelerating learning compared to traditional methods.

DEVELOPING VIRTUAL AND IMMERSIVE TOOLS FOR ENHANCED ORTHOPTIC HEALTHCARE AND ENHANCED LEARNING

The University of Liverpool is one of only three universities across the UK that offer an Orthoptics BSc (Hons) degree. As part of this course, students undertake student placements to gain real-life and hands-on experiences. However, these can be restrictive in the variety of eye conditions that students are exposed to.

The Virtual Engineering Centre worked closely with the department of Orthoptics in developing a realistic simulation where the user is immersed within a virtual studio or inspection room, using high-fidelity Virtual Reality (VR). These high-level quality graphics can improve outcomes, whilst making the learning experience more enjoyable for students.



The VR simulation has also been created to include Metahumans who have an array of different eye conditions. Students can support and assess each patient whilst using a variety of popular and virtual orthoptics tools including a torch, prism sticks, snellen sticks and glasses which can support the virtual diagnosis of patients. This higher level of fidelity allows the simulation of realistic corneal reflections, which is a very important aspect in diagnosing specific eye conditions.

The realism of the simulation will now enable even more eye conditions to be easily flagged and identified, enabling earlier treatment. This engaging interactive teaching tool has already been implemented and used by over thirty students with the hope to extend even further in the near future.

In addition to this simulation, the VEC team created a video to showcase how the simulation works, and how it can be used and to highlight realism, which is a huge improvement to previous methods and the use of a simple 2D application. The orthoptics team have since used this video as a communication and marketing tool which resulted in the team winning a Learning and Teaching Fellowship, an internal University award which can support further funding research and teaching, available to a few selected individuals.

"Initially I thought the simulation would be really hard to use and navigate, however it enabled us to see a real patient with a real condition and having the time to undertake and manage the tests which have really added value."

Orthoptic student,
University of Liverpool

SUPPORTING DIGITAL SKILLS FOR THE FUTURE OF INDUSTRY

The Virtual Engineering Centre offers students the opportunity to gain valuable work experience through our prestigious internship programmes. Students involved have arrived from an array of different backgrounds including Mechatronics, Industrial Engineering, Mechanical Engineering and Computer Science.

The internship enables the acceleration of learning as students are championed by the VEC's multidisciplinary team. Students unlock access to world-class facilities and gain valuable hands-on experience through close involvement in digital transformation projects, supporting small and large organisations across industry, in developing innovative ways of working.

The benefits of the Virtual Engineering Centre internship programmes include:

- Directly support exciting projects across multiple industries and sectors
- Gain real working experience
- Interact with the latest digital technology and state-of-the-art facilities.
- Develop personal knowledge
- Enhance technology skill base
- Improve your employability appeal by standing out from the crowd
- Challenge real business problems such as net carbon zero and supply chain difficulties

Over a few summer months in 2022, the VEC technical teams welcomed 9 interns to work on multiple independent projects which spanned a variety of topics and themes to support them on their own unique career paths:

- New tools for developing a visualisation platform
- The development of a portal to support project management
- Digital tools for visualisation and reporting
- Machine Learning for object identification

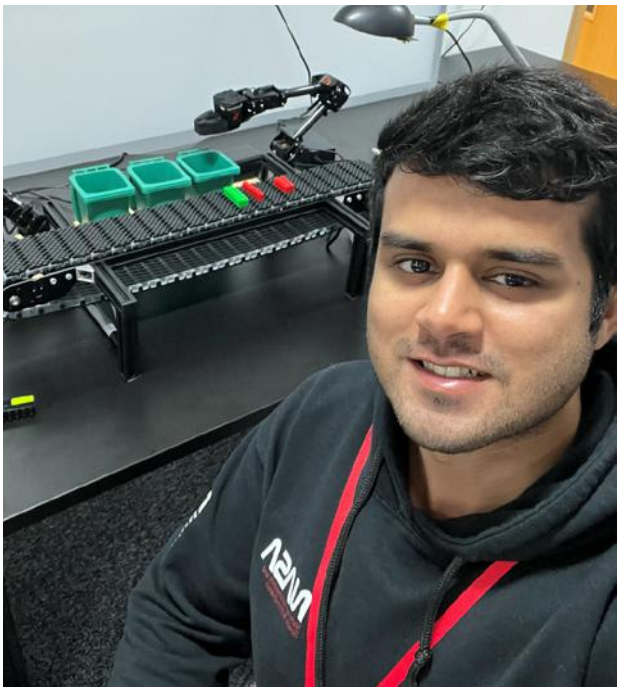
CASE STUDY

STUDENT USES MACHINE VISION FOR OBJECT IDENTIFICATION AND CLASSIFICATION DURING SUMMER INTERNSHIP ↗

INTERN: ADITYA RAMCHANDRA NAIK
SCHOOL: University of Liverpool
STUDYING: MSc Data Science and AI

