

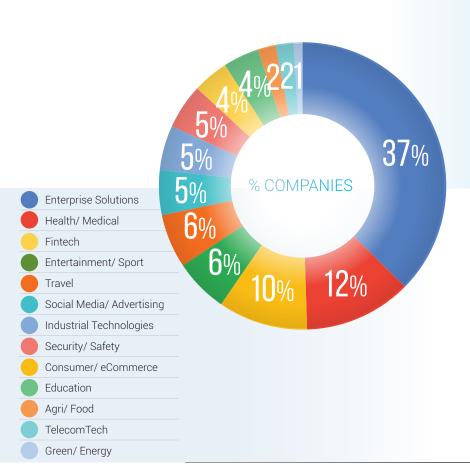


INNOVATION ISLAND

DISRUPTIVE TECHNOLOGIES REPORT 2022

ARTIFICIAL INTELLIGENCE INFOGRAPHIC

AI SECTORS





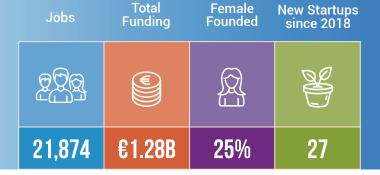


FUNDING

TRENDS











DISRUPTIVE TECHNOLOGIES REPORT 2022 ARTIFICIAL INTELLIGENCE MAP

AI CLUSTERS ON THE ISLAND

TO VIEW ALL AI COMPANIES AND THEIR PROFILES ON AN INTERACTIVE MAP: <u>CLICK HERE</u>





INNOVATION ISLAND

DISRUPTIVE TECHNOLOGIES REPORT 2022 ARTIFICIAL INTELLIGENCE



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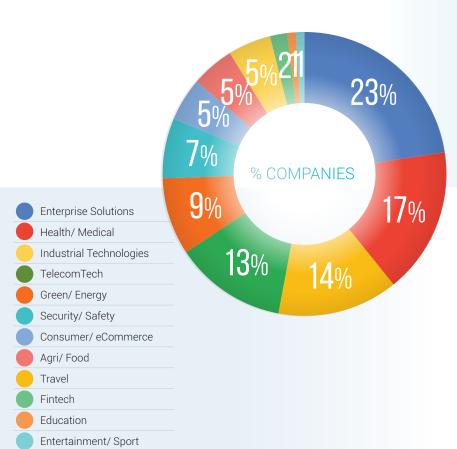


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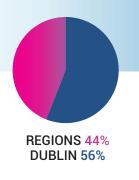
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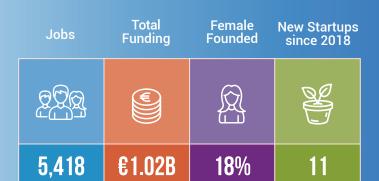






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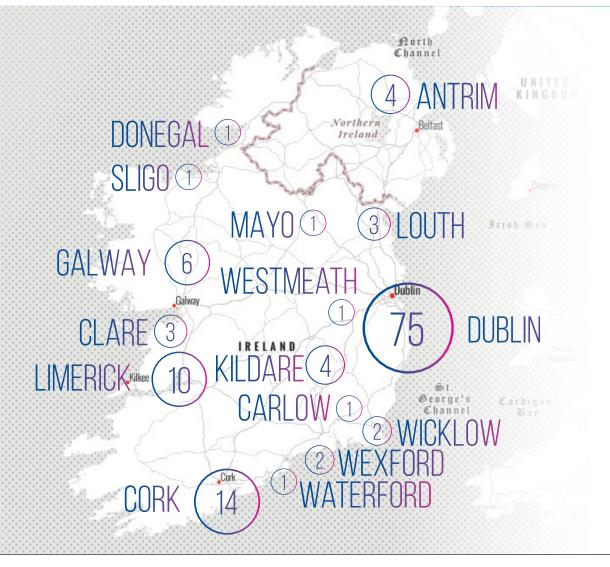




