Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
PHEROSYN LTD	Scaled-up Production and Validation of Midge and Weevil Phermones for Pest Management	£148,397	£66,779
PROCESSORS & GROWERS RESEARCH ORGANISATION		£52,100	£52,100

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Midges and weevils are significant global pests of legume food production. Management of these pests provides a potentially lucrative and growing market in the pest management industry globally, including in the UK, continental Europe, North Africa and North America, where these pest problems are well established. Management of midges and weevils is problematic; the food harvest can potentially be exposed to pesticides when targeting specific stages of their life cycles, and these pesticides may subsequently enter the human and animal food chain. There is a growing global trend to move away from reliance on chemical pesticides in food production in favour of integrated pest management (IPM) strategies. The need for IPM strategies is driven by loss in efficacy of pesticides, reduced availability due to legislative regulation, and environmental issues associated with pesticide use. Pheromones form a critical component of IPM strategies, but compared to other crop pests, there are virtually no legume midge and weevil pheromones currently available on the market.

In this project, PheroSyn will, for the first time, develop synthesis routes for commercial-scale production of the pea midge sex pheromone and pea & bean weevil aggregation pheromone. Efficacy of the pheromone products in trapping and monitoring populations of midges and weevils in legume production systems will be undertaken by the UK Processors and Growers Association (PGRO), a centre of excellence for peas and beans, with a long and highly valued track record of providing authoritative, up to date information and project work based on solid, reliable research. With production capacity and product validation achieved, Koppert Biological Systems, a leading supplier of pheromone products to end-users (farmers and growers) in the UK and continental Europe, will market the pheromones for use in legume production systems from 2021\. Koppert have already confirmed their interest in marketing the pheromone products in these territories.

The project will establish a supply chain (manufacture -- validation -- distribution) for sale of hitherto-unavailable products that are in demand, into the agribusiness sector, thereby disrupting the long-established chemical pesticides market. The project will help PheroSyn accelerate its' business growth, supplying effective, long-lasting, safe and affordable pest management tools to farmers and growers worldwide. Availability of the pheromones for use in climate-smart IPM of legume pests will provide significant social and economic benefit to the UK by producing affordable, safe-to-eat food in a way that promotes zero-carbon agriculture through reduced chemical pesticide manufacture and deployment.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VIVID ECONOMICS LTD	Biodiversity Risk and Impact Toolkit	£952,424	£571,454
NEURAL ALPHA LTD		£572,397	£400,678
The Natural History Museum		£135,897	£135,897

Project description - provided by applicants

Vivid Economics, Neural Alpha and the Natural History Museum have teamed up to combine their leading expertise to address one of the most pressing global issues of this century. Biodiversity protection is rapidly becoming a global priority and addressing the human drivers of biodiversity loss are crucial. The IPBES Global Assessment report concluded in 2019 that around one million plant and animal species are at risk of extinction globally and has called for urgent policy responses to reverse the loss of natural ecosystems, habitats and species. In October 2020, IPBES published the results of an expert panel drawing a clear link between habitat and ecosystem loss and pandemics, with trillions of dollars in economic costs.

The financial sector is likely to be significantly affected by future losses in global ecosystems and biodiversity (physical risk), as well as by the policies put in place to protect biodiversity (transition risk). We are currently seeing rising awareness in the market, as evidenced by the soon-to-be-announced Taskforce on Nature-related Financial Disclosure (TNFD), and by the widespread engagement with financial institutions on the topic through initiatives like the UN Principles for Responsible Investment, UNEP Finance Initiative, and Finance for Biodiversity. As a result, demand from investors for biodiversity-focussed sustainable investment tools is increasing.

The Biodiversity Risk and Impact Toolkit (BRIT) will enable financial institutions and investors to assess whether changes to the natural world and policies to protect it will put their investments at risk, or conversely, generate opportunities. It also enables investors and companies to assess the impact they are having on biodiversity. This allows financial institutions to report their risk exposure to clients, shareholders and regulators; to manage that risk effectively; and to optimally reallocate their financing to avoid the risk. In the last two years, we have seen the market for such analysis mature rapidly in the area of climate change, and demand for similar services is now emerging with regards to biodiversity.

The BRIT meets this demand by deploying state of the art data collection and analysis to link assets and operations in biodiversity-sensitive areas to company supply chains, by simulating the physical and transition risk through spatially explicit scenarios, and by economic modelling and quantifying the impacts on specific markets and the financed companies and assets that form that market.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
UNHINDR LTD	AI-controlled adaptive fitting device for prosthetics and wearable technologies	£353,399	£247,379
Imperial College London		£100,636	£100,636
Manufacturing Technology Centre		£44,610	£44,610

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

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Project description - provided by applicants

"Human body changes shape, but prosthetic sockets don't."

Our bodies are approximately 1.5 cm shorter in the evening, compared to morning. Our feet and hands are larger in the evening. Most of us don't notice these changes because we wear flexible clothes.

However, if you lose a leg, you must wear a prosthetic limb attached to your body with a rigid U-shaped structure called a _socket_. Sockets are made of hard plastics to carry the bodyweight and hand-made to ensure the best custom fit by following the stump's contour. However, 75% of amputees are unhappy because the stump changes shape on an hourly basis while their custom-made rigid sockets don't. This leads to constant skin rubbing causing painful bleeding wounds and ulcers. Replacing sockets up to 4 times annually for the rest of amputees' lives is currently the best solution costing £7.1billion of public money in the UK, EU and US each year (Excluding cost of wound care: £2.4billion in the UK alone(UK-Government/APPG;2019)).

Amputees need a confident and productive life unhindered by their condition, like able-bodied. Therefore, Imperial College London, MTC and Unhindr developed Roliner to make lives of millions independent.

What: Roliner is a sleeve-like device worn on the stump before putting the prosthetic limb on.

How: Roliner uses Artificial Intelligence to understand the hourly/daily changes in the stump and adapts to them. Roliner's AI reads real-time sensors' data between the stump and socket, learns amputees' comfort preferences via an app, and seamlessly and continuously adjust the fitting by inflating/deflating Roliner's micro-channels.

Impact: Prosthetic limb fitting is the biggest barrier for amputees to maintain their daily activities. Amputees live dependent on fitting clinics, and therefore, within the first year of amputation, 1 in 6 amputees lose their jobs. 44.3% working-age amputees are economically inactive, costing £4.89billion in productivity loss(PapworthTrust,2016). Roliner's AI mimicking the clinical practice and providing able-bodied-like walking experience will reduce productivity loss, hospital dependency, and potentially save the NHS £1billion in socket adjustments, £2.4billion in socket wounds.

Due to reduced quality-of life and activity, amputees rapidly lose muscles. The probability of an amputee walking with a prosthetic leg more than 500metres a day is 74% at age 35; while only 34% at age 60, becoming almost wheelchair-bound(Source:Geertzen,Jan et.al;2005-Claimed-walking-distance-of-lower-limb amputees.-Disability-and-rehabilitation). With first-of-its-kind seamless AI-adaptation, Roliner could increase walking performance x3 times, providing able-body-like walking experience. Reducing socket-induced wounds reduces risk of infection, increases mobility, which reduces muscle loss.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
TOKK LIMITED	HAVEnS - High Assurance Vehicle Entry System	£109,100	£76,370
ALBEEGO LIMITED		£137,329	£96,130
BRYANT TECHNOLOGIES LTD		£140,706	£98,494

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
This project focuses on the development of an advanced automotive security system aimed at combating the sharp rise in vehicle theft associated with keyless car technology witnessed in recent years, as passive entry systems become the norm across the automotive industry. The proposed system will be capable of defending against all current passive keyless entry attacks as well as the 'brute force' quantum attacks that are likely to become commonplace as quantum computing technology advances in the coming years. The project brings together a highly experienced consortium with specialists in cyber security, connected mobility, design of specialised IoT RF systems, and communications technology to develop a prototype system, testing 3 distinct architectural solutions (stand-alone hardware, stand-alone software, combined solution with phone as 'black' key) to assess technical and commercial viability. Outcomes are well aligned with the 4 megatrends in the automotive industry and offer a market-disruptive technology with global export potential and wider application within the IoT, Finance and Healthcare security sectors.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
LEHVOSS UK LIMITED	Overprinting with High Performance Polymers (OverHiPP)	£151,826	£75,913
FDM DIGITAL SOLUTIONS LTD		£69,503	£34,752
G.R.M. CONSULTING LIMITED		£267,336	£187,135
Q5D TECHNOLOGIES LIMITED		£260,412	£182,288
University of Exeter		£347,657	£347,657
VICTREX MANUFACTURING LIMITED		£102,919	£51,460