Aditya was given the opportunity to gain valuable industrial experience as an intern working with a team involved with the development of real-world projects for SMEs.

Aditya worked on a project involving the use of machine vision for classifying objects based on size, colour and QR/barcodes. This machine vision system would then be applied to control a pick and place robotic arm which could have possible industrial applications in the manufacturing, packaging or even the warehouse industry.



"I feel like I can now combine the advantages of OpenCV with Machine learning-based Computer vision models which will greatly help me in advancing my career.

My advice would be to completely brush up on the skills gained through University and try to complement those abilities by doing a bit of extra reading and learning through MOOCs and other learning resources available online which will help the student get the most out of their internship."

The main skills required for completing the project would have to be programming using Python, OpenCV and Pycharm and Aditya furthering his learning with regards to image processing using OpenCV and Robot programming with Python which is not part of the current curriculum at the University.

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Closing word

ANDREW BORLAND

HEAD OF COMMERCIALISATION

2022 has in some ways, been a very typical year for the Virtual Engineering Centre in the sense that we have helped businesses to push boundaries, internally and within industry, showcased how Industry 4 technologies can be widely adopted in the support of more resilient supply chains across multiple sectors and have supported the wider city region goals through local councils and the combined authority as we aim to support Net Zero and other campaigns.

This year has been very special for us as we saw the launch the Digital Innovation Facility (via the Institute of Digital Engineering and Autonomous Systems), offering local businesses a huge advantage for key collaboration and access to world-class facilities and knowledge exchange, on their doorstep.

We now look forward to a huge year in 2023. Some of the key projects we have already started working on really demonstrate the ways in which technology continues to rapidly advance and how industry is now able to further transform the ways in which we approach our everyday processes, becoming more efficient than ever before.

2023 for the Virtual Engineering Centre includes human avatars for improved working training, the utilisation of deep tech through the Digital Innovation Facility as an innovation hub, and lastly, an exciting Digital Twin application which we truly believe will transform multiple industries.

2022 IMPACT IN SUMMARY

- The VEC has led 3 ERDF Funded projects, supporting over 180 SMEs across the North West to level up through their digital transformation journey as the VEC specifically supported 78 of these.
- The VEC welcomed new skills and capabilities to our growing multidisciplinary team including 3D Visualisation, project engineers and digital content development.
- The launch of the new Digital Innovation Centre, applying new research and methodologies with the aim of transforming digital innovation
- Welcomed 9 new interns to support multiple projects whilst developing key digital skills for the future of industry
- Supported and collaborated on 13 larger projects across disciplinaries and sectors including healthcare, aerospace, energy, manufacturing and more.
- Helped businesses across the Liverpool City Region and beyond in tackling Net Zero and supply chain challenges

78
SMEs supported

9
new interns

13
larger projects

Launch of the new
Digital Innovation Facility

AS SEEN IN THE PRESS

Throughout 2022 the Virtual Engineering Centre has been spotted across an array of regional, national and International industry-focused publications from highlighting our support and involvement in ground-breaking and exciting research projects to SME digital transformation projects.

THE MANUFACTURER

Cheshire & Warrington SMEs invest £90k in digital technologies following expert support

Posted on 25 Aug 2022 by The Manufacturer

The first SME businesses to benefit from the Cheshire and Warrington 4.0 (CW4.0) digital transformation programme have gone on to invest a combined £91,390 in adopting new technologies in addition to launching new products and processes.

The cohort of businesses – ranging from a Daresbury-based life sciences start-up, to a maritime engineering company in Tattenhall – have received free, hands-on R&D support through the ERDF-funded project, led by the University of Liverpool's Virtual Engineering Centre (VEC).