DISRUPTIVE TECHNOLOGIES REPORT 2022 INTERNET OF THINGS MAP

CLUSTERS ON THE ISLAND

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INTRODUCTION

INNOVATION ISLAND

Our world is changing at an ever-increasing pace. Information Technology has been transforming business and society for over fifty years. The internet, e-commerce, online news sites, social media apps – they were all disruptive technologies not very long ago. Now, a new suite of disruptive technologies is transforming well-established sectors, products and services. The metaverse, virtual and augmented reality, artificial intelligence, the internet of things, blockchain technologies, 5G communications, Web3.0, cyber security – these are changing our health systems, our financial sector, our ability to work from home, the way we spend our leisure time. And Ireland is well placed to capitalise on the new opportunities.

There are now almost four hundred indigenous Irish tech businesses engaged in disruptive tech across most sectors — enterprise, health, finance, sport, travel, education, green/environment. Between them they employ over twenty six thousand and have raised almost €1.6billion over the past years. Dublin has the greatest concentration of companies — but there are disruptive tech companies spread across the country. Geography isn't the barrier it once was.

This Innovation Island review of Irish disruptive tech gives an overview of the disruptive tech community. It includes interesting commentary from these experts:

- · Rick Kelley of Meta, on the metaverse and its potential
- Dr Patricia Scanlon, on her experience building Soapbox Labs (a company with AI at its core) and her role as Ireland's first AI Ambassador.
- Cathy Craig on how her business, INCISIV is combining the power of immersive technologies and neural analytics to help people move better so they perform better.
- Ronan Furlong on how DCU Alpha is nurturing Al-related start-ups and initiatives, across a range of verticals.
- Camille Donegan and James Corbett, of Eirmersive on the huge potential for Ireland presented by the immersive economy
- Mark Maguire of Bit2Me on Building knowledge about Blockchain and Cryptocurrency
- Brian Sexton of Sitenna, on supporting 5G rollouts to deliver a worldclass telecoms infrastructure
- Imelda Lambkin of Enterprise Ireland, on the Disruptive Technologies Innovation Fund that is now open for Applications

Thanks as always to our contributors and to Meta for sponsoring this publication and to our Foundation Partners - Enterprise Ireland, IDA Ireland, Google and InterTradeIreland for supporting our work. If you are seeking to connect with the Tech sector in Ireland or Northern Ireland, we are always happy to help.



JOHN O'DEA TechIreland









METAVERSE -AN IMMERSIVE UNIVERSE!



RICK KELLEY HEAD OF META IN IRELAND AND VP OF GLOBAL GAMING, META

What is the metaverse? If the internet of today is something we look at, the metaverse of tomorrow will be an internet we're inside of. It will be a set of digital spaces, including immersive 3D experiences, that are all interconnected so you can easily move between them. It will let you do things you couldn't do in the physical world with people you can't physically be with.

How are we building the metaverse? We are only at the start of this journey and a lot still has to happen before this vision of the metaverse becomes a reality. Hardware needs to be built and easily accessible. Our teams at our Reality Labs office in Cork are investing time into researching and developing new technologies that will help build devices for the metaverse. There also needs to be major breakthroughs in artificial intelligence, and we're seeing our teams make advancements on Al. For example, we've built the Al Research SuperCluster (RSC) — which will be the fastest artificial intelligence (Al) supercomputer in the world when it's fully built later this year. We built the first-of-its-kind tool, automatically animating children's hand-drawn figures - bringing them to life in a matter of minutes, a new tool called BuilderBot enabling people to generate or import things into a virtual world by using voice

commands as well as a new system, No Language Left Behind, capable of translating between all written languages. We're also working on a Universal Speech Translator, an Al system that provides instantaneous speech-to-speech translation across all languages.

Building for the metaverse is a collaborative process with



other companies, developers, experts and policymakers. Infrastructure also needs to be transformed and connectivity across the world needs to increase. Which is why, we recently completed the construction of the <u>Havhingsten subsea cable system</u>, in partnership with Aqua Comms and Bulk Fiber Networks, which will bring more people online to a faster internet in Ireland and across Europe, creating the infrastructure backbone for companies to build future metaverse experiences.