Project description - provided by applicants
OverHiPP will identify, develop and optimise materials and solutions for overprinting features, inserts and conductive materials onto organo sheets and other components, using 5-axis 3D printing technology, coupled with high performance polymers. This will offer a new manufacturing process for many low to medium volume applications, offering improved design options and efficiency savings over existing processes.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
C4 CARBIDES LIMITED	Formation of Super-hard Wear Resistant Coating using Energy Efficient Reactive Laser Additive Manufacturing Technique (REALM)	£431,196	£258,718
CUTTING & WEAR RESISTANT DEVELOPMENTS LIMITED		£123,788	£74,273
UNIVERSITY OF HERTFORDSHIRE HIGHER EDUCATION CORPORATION		£220,927	£176,742

Project description - provided by applicants

The REALM project will develop a new, sustainable manufacturing technology to produce hard-facings for downhole drilling tools. The proprietary technology uses a novel metal additive manufacturing process based on Directed Energy Deposition (DED) to form highly wear resistant hard-facing coatings in-situ, using elemental powders.

The super-hard coating is characterised by a strong metallurgical bond showing a continuous metal-matrix and finely-dispersed carbide precipitates creating functional graded microstructure necessary for wear and erosion applications. This has overcome the drawback encountered when using commercial hard-facing tungsten carbide powders.

The project is expected to deliver three innovations:

1. Automated, low-heat input manufacturing process to form functionally-graded hard-facings; high toughness at the coating-substrate interface and high hardness on the surface.
2. Reactive powder composition formulated using a wide variety of application-targeted material combinations.
3. Design freedom of hard-facings to optimise coating geometries for improved heat dissipation and performance.

The innovative DED process will benefit the environment; the near-net shape process will lead to more efficient application of tungsten and cobalt thus minimising waste of these expensive at-risk commodities. Localised heating using a laser beam will save energy and greenhouse gases. In service, the downhole tool will exhibit higher performance and will lower energy consumption, whilst its higher longevity will reduce the demand for the primary production of "at-risk" metals.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
IGNITE DATA LIMITED	Archer: Enabling a paradigm shift in the way clinical trials are conducted	£499,598	£349,719

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
IgniteData is an exciting, fast-growing UK SME that uses data and technology to streamline key stages of the clinical research process. It provides world-leading software and consultancy services, including its clinical trial data management system, 'Archer', to facilitate the use of data in clinical investigations, ensure correct data transfer and validation and enable clinical studies to be carried out more quickly and cost-effectively. This project will accelerate the development and commercialisation of Archer, IgniteData's 'next-generation' cloud-based digital-health platform (termed a 'Software-as-a-Service' or SaaS). Archer is capable of remotely accessing and transforming patient medical records to enable the rapid, automated delivery of accurate, tracked and validated data to multiple research applications, including critical Covid-19 clinical research. Archer will provide real-time patient level insights to healthcare providers, and researchers. This innovation will allow the transfer of unstructured and structured data from EHRs in secondary care to clinical trial EDC platforms, replacing the manual transcription methods that currently lead to significant time delays, errors and additional costs.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
IN4DERM LTD	Discovery of a first in class oral anti-inflammatory drug for eczema	£420,622	£294,435

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Eczema is the most common inflammatory skin disease, affecting 15-20% of children and up to 10% of adults, associated with substantial morbidity. It is a chronic relapsing condition, with varying frequency and duration of disease flares, in which the symptoms of itching, scratching and infection intensify. There have not been any oral small molecule drug approvals for eczema in recent years, and current treatment options are sub-optimal due to lack of efficacy, side effects or route of administration. In4Derm has discovered a novel approach to the treatment of eczema that we believe will deliver the benefits of methotrexate, without the side effects. We will deliver a prototype drug that is suitable for development and progression into human clinical trials.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SPOTTA LIMITED	Smart monitoring solutions to combat Spruce Bark Beetle and Mountain Pine Beetle	£383,603	£268,522

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Spotta develops specialised systems for detecting, identifying and monitoring insect pests. Insect pests represent a huge cost to the global economy. In this project we will investigate how our technology can be applied to improve decision making in the use of pesticides by providing real-time information on insect populations. This has the potential to dramatically reduce the damage done by insect pests and the costs of treatment. It will also enable a huge reduction in pesticide use (~25%), a reduction in deforestation and the protection of desirable species, such as bees.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
METRASENS LIMITED	PDS-ULTRA: Augmenting Physical Data Security using the World's Most Sensitive Ferromagnetic Detection System	£399,705	£239,823

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants

In 2019, Vishwanath Akuthota destroyed 66 computers in his college in New York using a **_'Killer USB';_** a device that looks like a USB memory stick, but sends high-voltage power surges into the device it is connected to, wrecking computer systems.

'Killer USB' sticks and other small electronic devices highlight the urgent need for physical data security. Further examples include the infamous case of Edward Snowden who leaked millions of highly classified NSA files using a few USB sticks. Similarly, the Stuxnet malware which disabled Iran's nuclear plant was inflicted using a USB drive. In 2018, Omarosa Manigault Newman, a US government official, released recordings of conversations she had with the US President and the White House Chief of Staff. She recorded the conversations with a small recording device.

Preventing such security incidents ultimately relies on the reliable detection and control of storage devices, which have become smaller and increasingly difficult to detect. In fact, independent third-party research has shown the probability of detection using competing ferromagnetic detection technology can be **_as low as 2%,_** meaning most small electronic devices will go undetected, especially in high interference environments such as data centres.

Other detection alternatives such as **_millimetre wave scanners (mmWave)_** cannot penetrate past thick clothing or skin, leaving hidden items in body cavities undetected. **_Static and handheld metal detectors_** require extreme proximity to the screened individual to detect small electronic devices. Waving the detector at an individual is highly intrusive and undesirable especially when screening high-seniority executives in corporate environments.

As a market leader in ferromagnetic detection technology, Metrasens are engaged with major data centre operators. Results from preliminary trials have demonstrated the high possibility of mitigating digital noise thereby significantly improving our ability to detect small electronic devices within environments with high magnetic interference.

This project will focus on creating an ability to detect data storage devices reliably with improved sensitivity. Based on our initial trials, we will develop static and portable prototype detection systems that will be tested and validated in real-world environments, allowing us to satisfy a broad range of applications. This project will open up new lucrative opportunities in the global physical data security sector and enhance our ability to improve our established detection technology for MRI safety, contraband detection in prisons and counterterrorism. **_We will create new domestic and export opportunities, whilst maintaining the UK's reputation in cutting-edge detection technology._**

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
HEXR LTD	Ultra Safe Industrial Helmets	£315,895	£221,126
Imperial College London		£110,578	£110,578

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Industrial workers are at significant risk of severe head injuries, for example the HSE reported 5,400 significant head injuries in 2019 with 60% of all fatalities involved a head injury. Injuries to the head are often life-changing, resulting in long-term damage such as memory loss, behavioral change and spinal damage. The economic cost of these workplace injuries was estimated to be £0.5 bn p.a. and accounted for half a million lost working days. It is likely that the problem is far worse due to poor reporting, e.g. Headway found that 52% of workers who had experienced a head injury did not report it to their manager, with only 6% of those injured seeking medical attention. In order to address the market need for an improved solution, we (HEXR Ltd) in collaboration with Imperial College London (ICL) aim to develop an ultra safe industrial helmet.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
UNITED BIONICS LTD	Development of a low-cost, innovative, easy to apply, sensory rehabilitation device for the monitoring and treatment of Stroke-induced Paresis.	£498,906	£349,234