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By **Alessandra Pacelli** - 28th September 2022 1136 0

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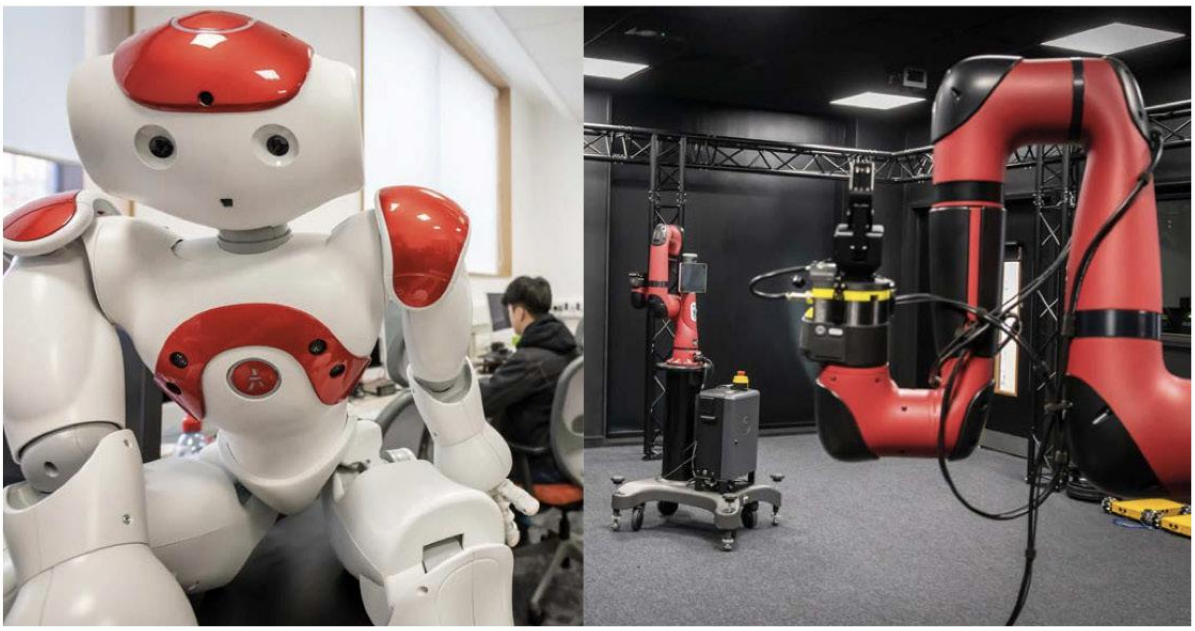


Credit: McCoy Wynne

Digital Innovation Factory, University of Liverpool

ALDERLEY PARK

Cheshire

A Bruntwood Sci-Tech development, Alderley Park is a world-leading science and technology campus and part of the Cheshire Science Corridor. The life science campus offers bioscience facilities for companies focused on research and development.

There are over 250 companies at Alderley Park, spanning areas such as drug discovery, diagnostics, digital health, medical communications and artificial intelligence (AI). These companies range from startups to global corporations such as Sai Life Sciences and Evotec. There is also more than 1 million sq ft of high-specification lab and office space.

The site is currently undergoing a £247m investment, including a £20m investment into biology and chemistry labs, which were launched earlier this year.

MATERIALS INNOVATION FACTORY (MIF) AND DIGITAL INNOVATION FACTORY (DIF)

University of Liverpool

The MIF and DIF are part of the Institute for Digital Engineering and Autonomous Systems (IDEAS) at the University of Liverpool, bringing together world-class academic research and industry in robotics, data analytics and AI. Stephen Leece, operations and innovation partnerships director at the University of Liverpool, says: "IDEAS links these areas of research together with expertise in supporting the adoption of new technologies alongside our partners and external commercial businesses."

The DIF is a £12.7m investment co-funded by the Liverpool City Region Combined Authority's Local Growth Fund. It is a new facility in Liverpool's Knowledge Quarter providing fresh opportunities to assist industry partners in developing research partnerships.