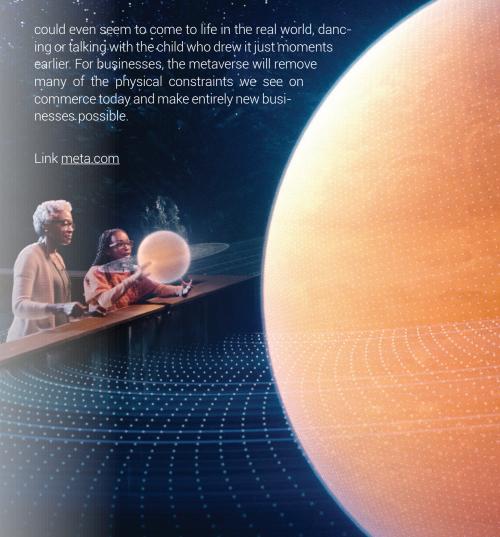




What possibilities does the metaverse hold? The past two years have shown just how important technology is in keeping us connected when we can't be together physically. The metaverse will enhance the time we spend together and create the feeling that we are together in a shared space and with AI breakthroughs, the possibilities are as limitless as the human imagination. Friends around the world could attend the same gig, some attending physically and some beaming in from their living rooms. Family on the other side of the world could beam in for a Sunday dinner feeling like they're right there with you. More people will be able to choose to turn their passions into careers because they won't have to rely on access to expensive tools, workshops or materials in order to train, study or make digital art, games or experiences for people to enjoy. Creativity will transform - perhaps an Al system could take a complex drawing and instantly create an animated cartoon using multiple characters interacting with one another and elements from the background. With AR glasses, those stories















IE DOMAIN **SUPPORTS**IRISH DISRUPTIVE TECH



DAVID CURTIN

The pandemic has acted as a digital accelerant over the last two years, driving adoption of new technologies in Ireland. Use of artificial intelligence is no exception with businesses driving efficiencies by automating their processes and providing unique digital experiences for their customers, making them more competitive and agile. As consumers, we also see the increased use of AI in our everyday lives from personalised streaming recommendations to smart home devices. In our .IE Digital Town Awards, which celebrate local digital projects in towns across Ireland, we observed AI being used in winning digital projects including assisted living for the elderly and environmental monitoring. It is an exciting time for technology in Ireland and we look forward to seeing the continued positive benefits of AI on our society and economy.









DEMYSTIFYING AI — A GREAT CAREER AND A FORCE FOR GOOD



DR PATRICIA SCANLON
SOAPBOX
& ALAMBASSADOR

I was honoured to be <u>appointed by the Government</u> as Ireland's first AI Ambassador¹. The future of technology will see us move from frequent, daily touchpoints to more deeply integrated digital experiences. AI already influences so many facets of our daily lives and has the power



to deliver an enormous and positive impact for both businesses and society, once the benefits and potential risks are understood.

To compete globally, we need to equip Irish companies with a deep-

er understanding of AI systems, how AI can help them to offer more advanced and differentiated solutions, save costs, scale faster and ultimately, compete more effectively on the global stage.

Al is at the core of the company I founded in 2013, <u>SoapBox Labs</u>. We build voice Al that understands kids of any age or accent, Al that empowers them to use their voices to shape their digital experiences

at home, at school, wherever they are.

SoapBox advocates for joyful and immersive, safe and protected digital environments for kids. We believe deeply in the power of voice





Al, and Al in general, to improve kids' lives and every day we invest energy and resources into educating and supporting ethical Al wherever it's found for the benefit of kids and their parents. From the founding of SoapBox in 2013 we invested in our now market leading privacy-by-de-

¹ The appointment of an Al Ambassador is a commitment under the two policy documents <u>Al – Here for Good: A National Al Strategy for Ireland</u> and <u>Ireland's National Digital Strategy, Harnessing Digital: The Digital Ireland Framework.</u>









sign approach to collecting, storing and processing children's voice data. We've also worked hard to ensure our AI models mitigate bias so that every child's voice can be understood equally. Our approach to ethical voice AI has helped us secure partnerships with some of the world best loved education and entertainment brands for kids, see our website for more details.