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
United Bionics (a company spin-out from the Imperial College of Science, Technology & Medicine) has designed a novel medical device for the monitor and treatment of Stroke-induced Paresis. Consisting of an internationally renowned team of bioengineers, United Bionics has proposed a plan to execute their development of a prototype into a readily available medical device. With an Innovate UK SMART Grant, United Bionics is able to complete their final stage of prototyping. After which, they will be ready to conduct registered clinical trials on NHS patients, presenting an opportunity to advance the British economy. United Bionics' enthusiasm and promising medical device, has the exciting potential to improve the stance in millions of Stroke survivors, physicians and carers - across the world.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ROBOSCIENTIFIC LIMITED	Electronic screening for illness using a rapid VOC Measuring system	£141,516	£99,061

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
There is a need for a rapid screening test for Covid-19 and other diseases which is rapid; very low cost; non-invasive; can be applied by unskilled operators and which does not involve the use of any consumables such as swabs or chemical reagents. Roboscientific has previously developed instruments for the early detection of diseases in animals such as poultry, dairy cattle, pigs through the use of electronic instruments containing proprietary high sensitivity sensors which measure the Volatile Organic Compounds (VOCs) given off in breath or other body odours. The "digital fingerprint" of the VOCs is compared to reference "fingerprints" taken from subjects infected with particular diseases. This technology has proven very successful in commercial trials, detecting chicken diseases several days sooner than traditional PCR testing. If this system works with animals it should work with humans. Attempts by others using breath samples, for example cancer diagnostics, have not been wholly successful because of variability of the invasive sampling technique and high moisture content. Roboscientific has potentially overcome the problems by adopting a far simpler, predictable and novel technique for the test. Every health worker; care worker; shop worker, etc. wears a face mask during work. The fabric of the mask adsorbs breath and spit residues containing VOCs. The mask is subsequently put into a small flask attached to a handheld VOC analyser. The flask is electrically heated and the released VOCs are sucked into the analyser and measured for comparison with reference "disease" fingerprints stored in memory. The whole process takes less than a minute.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AURA VISION LABS LTD	Helping brick-and-mortar retailers to profitability; with game-changing computer vision AI on IoT devices	£361,953	£253,367

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants

Brick-and-Mortar retailers are desperate to improve the profitability of their physical stores, now so more than ever in the wake of Covid-19 lockdowns. To quickly recover, retailers will need to measure every aspect of their stores and customer behaviours, to understand what new factors are now affecting sales performance. However, there is no solution that can rapidly scale full-store coverage to \>100 locations, offer the insight quality needed to make successful revenue generating decisions, and suitably protect customer and staff privacy.

Aura Vision has pioneered a unique plug&play AI technology that uses existing security cameras in retail stores to understand how different types of people move and engage throughout the store, and now includes covid-secure features such as social distance heatmaps, real-time occupancy reporting and PPE compliance measures. It fully protects customer and staff privacy and is helping retailers significantly increase their in-store revenues.

In order to make the solution even more cost-effective to scale, Aura Vision is looking to use a new type of cutting-edge hardware that is purpose built for next-generation AI software to process video. This will enable retailers to scale full-store coverage \>100 locations and harness the power of big-data behavioural insights across every store for the first time, to really understand how customers come to purchase their products.

By 2026, we expect to be deployed in a large number of UK locations, providing a boost to the UK's high-streets, helping prevent potential store closures and job losses, and enabling retailers to make their stores more profitable overall.

Aura Vision is a team of 6 ambitious experts with experience in commercialising complex technology. The team is also backed by over 30 investors including Y Combinator, Pioneer Fund and global retail brand ASICS.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ELEVOLT LTD	Elevolt: a self-powered, self-harvesting, passenger lift for usage in the vertical transportation of passengers in all buildings	£493,713	£345,599

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
More people than ever before live in cities. Their potential to deliver economic growth has led to a growing political focus on urban environments in the UK. The cost of installing energy efficiency measures is far lower per property for high rise blocks than other types of housing, and funding retrofit measures on a large scale has proven to be a cost-effective way for energy companies to meet 2050 zero emission targets. One of the highest cost outlays for power within an office/apartment block is passenger lifts. Reducing this cost will allow the owner to drastically reduce their carbon footprint and energy cost. The nature of passenger lifts lend themselves to very high power consumption and inefficient heat/mechanical transfer loss. Elevators account for up to 10% of a building's energy consumption. At present there does not exist a sustainable technology to reduce the large energy consumption of passenger lifts. EleVolt will seek to develop the first truly sustainable lift through this 9-month development project

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PERFORMANCE BIOMECHANICS LIMITED	Biostrain - development of a novel medical device for measuring and stabilising core-muscle imbalances, from lumbar-patients to elite-athletes.	£221,280	£154,896
LUCID GROUP LIMITED		£572,330	£400,631

Project description - provided by applicants
Public description

Public description

Our experienced and proven team is developing Biostrain, a novel medical device to enable clinicians and users to diagnose and treat imbalances in muscle groups known to cause lower-back pain, spinal and hamstring injuries.

This groundbreaking new technology will offer major advantages over current techniques, from a wide variety of users from stroke patients to back pain sufferers, to orthopaedic specialists and amateur & elite sports-people. The market-pull for this solution have been proven through rigorous customer discovery.

The device is simple to use, and will be developed, manufactured & distributed within the UK in collaboration with proven medical device development partner Lucid Group.

Biostrain addresses wider economic and social challenges including UK Industrial Strategy and NHS long-term priorities for preventive healthcare, focus on helping people keep active, reducing susceptibility to debilitating injury. Lower-back-pain increased 12% 1990-2010, particularly in 40-60 year-olds. Resultant production-loss cost were £10,7Bn/year with NHS costs exceeding £2Bn. The project is particularly timely with regard to the Covid pandemic, and the increase in home-working, which is expected to produce an increase in lower back complaints in the coming years, due to poor posture.

Lightweight and portability allows for patient home use whilst clinicians can monitor progression via cloud upload.

In sports, users will be offered a genuine advantage over any other method of hamstring exercise or monitoring. This will enable sportspeople and clinicians to significantly reduce the risk of hamstring injury, improve recovery for existing injuries, and improve performance & speed in healthy athletes.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
The Tyre Collective	Novel device to capture and reuse half a million tonnes of rubber dust created annually by commercial vehicle tyre wear for creation of a circular tyre economy	£397,073	£277,951

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants

Our vision is to transform the one of the most environmentally-damaging resources used in society, vehicle tyres, into a circular economy by reusing materials that currently cause air and ocean pollution, which have a detrimental impact on human health.

In this project, The Tyre Collective will complete development of three critical components of their novel tyre rubber capture device: the cleaning mechanism, storage tank and power configuration. The Tyre Collective will also work with Atlantis Carbon Black, experts in tyre pyrolysis and Europe's leading manufacturer for turning micronized rubber powder into regranulated rubber for tyre treading. We will work together to understand the scalability, manufacturability and commercialisation for reuse of our high grade and uncontaminated powderized tyre rubber. This project completes the lifecycle: capturing tyre rubber particulate matter at tyre source, conducting materials characterisation, matching the material quality to appropriate reuse market and building scalable and route-to-market at speed.

Tyres shed half-a-million tonnes of carcinogenic, toxic carbon dust every year. Accelerating the shift to low carbon transport will increase carbon emissions from tyres as a direct consequence. EVs and ULEVs are heavier and have higher torque, causing their tyres to wear down 30% faster.

![Innovate UK - UKRI logo]

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ATMOS INTERNATIONAL LIMITED	Smart Transient Gas Distribution Network Operations Advisor	£429,380	£257,628

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The UK Government has identified that the UK has the potential to lead the World in the provision of smart energy supply systems and specifically those that match energy supply and demand profiles. Two areas of particular significance are improving the ease and cost of integration of distributed generation and the use of smart systems that integrate energy generation and demand at local, regional or national scale. Atmos International Ltd (Atmos) is a supplier of pipeline operation management systems (including simulation, gas management and leak detection technology) to the oil, gas, water and associated industries. Headquartered in Manchester UK, the company has implemented these technologies on thousands of pipelines in over 60 countries, including major oil and gas companies such as Shell, BP, ExxonMobil, and Total.