Credit: Martin Birchall Photography

Materials Innovation Factory

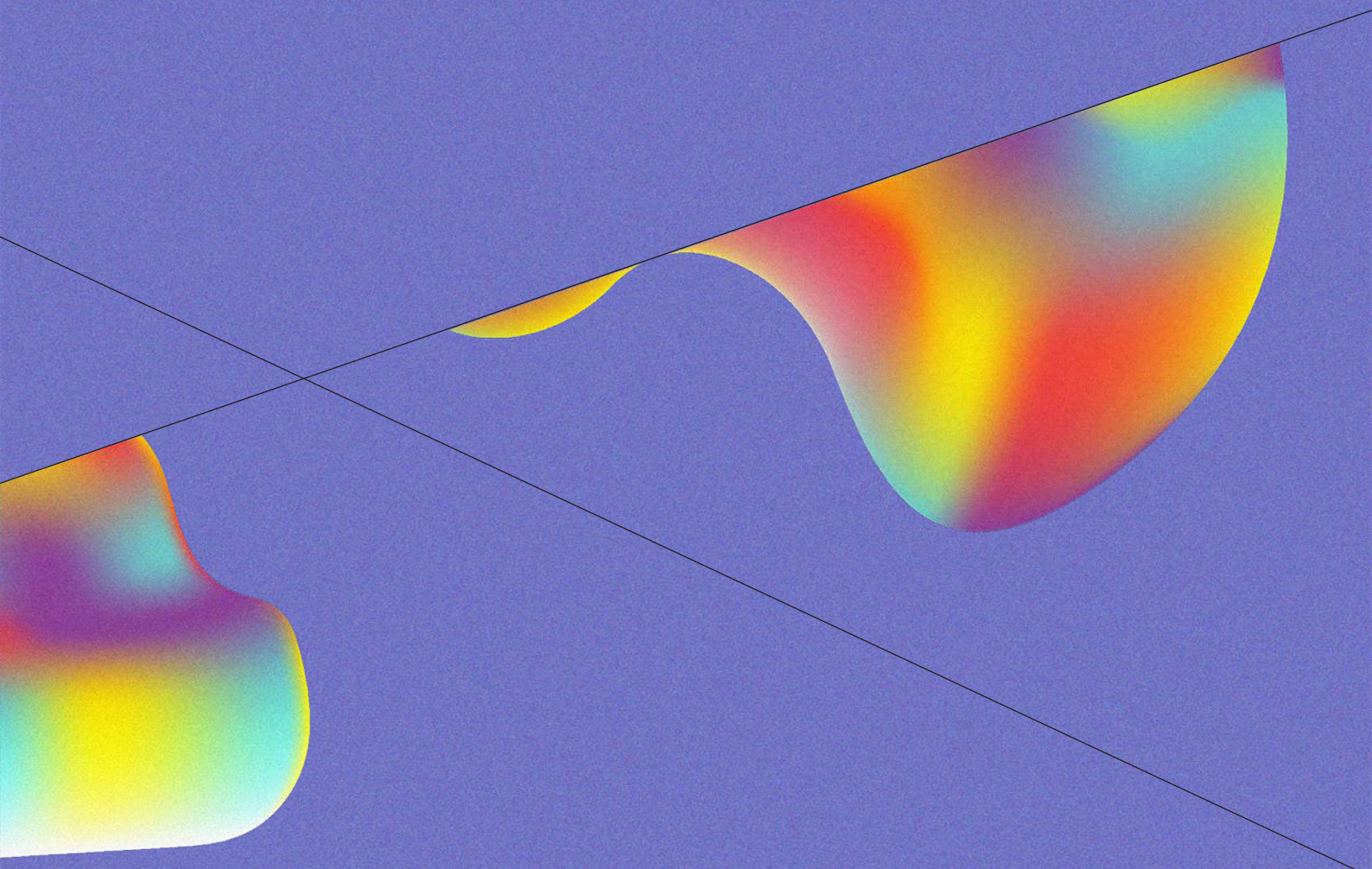
BUSINESSES THAT WISH TO COLLABORATE WITH THE UNIVERSITY'S RESEARCH TEAMS CAN MAKE USE OF THE DIF'S EQUIPMENT IN AREAS SUCH AS DATA ANALYTICS, VISUALISATION, AI, SIMULATION AND MODELLING

Businesses that wish to collaborate with the university's research teams can make use of the DIF's equipment in areas such as data analytics, visualisation, artificial intelligence, simulation and modelling. The facility also features specialist labs: a mixed reality lab, with virtual reality technology; an extreme environment lab,

Insider: DIF and MIF ↗

UNIVERSITY OF LIVERPOOL

/ VEC VIRTUAL ENGINEERING CENTRE



virtualengineeringcentre.com