I see a clear opportunity for Ireland to become a leader in advocating for and adopting an ethical approach to AI that puts humans first. Building such a trusted brand for Ireland in a fast paced AI world will help differentiate us in the market as well as helping to ensure we maximise the benefit of AI in our daily lives as individuals and communities across the country.

As AI ambassador, part of my role is to encourage Irish business leaders to take the ethical AI approach, not because regulation compels them to, but because it's good for their businesses, brands and reputations.

I also am excited to hear the views of young people about the role they believe AI should have in shaping their futures and the future of Ireland in the coming decades.

Link soapboxlabs.com

















VR HELPING PEOPLE TO MOVE BETTER AND LEARN FROM THE BEST



PROFESSOR CATHY CRAIG

For over 20 years I have been researching and developing a brand of behavioural analytics to unlock the secrets of why we move, how we move and why sometimes we can't. I was one of the first in the world to use virtual reality to control what the brain sees and measure how the brain responds. I have worked with elite athletes in many different sports (soccer, handball, cricket, and rugby) but also children with autism, older adults and people with Parkinson's. In 2018 I co-founded INCISIV. Our platform combines the power of immersive technologies and neural analytics to help anyone move better so they perform better. CleanSheet, our first product, measures and improves decision-making in soccer and field hockey goalkeepers. Although originally designed for elite sport, this February we launched CleanSheet on the Meta AppLab which is now being played by over 20k budding goalkeepers.

We can harvest this performance data to identify talent in the 4 corners of the world (we even have a handful of users in Uzbekistan).

In addition to improving performance, we also developed a product to help injured players return to the pitch quickly and safely. Injuries, medical treatments, and lifestyle all affect our brain's neural fitness (AQ). Conventional neural assessment often relies on human observation and misses tell-tale signs of change. MOVIR is a state-of-the-art neural assessment for all kinds of sport injuries including concussions. It removes guesswork by providing an objective measure of what's 'normal' for any individual, a key factor when determining if it's safe to return to play. Our technology can also provide customisable 'serious' games that can train



upper and lower limb function to improve compliance, track recovery and transform the rehabilitation journey.

We are fortunate to have very close ties with Ulster University but also be part of a vibrant tech and start-up community in Belfast. The city is now home to so many exciting startups with a science or medical focus like INCISIV. Largely it is due to the city's funding programmes and the tight-knit entrepreneurial community centred around the coworking space and tech hub <u>Ormeau Baths</u>. There's also an interesting

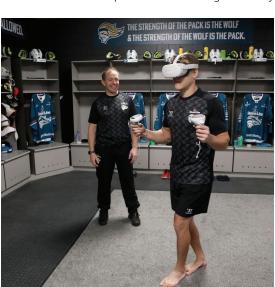






merging of funding in technology and the arts. INCISIV was partially funded by Future Screens NI and NI Screen, which is more associated with funding film and theatre.

INCISIV will continue to create VR applications where performance can be captured and analysed. The future of eSports will be VR games that embody the fundamentals of sports related skills so that someone in Ireland can pit themselves against anyone in the world. By



creating this kind of platform that harvests performance data, VR can help anyone move better, learn from the best and achieve their true potential.

Link incisiv.tech











NURTURING SOME INTERESTING AI-RELATED START-UPS



RONAN FURLONG
DCU ALPHA

DCU Alpha is seeing strong growth in AI-related start-ups and initiatives, across a range of verticals. This is being driven largely by proximity to the Insight Centre for Data Analytics research footprint in DCU, as well as by the (pre-COVID) presence of the Intel-Movidius 'Edge AI' incubator programme that was based in the <u>Talent Garden</u> facility here. For example, <u>Luna Systems</u> is an AI/computer-vision start-up that has developed safety technology for micro mobility vehicles (shared, subscription based and owned e-scooters, e-bikes etc), similar to how ADAS works on cars. The Luna AI can tell if a scooter for example, is riding on the footpath, is parked in the correct corral, or is in danger of colliding with pedestrians.