The aim of the 'Smart Transient Gas Distribution Network Operations Advisor' (the Project) is to develop and evaluate a new software solution that uses Machine Learning (ML) and Artificial Intelligence algorithms to optimise the operation of gas pipeline networks so that they can operate at minimum cost while meeting the full set of demands of their customers. The machine learning technology will include the handling of unexpected conditions e.g. equipment failure, leaks, sabotage, etc. This approach will match gas supply and demand profiles. The software will enable a supplier to integrate energy generation and demand at local, regional and national scale.

The key benefits that accrue from this new approach are:

- Users of the software will have access to a smart real-time gas network expert advisory system to provide recommendations on how to control their gas transport network to achieve long term improved network performance. It will reduce gas transportation costs whilst ensuring all transport service level agreements/requirements are achieved;

- Faster and reliable decision making will help gas network operators minimise the consequences of interruptions e.g. unplanned station shutdowns or other incidents. This will mean improved safety of people, protection of the environment and gas transport equipment and saving of financial cost. The optimisation provides reduction of fuel and energy consumption. Also, it is both environmentally and economically attractive;

- Maximised utilisation of the pipeline capacity whilst meeting the contractual requirements in event of supply shortages due to unplanned events. This would enable the gas transport companies to maintain or increase sales and avoid penalty payment.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
PROSERV UK LIMITED	Holistic Subsea Cable Fault Detection & Condition Monitoring System	£643,211	£321,606
BPP CABLES LIMITED		£297,952	£208,566
OFFSHORE RENEWABLE ENERGY CATAPULT		£76,977	£76,977
SYNAPTEC LTD		£468,250	£327,775

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Power generation from offshore wind is subject to harsher environments than onshore wind, which can cause greater challenges for the reliability of critical infrastructure. One asset that is fundamental to the economic success of an offshore wind farm is the subsea cable infrastructure. This includes intra-array and export cables, failure of which will lead to significant loss of revenues through failure to export generated power, as well as penalties imposed by regulators. Since 2013, 8 TWh of electricity generated offshore has been lost due to subsea cable faults resulting in £\>1bn of losses for operators. In the offshore wind industry, 80% of the total cost of insurance claims are attributed to cable failures, while subsea cable expenditure only accounts for 9% of the capital cost of a new windfarm. Therefore, better cables or enhanced failure prognostics and monitoring systems are required to reduce the number of detectable cable failures and minimise the lost generation in the event of a fault. At present, no existing system is capable of accurately identifying, locating and offering mitigation in the event that a fault is detected.

SmartCable will bring a radical solution to subsea cable condition monitoring, with Proserv integrating numerous state-of-the-art monitoring systems and the data they generate to provide operators with, for the first time, a complete picture of subsea cable heath for predictive maintenance with cost savings associated with reduced failures, and optimised repair scheduling.

This will enable for the first time a cable monitoring system that can be deployed on subsea cabling for new and existing offshore wind farms. The SmartCable system, to be developed by Proserv will act as a decision-enabling platform to take the wealth of data -- temperature, electro-mechanical, partial discharge and acoustic data from the subsea cable fibre optic and main cores -- and correlate it centrally, developing a new common data language and applying bespoke machine learning algorithms to provide actionable intelligence to owner-operators on cable condition, and detect an operational fault at the earliest possible stage, long before a failure will take place. This will enable effective prediction of cable failure, allowing for contingency actions to be taken to reduce the risk of failure and plan for repairs.

Analysis of the performance metrics and system data during a demonstration at Levenmouth Demonstration Turbine(LDT)will allow the long-term robustness and stability of the system to be validated in an offshore environment and optimised prior to commercialisation.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
EXYO DESIGN LTD	Application Title: Supported Fall Prevention Exergaming, Helping Over-65s Improve Standing Strength and Balance and the NHS Reduce Costs	£355,365	£248,756

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
eXyo is a UK-based SME that intends to address the issue of a lack of effective therapy solutions for fall prevention. This lack is most felt in the over-65 population, a third of whom are expected to suffer at least one fall annually. COVID-19 and the associated lockdown have caused considerable additional strain for this population. eXyo's core team, comprising Andrew Morgan, Christopher Hughes and Jonathan Charlesworth, with experience in product design and development, clinical development and mechanical engineering specialising in rehabilitative technologies, are developing a standing/balance rehabilitation aid that facilitates remote supervision and gamified therapy. In doing so, eXyo proposes a year-5 post-project revenue of £7.2M.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
IMPACT RECYCLING LIMITED	Plastic Recycling in Stochastic Modelling - PRISM	£48,872	£34,210
FAR-UK LTD		£130,240	£91,168
GRANTA DESIGN LIMITED		£85,516	£42,758
IMPACT LABORATORIES LIMITED		£95,139	£66,597

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The aim of the PRISM (Plastic Recycling in Stochastic Modelling) project is to stop highly mixed recycled plastics being sent to landfill or for incineration by creating a market for the materials through the design of robust and reliable products that consider material property variation with probability-based analysis techniques. The project will involve: 1) Impact Recycling and Impact Solutions assessing and developing the plastic waste stream to determine variations in materials properties and to create polymer blends for manufacturing; 2) Far-UK utilising probability-based analysis methods to account for variation in material properties and perform structural optimisation to create robust products; and, 3) Ansys Granta implementing material information management system to store large data sets and create seamless workflows with the experimental and computational developments with the aim of wide dissemination of the PRISM process and data. The project will demonstrate the methodology by designing, analysing and manufacturing a plastic pallet from highly mixed recycled plastic.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Smytec	BlindSite: Blood, Lipid and Illicit Narcotics Detection and Situation	£473,032	£331,122

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

After a serious crime such as murder, physical or sexual assault, crime scenes are forensically examined for body fluids such as blood, saliva, sweat and semen; however, the detection and visualisation of such physical evidence (e.g. Luminol to confirm blood) may destroy or irreversibly change it. Frequently there are other challenges including attempted removal/destruction of forensic evidence, fire, explosion, or presence of other chemicals e.g. bleach which can render many forensic techniques ineffective. Unfortunately, budget cuts, closure of the Forensic Science Service in 2012 and increasing reliance of the police on unregulated experts to conduct forensic testing has left it in a poor state with forensic work fragmented between police forces and providers and R&D in forensic science had stagnated, falling behind with advances in science in contrast to the high-tech public perception of forensic science fostered by popular television programmes.

Smytec proposes to redress this balance with BlindSite (Blood, Lipids and Illicit Narcotics Detection and Situation) a novel imaging technique deployed in a hand-held device that detects bodily secretions, drugs, and explosives. This technology is innovative and completely novel to the forensic testing market. The project objective is to develop the technology to be used by police forces and forensic services to improve the accuracy and efficiency of crime scene evaluation.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BACCUICO LTD	Rapid discovery of novel antibiotics against A. baumannii	£444,900	£311,430

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Antimicrobial resistance (AMR) is a rapidly escalating healthcare crisis, estimated to cause 700,000 deaths globally per year, and predicted to rise to 10Mn by 2050, potentially a bigger killer than cancer and diabetes, combined. Treating AMR currently costs the NHS £180Mn per year. A combination of overuse and misuse of our current antibiotics has led to increasing resistance from bacteria who constantly evolve to resist them meaning our current repertoire is becoming increasingly ineffective. Antibiotics are routinely used in healthcare from minor surgery, midwifery, organ transplants to cancer therapy. If the issue of AMR is not addressed then modern healthcare as we know it will not be possible.

There is an urgent need for novel antibiotics that can target resistant-bacteria responsible for life-threatening infections. _A. baumannii_ is particularly critical due to its resistance to antibiotic-of-last-resort, colistin and high mortality rate \>70%. New antibiotics are urgently needed in order to allow us to enjoy the current standard of healthcare we take for granted. However, high costs of discovery and lower commercial returns compared to other pharmaceuticals have meant that no novel antibiotics have reached the market in ~30 years bringing us closer to potential antibiotic apocalypse as this pipeline runs dry.

The majority of antibiotics in use today have been isolated from soil bacteria. Only ~1% of soil bacteria have been exploited due to difficulties in replicating growth conditions in the lab. ~80% of antibiotics in use, derive from this 1%, representing a $100Bn market. However, this bioresource has now been exhausted. Accessing the remaining 99% has enormous potential as an untapped resource of novel antibiotics.