Also, <u>Ubotica</u>, a DCU Alpha space-tech company, has recently raised €4m in a funding round led by Atlantic Bridge. The Ubotica 'Cogni-Sat' platform is built on proprietary computer vision software and Al system integration, and has already been flight proven in space projects with NASA's Jet Propulsion Laboratory and the European Space Agency's (ESA) Φ-Sat-1 programme (Artificial intelligence for Earth observation).

Finally, <u>Digital Gait Labs</u> is a spin out from the Insight Centre with a new AI tech called 'GaitKeeper', which has recently been clinically validated by Tallaght University Hospital (TUH). Gaitkeeper is a digital application which measures changes in a person's walking, using novel Artificial Intelligence computer vision algorithms to quantify important features of a person's walk. Gaitkeeper does this using a single video recorded on a mobile phone, making it very portable, and very easy to use in a variety of settings.















CAMILLE DONEGAN AND JAMES CORBETT FIRMERSIVE



THE IMMERSIVE ECONOMY – A SECTOR WITH HUGE POTENTIAL

A recent report on The Irish Immersive Economy² prepared by Eirmersive & Pivotal Edtech, found that the Irish Immersive Technology sector is worth over €43 million and employs over 750. Moreover, it is a sector with huge potential. "It is a well-connected, thriving, and outward looking sector ready to take up a global opportunity". Irish immersive businesses are exporting to Europe and internationally. Eirmersive, the voice of the immersive sector, aims to position Ireland as a global player in Immersive Tech by connecting our thriving high growth, hi-tech and start-up ecosystem with our AR & VR sectors.

There's a vibrant immersive ecosystem in Dublin with increasing numbers of regional hot spots. There are clusters emerging across Ireland. "These clusters have the potential to unlock much needed support for this nascent immersive tech sector, driving greater connectivity between businesses and sectors and in turn fuelling new innovation and R&D."

In addition to in-house research in large technology firms, there are several research groups specialising in immersive technologies in third level institutions, particularly in Dublin, Waterford, Cork and Limerick.

Despite the vibrant ecosystem, there are challenges. A shortage of skilled people, difficulty accessing funding, low market awareness and a low level of investment in accessible facilities are barriers to growth. Despite high profile success stories there are low levels of Venture Capital investment, probably reflecting the nascent market. Executives from major technology companies also believe that Ireland is at a relative disadvantage in the Immersive Technology Space.

Solas VR uses virtual reality to deliver a mindfulness experience. Ireland has proven to be a good place for a company like Solas to start and scale. "We have been supported by our local enterprise office and are recognised as an Enterprise Ireland high potential startup (HPSU).

² The Irish Immersive Economy Report commissioned by the Immersive Technologies Skillnet, Animation Skillnet and Screen Skillnet, 2022.















VOLOGRAMS





Based in Dublin's Guinness Enterprise Center, Volograms have built 'a camera for the Metaverse'. Their AI platform enables 3D capture of humans with just a single image.























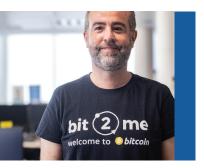












JOSE LUIS CÁCERES
BIT2ME

BUILDING KNOWLEDGE ABOUT BLOCKCHAIN AND CRYPTOCURRENCY

Blockchain, the technology that became popular in 2009 with the appearance of Bitcoin, is now a reality that allows value to be transferred quickly and securely anywhere in the world and at a lower cost than other types of centralised records.

In the financial sector, its potential is becoming a reality, a new form of money based on a decentralised digital currency, backed by a global network of computers around the world.