Baccucio has developed a platform that can exploit this 99%. In this project we will develop our platform so that it is fully automated allowing rapid discovery of antibiotic-producing bacteria. Machine-learning will lead to an increased library size (1200 novel bacteria), with wider bacterial diversity (from 10 phyla). We have an ambitious goal to identify 5-10 novel compounds that target _A. baumannii_.

This will provide a compelling case for further investment from the pharma industry to take identified compounds through to market. Drug discovery costs are a significant barrier especially for antibiotics. As a return we estimate \>€750Mn in annual sales for targeting _A. baumannii_ alone. This aligns with the UK government 5-year action plan to tackle AMR, which includes investing in new therapeutics to re-establish the antibiotic discovery pipeline.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
OPTRICAL LIMITED	Embedded Micro-optic Security Features for Pharma and Other Applications	£322,100	£225,470

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

As per the WHO report it is estimated that 10 to 15% of the world's drug supply is counterfeit and in 2017, 25million illicit and counterfeit drugs were seized by Interpol. Illicit supply of counterfeit medical items specially during a public health crisis can be catastrophic. Healthcare authorities worldwide have therefore developed regulations to counter the supply of fake drugs (e.g., European Delegated Regulation (EU) 2016/161, US falsification directive DSCSA or ISO standard 21976:2018). These regulations make a unique identifier sequence AND a device for the verification of any tampering essential for pharma packaging.

To comply with these regulations, sophisticated serialisation and track/ trace systems have been developed globally over the past few years by assigning each pack a unique identifier. The availability of Tamper evidence features is however limited to security printed "Void" labels, holograms and custom package seals (e.g., NHS drugs are dispensed with self-adhesive labels with cross-cuts which break the label while peeling off), these measures however only apply to external packaging.

In developing countries where medicines are sold "loose" (as individual tablets from a strip) unless the counterfeit measures are implemented on every blister/ strip pack, above regulations are of little significance! The best way of protecting every "tablet" from counterfeiting would be to embed an "easy to recognise but impossible to replicate" security feature in each blister/ strip pack during their manufacturing. Unfortunately, existing security feature like holograms, Fresnel lenses, diffractive features cannot be embedded as surface relief pattern responsible for the effect gets filled up.

This project aims to bring inherently secure "easy to recognise and impossible to replicate", overt, dynamic, anti-counterfeit and tamper-evident features currently used only in high denomination currency notes (e.g., UK £50 and US $100 notes) first-time to pharma industry cost-effectively. Optrical has addressed some of the key challenges in developing this technology for external/ non-consumption applications. In this project we aim to develop the complete process for the production of such embeddable films on industrial scale and test the prototype for health safe/ pharma compliant product suiting the demands of medical industry.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
5AXISWORKS LTD	5XCAM – Next Generation Hybrid Manufacturing Software	£498,568	£348,998

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Digital manufacture predominately makes use of two fabrication processes: 3D printing that builds objects up layer-by-layer in a material additive process, and machining where material is cut away from stock with a sharp tool to shape it into the final part in a subtractive process. 3D printing is a revolutionary technology that allows for easy fabrication of parts with complex geometry. However, the parts often have poor tolerances and a rough surface finish. Machining can produce parts with tight tolerances and superior surface finish but is wasteful of material, where typically 50%-90% of the original material is lost in the process.

These processes can be combined in a new "hybrid manufacturing" process. 5AXISWORKS have developed a desktop 5-axis hybrid machine called "5AXISMAKER", which for the past 6 years was the core product for 5AXISWORKS. Machines like "5AXISMAKER" can combine the strength of 3D printing and the accuracy of machining by 3D printing a near-shape component and finishing it using its 5-axis machining capability.

Computer Numerical Control (CNC) machine tools used in digital fabrication need Computer Aided Manufacturing (CAM) software to create a tool path that the machine will follow to produce the part. 3D printing slicer (CAM) software was a significant contributing factor to the rate of adoption and spread of this technology. Targeted at casual users, ease of use made it a universal tool that could easily fit within any fabrication environment. Software to drive 5-axis machines like 5AXISMAKER has traditionally been used by highly skilled professionals in industries like aerospace. This places suitable software out of reach for most in terms of skill required to operate as well as affordability.

5AXISWORKS will develop a new CAM software program called "5XCAM" that will make hybrid manufacturing as accessible as 3D printing. It will combine 5-axis subtractive and additive functionality of a "5AXISMAKER" machine in a single interface which is as easy to use as pressing a "go" button on a 3D printer. Our aim is to unlock the power of hybrid manufacturing for a wider market by automating labour intensive toolpath creation. Democratisation of hybrid manufacturing will greatly increase the ability of individuals and businesses to innovate and grow, especially through times of economic recession.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
AMPETRONIC LIMITED	Wireless Assistive Listening Solution - Bluetooth LE Audio	£483,307	£217,488

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
For the 1 in 6 people with significant hearing loss, inability to properly engage with audio communications in public environments is often the most disabling experience. Installed public 'hearing assistance' systems make a big difference to quality of life, however current technologies come with major limitations. Most require the user to borrow a receiver and headphones, which is impractical, unpleasant, discriminatory, and does not use the power of the user's hearing aids. Induction loops transmit audio direct to hearing aids which is better for the end user, but can be complex and costly to install, and are limited to hearing aids that are telcoil equipped. This project will develop the fundamental technologies, devices, and infrastructure for a new audio distribution system for public hearing assistance. It will use new technologies for direct-to-hearing aid communication, also allowing simultaneous participation on future smart-devices. The new hearing assistance platform will dramatically improve adoption of hearing assistance and widen access to its benefits.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CRYPTA LABS LIMITED	Development of a Portable Cooperative Intelligent Transport System Beacon	£799,624	£359,831
Coventry University		£238,769	£238,769
Oxfordshire County Council		£98,294	£98,294

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

This project aims to create a new tool to help reduce the amount of road accidents, fatalities and associated costs. Britain's roads are some of the busiest in the world and safety is a paramount concern. In 2019, there were 34,168 accidents and 752 fatalities related to accidents involving a single vehicle hitting an object off the carriageway(DfT_2020c). The economic burden of these accidents is estimated to be £3.6billion(DfT_2020d).

Cooperative Intelligent Transport Systems(C-ITS) have emerged to improve road safety by allowing road users to communicate with each other and with static roadside infrastructure. This technology is currently being piloted in the UK and Europe(EC_2016). The goal of C-ITS is to help reduce road accidents and future fatalities.

This project will utilise existing C-ITS technology to create new innovation for portable beacons that can be easily deployed by road workers and accident response units along the roadway and around the perimeter of road maintenance sites, as well as near hazardous road areas at greater risk of road accidents. This is analogous to a lighthouse warning approaching ships of the hazards of rocks and shallows of the coastline. The beacons will transmit variable messages to inform oncoming traffic of a road obstruction. The goal of our solution is to make roads safer for road users and workers, allowing workers to focus on the job at hand, whether that is building and maintaining our vital national infrastructure or responding to an accident.

We will utilise existing technologies developed by project lead Crypta Labs and subcontractor TeskaLabs, which will be re-engineered to create a portable C-ITS beacon. The beacons will be deployed throughout the road network alongside Oxfordshire County Council, who have expressed interest as first adopters in piloting this innovative technology. Coventry University will conduct a pilot, which will consist of secured ETSI v1.3.1 communications between cars and roadside infrastructure (traffic cones, road barriers, and other portable connected devices) equipped with beacons. During the pilot, we will record communications in the test area between moving vehicles equipped to receive messages from portable roadside infrastructure equipped with C-ITS beacons. Monitoring performance of the C-ITS beacons will allow us to validate that the device is broadcasting at the required specifications and responding as expected under real-world conditions. Following a successful pilot, we will rapidly commercialise our portable C-ITS solutions in a global market, with minimal redevelopment, improving road safety by reducing injuries and fatalities.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
PROMETHEUS REGENERATION R&D LIMITED	Using graphene to generate tissues suitable for joint replacement components	£240,119	£168,083
University of Strathclyde		£101,613	£101,613

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Arthritis is a disease of aging and leads to pain, lack of movement in joints, particularly hips and knees, and poor quality of life. The Global Burden of Disease Study 2016 has hip and knee osteoarthritis ranked as the 12th highest contributor to global disability. With an aging population and increasing obesity the number of people in the UK with knee osteoarthritis is over 5 million and estimated to increase a further 30% by 2030\. There is a rapidly increasing demand for treatment of osteoarthritis in young (35-55 years old) high activity patients. These patients are still within their working life so costs to society include the loss of productivity, general and psychological health, as well as those of direct treatment. It is widely accepted that conservative treatment fails many of these patients but that current joint replacement technologies, although very successful in older patients, are not suitable or efficient. Therefore, a new approach is needed to tackle this problem and return these individuals to their chosen lifestyle.