At Bit2Me we have always been aware that understanding this technology is not easy, so we have invested a lot of time and effort in educating and training our community. For this reason we created the Bit2Me Academy, a virtual space where already today more than four million people around the world have availed of free training courses about cryptocurrencies and blockchain delivered by those pioneers who created the technology.

But that is only the start. This year, Bit2Me launched the CryptoTour, an initiative that aims, to turn Spain into a global hub for crypto knowl-

edge with the help of universities, companies, public institutions and civil society. With the CryptoTour, Bit2Me aims to con-

nect the Spanish education system with the knowledge and training of cryptocurrencies. An idea aligned with our corporate DNA. And we also want the CryptoTour to reach Ireland, a country with a solid financial ecosystem and a prestigious entrepreneurial culture.

Our goal is to have many countries, including Ireland, get to understand more about the technologies underlying cryptocurrencies and to realise how Bit2Me has become the innovative and disruptive company that it is today. Only with education and training will we be able to fight speculation and bad practices in the sector.











<u>Bit2Me</u> specialises in financial technology, blockchain technology and cryptocurrencies. The company is headquartered in Spain and has over 170 staff. They recently opened a base in Dublin.

Link

bit2me.com













5G DEMANDS A NEW MODEL FOR SCALING IRISH TELECOMS ROLLOUTS



BRIAN SEXTON SITENNA

Like many European countries, Ireland is supporting the rollout of next-generation wireless technologies like 5G with a suite of government-backed initiatives designed to cut red tape and foster cross-industry collaboration.

As the home of some of the world's largest technology and pharmaceutical companies, having state of the art telecoms infrastructure in Ireland is key to attracting continued inward investment and providing a springboard for indigenous industries to flourish internationally. Ireland was one of the first countries to make a large portion of dedicated mid-band spectrum available for 5G services and, today, Irish consumers and businesses enjoy a mobile network experience that is competitive with other leading economies in Europe. The success comes despite the unique topographical and population distribution challenges that complicate telecoms deployments on the island, adding significant cost and complexity to commercial network rollouts. Mobile operators, working closely with asset owners and infrastructure providers, as well as with partners in local authorities and government, have navigated these challenges with innovative deployment solutions and collaboration frameworks. Network densification with 5G

is a key priority for the country's mobile operators, who continue to support disproportionately large data traffic volumes relative to their counterparts in other Western European markets. Increased fibre penetration. broader spectrum usage and small cell deployment are all part of a diverse package of mea-



sures being employed by Irish mobile operators to support 5G deployments.



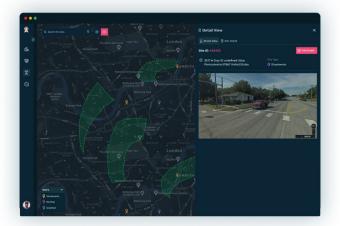


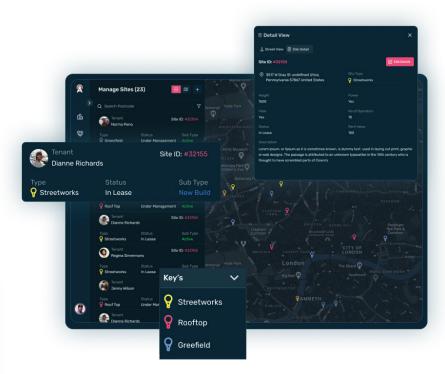


The market and wider telecoms ecosystem in Ireland is now gravitating towards further consolidation and this means the value of collaboration to all industry players will grow. Network densification on the immense scale required with 5G renders traditional deployment strategies obsolete and demands an entirely new model for scaling Irish telecoms rollouts.

<u>Sitenna's</u> new deployment coordination and asset management platform is an innovative, scalable solution to support the commercial viability of the 5G rollouts needed to deliver on Ireland's vision for a worldclass telecoms infrastructure.

Link sitenna.com















DISRUPTIVE TECHNOLOGIES INNOVATION FUND - OPEN FOR APPLICATIONS



IMELDA LAMBKIN ENTERPRISE IRELAND

At Enterprise Ireland we are working on our Innovation Strategy 2020 to 2024, based on the premise that there is a clear correlation between increased R&D investment and improved productivity. Irish businesses range from highly innovative to those that are taking their first steps. Our objectives are to increase the effectiveness and increase the number of clients investing in innovation.

At the high end we administer the Disruptive Technologies Innovation Fund (DTIF) on behalf of the Department of Enterprise, Trade and Employment. It enables innovation at scale and is a huge opportunity for Ireland's researchers. Most importantly it's a collaborative fund so it brings together our SMEs and High Potential Start-ups with large companies and academic researchers to do something unique. It leverages Irish research for commercial impact, enabling companies to compete globally and create high quality jobs here.

Artificial intelligence (AI) has featured prominently in the DTIF projects approved to date, with approximately €50 million (of a total €235 million) dedicated to collaborative research teams in this area. Projects range from health-related applications to the development of novel technologies in law and regulation.

One of the current flagship projects focuses on the future of cancer diagnosis and treatment, combining tissue responsive probes, Al and machine learning to transform medical care. It is led by the <u>Royal College of Surgeons</u> with <u>Deciphex</u>, <u>IBM Research</u>, and <u>University College Dublin</u> in a €5 million collaboration. The project aims to transform the diagnosis and surgical treatment of gastro-Intestinal cancer by using decision-support information for faster and more accurate patient interventions. This DTIF project has played a key role in establishing Deciphex as a leader in pathology diagnostics − they recently closed an \$11.5M Series B funding round led by ACT Venture Capital.

In areas such as AR/VR, DTIF has supported collaborations between HPSU, <u>Artomatix</u>, <u>Black Shamrock</u>, <u>WarDucks</u> and Keywords leveraging AI to automate the creation of 3D models and worlds. While <u>Kinesense</u>, <u>Overcast HQ</u> and <u>Trinity College Dublin</u> have used DTIF for an innovative intelligent video platform that uses AI to enable automated reviewing of video in the criminal justice, security and entertainment markets.

DTIF has mobilised companies of all sizes and the research community to compete for funding – the first time that companies have com-







peted at national level! It involves collaborations between small, medium and large companies and researchers. It's that collaboration that brings real novelty and unique innovations to the projects.

The Fund is currently open for projects in the area of Advanced and Smart Manufacturing, with a deadline for applications of 14 July. This is a huge opportunity for everyone in the Smart Manufacturing sector to help develop and commercialise novel and disruptive innovations with partners from Ireland's vibrant advanced manufacturing sector. The call covers both industrial research and experimental development.

Link enterprise-ireland.com













AI AWARDS 2022 APPLICATIONS NOW OPEN

Applications are now open for the 2022 AI Awards as AI professionals, academics and enthusiasts will once again come together this November to celebrate the great work being done within AI, Machine Learning and emerging technologies in Ireland.

Last year, companies such as ACI Worldwide, STATSports and Webio joined the likes of ESB, Nuritas, Mastercard Labs, McKesson, SAP and much more on taking home one of our coveted AI Awards. In case you missed last year's event, you can <u>watch on demand here</u>.



We are back for our fourth event this year and applications are now open for you to take part. So if you have an interesting product, project or service that utilizes AI, Machine Learning, Deep Learning, Data Science, Automation or other emerging technologies, we would love to hear from you!

We have several categories you can apply for with more to be announced in the coming weeks:

Best Application of AI to achieve Social Good

Best Application of Al in a Large Enterprise

Best Application of AI in a Startup

Best Application of Al in an Academic Research Body

Best Application of Al in a Student Project

Intelligent Automation - Best Use of RPA & Cognitive

Best Application of AI in an SME

Best Use of AI in a Consumer/Customer Service Application

You can nominate yourself, colleagues or someone you know who has a product, service or project that you feel deserves to win an Al Award.

Applications close on 19 August. Nominees will be revealed in October and the winners will be revealed during our awards ceremony in November.

For more information, visit www.aiawards.ie or contact liam@aiawards.ie









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