Current knee replacement implants are made of plastic, metal and sometimes ceramics and so cannot, like our natural bodies, repair themselves so they eventually wear out. The operation to replace them, revision knee surgery, is more difficult and more likely to have problems than the first one. Therefore, a knee replacement that did not wear out would be more desirable. To make this a possibility, we will develop the first stage in making tissue structures that can be used to make components that could then replace the parts of the knee damaged by osteoarthritis. This will be by making the correct supporting structures needed for these tissues as they need to be strong enough to be made into components that can be implanted. This will remove the need to use metal, plastic or ceramic to mend the knee joint. This will have other benefits, it should give better movement as it is the same as a normal knee, it should reduce the chances of serious infections after operations as there is no "foreign" material such as metal, plastic or ceramic within the body for bacteria to attach to. It will preserve the current approach to knee surgery so it will also allow patients to benefit from the advances that have been made in knee surgery over the last 20 years which have significantly improved functional outcomes for patients.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
WILLIAM BLISS & SON,LIMITED	SURFACE TREATING WOVEN FABRIC BY LASER ABLATION TO IMPROVE QUALITY	£158,671	£111,070

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Public Description The Bliss-text project will develop a novel and innovative process technology that has the potential to significantly increase the value of British Wool and provide a British made product which will be used in many high-quality fashion products and high technology sportswear. The new technology will mean that thousands of Kilograms of British wool that currently go into landfill or are just left to rot can enter the value chain internationally in an expanding range of applications. The project will look to develop an innovative prototype process which will alter the characteristics of woven British wool cloth so that it can compete favourably with the World's finest cloth.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ST ROBOTICS LTD	Development of an Innovative asparagus robotic harvesting technology (AsparaCut)	£396,138	£277,297
CAMBRIDGE ASPARAGUS LTD		£9,047	£6,333

Project description - provided by applicants
UK asparagus producers are faced with an increasingly uncertain labour market for their time-sensitive harvest, especially in light of Covid-19 and Brexit since harvesting is performed predominantly by temporary overseas labourers. We propose to create an innovative, automated harvesting solution incorporating advanced robotics and artificial intelligence to resemble manual harvest (the gold standard) to overcome labour shortages. A reliable, robust and cost-effective harvesting solution such as the one proposed will empower UK asparagus growers to continue to invest in this high-value, nutritious crop, thereby reducing the reliance on high-CO2 emission imports.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
STEPONE FERTILITY LTD	Delivering at-home access to clinical-standard fertility treatment	£399,039	£279,327

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

This project proposes a solution to the devastating and unfair issue of infertility.

We are developing a treatment solution that provides clinical-standard fertility treatment - regulated, safe, affordable, effective - in the privacy of one's home.

Infertility is a global issue. The WHO predicts 10-25% of women are affected by infertility(WHO_2020). Male sperm counts dropped 52% over the past 50 years(Levine_et_al_2017) and 40% of couples struggling to conceive have 'unexplained infertility'(Nandi_and_Homburg_2016).

Infertility is still taboo. It's not talked about, or taught in the UK sex education curriculum. Consequently, infertility often stirs feelings of shame or failure(Datta_et_al_2016), exacting a toll on individuals and their relationships. A 2014 Danish study revealed couples are 3x more likely to separate when fertility treatments fail(Kjaer_et_al_2014).

In the UK, less than 3% of those experiencing infertility access clinical treatment(LaingBuisson_2018).

NHS-funded fertility treatment is decreasing, leaving many at the mercy of factors such as postcode, BMI and age restrictions, as Clinical Commissioning Groups(CCGs) look to tighten eligibility.

Private fertility treatment is prohibitively expensive; infertile UK-based couples spend an average of £11,378 on fertility treatment(FertilityNetworkUK_2016). Still, people are increasingly caught between societal/career pressures and becoming parents. This leads many women to delay conception until 35+(Harper_et_al_2017), an age at which conception becomes increasingly difficult(Committee_Opinion_2008), and when they become ineligible for fertility treatment in half of NHS CCGs.

Today, there exists a narrow spectrum of clinical treatment options, ranging from intrauterine insemination(IUI; £700-£1,600/round, requiring up to 12 rounds) to IVF(£5,000+/round).

For those who do access clinical treatment, it's highly disruptive, involving frequent trips by both partners to fertility clinics. Some women report that the time spent navigating fertility treatment feels like a full-time job. The majority of people(70%) report some detrimental impact of fertility problems and/or treatment on their relationship(FertilityNetworkUK_2016).

For those without the means to access treatment, many of the alternatives on the market are unregulated and even dangerous. Misleading 'fertility supplements' and at-home IUI kits include speculums and equipment that should be used only by medical professionals.

This project builds on work developing a novel concept for artificial insemination treatment and digital health experience engineered to be intuitive and effective; optimised by a clinical embryologist to be used safely at home.

With Innovate UK support, we will improve access to fertility treatment, providing infertile UK couples with affordable, safe, effective, and convenient treatment.

It's time to empower people to take ownership of their body, fertility journey, and choices.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
COGNITIVE.BUSINESS LTD	AI-Analyst: Next Generation Advanced Pattern Recognition for Operations & Maintenance Supporting Delivery of a Low Carbon Future	£397,789	£278,452
OFFSHORE RENEWABLE ENERGY CATAPULT		£45,440	£45,440
SSE GENERATION LIMITED		£0	£0

Project description - provided by applicants
Considered by many to be the holy grail of predictive maintenance, transfer learning (TL) is the ability to identify failure symptoms (ISO-13379) from one asset and apply them automatically to another. Applied across the thousands of connected plant items in the Industrial Internet of Things (IIoT), it could unleash the sector's potential adding $14.2tn to the global economy by 2030 \[Accenture\]. Breakthroughs in deep learning (DL) solving Big-Data problems, such as accurate image recognition, might provide the impression that DL would enable asset failure predictions in much the same way. However asset failure data is scarce, every asset has unique data signatures, and therefore IIoT is not Big-Data \[Uniper, 2017\]. This is an industrial research programme building upon a successful novel proof-of-concept technology. The AI-Analyst provides automatic modelling, early-fault detection, and diagnosis using TL, practical for O&M requirements; delivering a genuinely unique offering which can be readily commercialised and exported globally to all IIoT connected assets

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
LSTN LTD	A multi-voice-based synthesiser that provides a 'text-to-speech' conversion service that could enable users to access a wide range of custom voices and superior audio quality at an affordable cost.	£326,880	£147,096

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
SpeechKit is a rapidly growing UK SME addressing the need for affordable high-quality custom voices in text-to-speech services. Its founders are using their experience in engineering and entrepreneurship to develop a multi-voice speech synthesiser that takes advantage of new technology to produce high-quality custom voices at a fraction of the price offered by existing vendors. SpeechKit aims to democratise the text-to-speech market by making custom voices available to small-to-medium-sized companies and wider demographic segments.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SPIN ECHO LIMITED	Magnetic Resonance Multiphase Flow Measurement for Hydrogen Pipelines & Oil Field Production	£441,750	£309,225
OXFORD INSTRUMENTS INDUSTRIAL PRODUCTS LIMITED		£25,875	£12,938

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Spin Echo Limited, a UK start-up, in partnership with Oxford Instruments, an established leader in magnetic resonance technologies are developing a new type of multiphase flow meter that will revolutionize the industry.

Spin Echo's proprietary flowmeter doesn't just provide superior real time measurement accuracy at a fraction of the cost to competing technologies, it does it without the use of radioactive material. The flow measurement is also non-invasive, meaning nothing touches the fluid being measured. The flowmeter has no moving parts and has designed for 20 years in service without any need for maintenance and with our patented stay-calibrated technology which autonomously monitors and recalibrates using built in software logic, there is no need for service intervals. Our flowmeter also also does some other pretty amazing things that no other flowmeter on the market can do.

It can measure natural gas mixtures containing concentrations of hydrogen ranging from 0 to 100% within an accuracy range of +/- 1% \[_which is really accurate_\]. This is critically important for introducing clean hydrogen into existing gas network as it means that end users can protect their equipment, such as gas turbines used for electricity generation, from variations in flow composition. It also means that gas qualities can be measured at the point of use, ensuring no one in the custody transfer chain is undersupplied or overcharged for the gas they are using, therefore protecting everyone, including household consumers of gas and electricity from unfair distribution of cost.

The flowmeter is also great for oil & gas production, whether onshore, offshore or subsea. At a level of accuracy and cost that is simply unprecedented, our flowmeters can provide operators with real time data that can drive genuine insight as to how production performance can be improved at every well. The price of the flowmeter is so low that it will be economically viable to install at over 100,000 well sites globally, offering payback in less than 9 months.

At this rate of installation, Spin Echo, in consultation with O&G operators and experts in the field of production optimisation, have estimated that the data from our flowmeters could enable

* Annual efficiency gains exceeding £15B/year
* Reduce emissions output from the industry by over 5MtCO2/year \[that's equal to around 1.5% of the UK's annual emissions\], and
* cut the amount of contaminated process water production by over 150 million litres a day.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ARMADILLO METAL COATINGS LTD	ARMASMART - Scaling Up the Production of a Smart Nanotechnology to Combat Corrosion	£419,168	£293,418

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Armadillo Metal Coatings Ltd., incorporated on 3rd July 2019, was formed to commercialise patented technology developed during a 4-year collaborative research project carried out at Swansea University, part funded, and directed by The Royal Mint, Llantrisant. The key focus was to develop a solution that reduces coin tarnishing, to maintaining brilliance for longer. The technology has been found to significantly reduce corrosion in other sought-after engineering & decorative metal coatings and has further been shown to protect the underlying substrate should the coating itself be compromised (e.g. corroded or scratched).

Armadillo's innovation comprises a metal plating bath additive that forms regular and well-dispersed deposits within a metal coating matrix. The additive comprises nanocontainers loaded with functional molecules that release under corrosive or abrasive conditions to protect an entire metallic coating, right down to the substrate. The nanocontainers can be loaded up with an array of functional molecules, including (but not limited to); anti-corrosive/ anti-tarnish, anti-viral / anti-microbial, anti-UV and flame-retardant molecules. Armadillo products are manufactured using non-toxic, environmentally friendly and cost-effective materials.

Armadillo's market exists because there is a demand from the end user for high performing, non-toxic and cost-effective anti-corrosion solutions - to keep metallically coated products in service for longer. Armadillo has developed its products accordingly, to be sold to coatings appliers. Corrosion is a costly business, accounting for over 3% of the world's Gross Domestic Product, and the impact of corrosion is energy intensive in terms of reduced product lifecycles. Armadillo adds value by providing metal coatings manufacturers with a smart additive. These new generation, smart metal coatings will provide:

* exceptional corrosion resistance - time-to-failure extended ten-fold or more;
* a smart saving for metal coatings manufacturers - no need to invest heavily in CapEx and new manufacturing processes to meet end users demand for excellence;
* non-toxic products that are not subject to intended legislation - future proof;
* a relatively low-cost solution for end-users; and
* novel marketing opportunities - 'a smart coating that senses and responds to its environment to protect from within'.

Armadillo's technology is proven, a preferred supplier (The Royal Mint) has been identified, and initial customer engagement has been secured for anti-viral electroplated copper coatings, with Armadillo's anti-tarnish properties, for door furnishings and other commonly touched surfaces. Here, and elsewhere, market pull has been evidenced.

This Project will allow Armadillo to increase product manufacture to industrial scale to fulfil this already evidenced market demand.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
TERRA TEK STUDIOS LIMITED	Custom technology for scene management, physics simulation and game state	£499,429	£224,743

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Our vision for this project is to enable our sequel game players aged 7+ to experience groundbreaking levels of interaction and real-time 3D physics simulations. We will undertake experimental development of a prototype game engine, in parallel with the development of a commercial project, with the end result being a reusable engine for multiple games in the creative sandbox genre. Sandbox games are architectures for engagement - the more immersive the game performance, the deeper the potential learning. Evidence shows that games of this genre, like global hit game Minecraft: 1. Engage and motivate children with STEM subjects through immersive learning (RAENG, 2016) 2. Teach children coding e.g. Minecraft (Karsenti & Bugmann, 2017) 3. Help students attain learning outcomes (Noelene Callaghan, 2016). The OECD (March 2020) recommends that long-term digital learning be embraced to counter the loss of human development capital due to Covid-19\. The UK STEM skills crisis costs businesses £1.5bn per year (Stem.org, 2018) and the government spent £1bn p/year from 2007-2017 to encourage uptake of STEM subjects (NAO, 2019). A potential education edition of our sequel game, built on the reusable engine, could positively impact 1) long-term human capital globally and in the UK and 2) impact Industrial Strategy (2019) and 3) DofE EdTech Strategy (2019).

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MINVIRO LTD	Developing a Battery Impact Calculator 'MineBIT' to deeply decarbonise battery products required for low carbon economies.	£289,199	£202,439
University of Warwick		£109,419	£109,419

Project description - provided by applicants

The transition to a low-carbon economy is well underway and accelerating. However, low-emission energy and transportation systems, such as Electric Vehicles (EVs) or solar panels, are more mineral-intensive compared to fossil fuel equivalents. As such, mineral extraction is projected to rise by 965% for lithium, 585% for cobalt, 383% for graphite and 241% for indium by 2050 \[World Bank, 2019\] increasing associated environmental stresses.

To deeply decarbonise supply-chains, downstream users of minerals (such as OEMs assembling EVs), need to be able to understand the environmental performance of their supply chains to ensure the technologies they build are not offset by poor environmental performance at mine-sites. To build sustainable, low-impact products, they also need to optimise manufacturing processes, chemical selection and build using circular economy principles (enabling high-grade recycling when products reach end-of-life) whilst still producing premier, competitive battery products.

Life Cycle Assessment (LCA) provides a method to systematically measure impacts of supply chains and dynamically redesign battery compositions (aka low impact _and_ high-performing chemicals) whilst responding to shifts in commodity markets to reduce the carbon footprint of projects. Yet LCA requires excellent data to accurately quantify different impacts for raw material extraction, processing and refining at a mine-site by mine-site level. However, datasets built by the mining community to feed into LCA are often meagre/non-existent undermining their integrity.

Minviro Ltd is a UK SME pioneering world-leading LCA tools to enable the mineral value-chain to radically improve their environmental credentials. The company is a spin-out from the world-class Camborne School of Mines, comprising of mineralogists, mining-engineers and LCA specialists and is currently working with some of the largest diversified mining companies in the world and downstream end-users to ensure raw materials used for the low-carbon economy are sourced at minimal environmental cost.

Minviro's strategic research partner, from the **Sustainable Materials and Manufacturing Group at WMG, University of Warwick**, are specialists in modelling dynamic supply-chains; sustainable materials/manufacturing systems; digital lifecycle management; battery system engineering; new product development; and advanced propulsion systems.

This fusion of experts, will translate amazing British science into a world-beating innovation, building novel and licensable battery impact calculator 'MineBIT', underpinned by data-driven (peer-reviewed) and temporal LCA. This highly novel 'off-the-shelf' tool will fully comply with international standards ISO14040 and ISO14044 and enable non LCA experts across global supply-chains (including OEM's, Tier 1 and Tier 2 suppliers and investors) to source chemicals and dynamically build products with minimal environmental cost.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

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Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
TROPIC BIOSCIENCES UK LIMITED	Development of rice blast resistance using Genome Editing induced Gene Silencing (GEiGS)	£498,661	£349,063

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Rice is a staple food source for over half the world's population and the main source of income and employment for over 200 million households across the world (Asibi_et_al_2019). World rice production is forecast to reach over 500 million tonnes in 2020 (FAO_2020). However, rice production cannot meet increasing global demand, with the world population projected to reach 8.5 billion in 2030 (UN_2019). Rice yields are also decreasing as a result of climate change and rising temperatures; each 1°C rise in global mean temperature is predicted to reduce the global rice yield by 3.2% (Zhao_et_al_2017).

Today, 30% of rice production losses globally (which could feed 60 million people; Nalley_et_al_2016) are caused by rice blast, a pathogenic fungus that can cause total crop failure and is found in all rice-growing regions (Wang_et_al_2014). The appearance of new and more virulent strains of rice blast are challenging for traditional management and control methods such as fungicides and plant breeding (Asibi_et_al_2019).

Tropic Biosciences is developing high-performing commercial varieties of tropical crops (such as banana and coffee), which promote cultivation efficiencies, enhance consumer health, and improve sustainable environmental practices. Our approach relies on proprietary and patented cutting-edge genetic editing technologies, developed in house. With Innovate UK support, we will extend our world-leading gene editing technology to the development of rice blast resistance, building our portfolio in rice.

Headquartered at the renowned Norwich Research Park, with access to world-leading facilities, Tropic Biosciences was founded in 2016 by a team of highly experienced entrepreneurs and academics, including: CEO Gilad Gershon, experienced AgTech private equity investor and entrepreneur; CSO Dr Eyal Maori, scientific co-founder of Beelogics, which was acquired by Monsanto in 2011; and, CTO Dr Ofir Meir, former Head of the Agro Chemistry Division at Rosetta Green, acquired by Monsanto in 2013\.

We now employ a team of over 80 industry-leading experts. This year, we closed a £22.5 million Series B round of equity funding (the largest ever funding round in the UK AgriTech sector) to accelerate our growth trajectory through field trials for our novel banana varieties and to further commercialise our proprietary Genome Editing induced Gene Silencing (GEiGS) technology platform.

This Innovate UK project extends our work to rice for the first time. By achieving a sustainable increase in rice production, this project will improve global food security and contribute to poverty alleviation, in the face of global population growth and climate change.

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Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
XAMPLA LTD	Development of bio-based and dissolvable sachets for home and personal care applications	£470,897	£329,628

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants

"Just-add-water" homecare products are growing in popularity, with cleaning products shipped in concentrated form enclosed in dissolvable single-serve sachets for dilution at home, offering maximum convenience and sustainability. Since 90%+ of cleaning products is water, shipping water-free concentrates can reduce logistics-related energy, plastic waste, and carbon dioxide emissions by 80-90%.

However, at-market "just-add-water" products rely on water-soluble plastics such as polyvinyl alcohol (PVA). PVA is low-cost, lightweight, strong, durable, and transparent, with excellent barrier properties that meet the technical requirements for homecare applications such as laundry detergent pods and dishwasher tablet pouches. However, although PVA rapidly dissolves in water, it is non-biodegradable and potentially releases microplastics, defined as synthetic polymeric particles 100 nm to 5 mm in length.

It is estimated that between 15 and 51 trillion microplastics have accumulated in our oceans. When ingested by plankton and fish, microplastics enter the food chain, ultimately reaching humans; indeed, microplastics have been detected in human faeces. The impacts of microplastics on the environment and human health are still poorly understood; however, since they persist and bioaccumulate in the environment, it is recognised that there is no safe threshold for their release.

Ultimately, despite years of research and multiple solutions in development, the search for a bio-based and biodegradable material to replace PVA has remained limited by three key factors: poor performance in use (shelf-life stability, mechanical strength, barrier properties); high raw material price; and, lack of low-cost, scalable, and sustainable production processes.

The development of a bio-based and biodegradable material that could match performance, price point, and manufacturability of water-soluble PVA film currently used in detergent packaging could avoid the release of up to 90,000 tonnes/year of PVA in the EU and 400,000 tonnes/year globally.

Inspired by nature, Xampla has developed a next-generation bio-based and biodegradable material produced from plant proteins. By harnessing the natural ability of plant proteins to self-assemble, we have created a new class of materials with remarkable functional properties: Supramolecular Engineered Protein (SEP). SEP can be used to produce a range of materials with highly controlled properties, including water-soluble films.

With Innovate UK support, we will develop our bio-based and biodegradable dissolvable home care sachets as a replacement for laundry detergent and dishwasher tablet pods. We will also develop personal care sachets for zero-waste shampoo and conditioner sachets. The outputs from this project will support the UK's ambition to become a world leader in sustainable packaging.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
XCELLR8 LIMITED	Addressing the need for animal free testing of human acute toxicity	£337,708	£236,396

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

XCellR8 Limited aims to offer the first completely animal-free, _in vitro_ test for human acute oral toxicity prediction, combining a strong scientific rationale with the ethical advantages of a non-animal approach.

In response to the critical need in the cosmetics sector for scientifically advanced, non-animal tests for acute toxicity, XCellR8 developed a Proof of Principle test to show that this could be achieved. Companies in the sector find themselves stuck between two contradictory regulations. XCellR8's test indicates that there is a way to resolve this gap and allow cosmetic companies to test new ingredients, not only to remove the need to test on animals but also to provide a more accurate test for human toxicity than traditional rodent models by utilising human-derived components.

An EC-funded feasibility study confirmed that in order to unlock the full market potential of the test, the predictive capacity and sector applicability should be expanded, significantly enhancing the commercial opportunity. Ingredient suppliers in a range of industries -- notably industrial chemicals, biocides and agrochemicals, and medical devices - expressed an interest in the test, citing similar contradictory regulations in their own sectors.

This Project will enable XCellR8 to develop a new, improved test with features that enhance its predictive capacity, and to ensure its applicability to a wider range of sectors, solidifying the commercial proposition. This will aid in establishing a UK-based SME, XCellR8, as a world leading company for the provision of non-animal technologies for the testing of human safety.

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Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
VECTOR AI LTD	Novel research into language understanding to automate customs and freight paperwork	£386,760	£247,526

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

JP Morgan 2017 trade outlook report estimates that trade-involved Fortune 500 companies incur more than $81 billion of unnecessary supply chain costs each year due to human inefficiencies and lack of scrutiny. Since medieval times, freight forwarders have organized transportation on behalf of a) shippers, by air, ocean or land, and b) carriers, to get physical goods from A to B. The traditional labour- intensive paper driven approaches result in long turn-around times, little formal knowledge capture and high operational risk.

McKinsey consulting report that "in global supply chains, telephones and email are still the dominant channels, just as they were decades ago", and CargoLogik note the "current processes are an immense time and overhead killer... still largely manual ...which result in lost time for freight forwarders and a clunky, poor customer experience." JPMorgan estimates that there are typically 27 highly fragmented document entities involved for every shipment made.

This project aims to develop an expert natural language processing (NLP) based tool, to identify and extract key information from unstructured text found in emails, which will be trained and configured for the logistics sector specific language and email communications. In doing so we will develop technology capable of creating structured rules for cross-checking free-form text in emails against trade paperwork and driving action on the content found within global trade paperwork.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
DOMEBLE LIMITED	The development of virtual reality (VR) 360° immersive content and processes for automotive design and vehicle configurators	£365,842	£234,139

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Domeble is a premium Rights Managed content and image library, licensing photographic high resolution backplates, 360° HDRI domes and VR environments, tailored towards the automotive and product visualisation sectors. We are global leading experts in the arena of 360° high-dynamic-range imaging (HDRI), this a technique used in photography to reproduce a greater dynamic range of luminosity than what is possible with standard digital imaging or photographic techniques and is a vital component in the CGI rendering processes needed to create photo realistic rendering. As experts in CGI, 3D and VR production, we support advertising agencies, automotive manufacturers, creative production studios, and artists in producing creative and technical solutions that showcase leading brands and products. Our professional quality imagery is captured and curated to facilitate the creation of beautiful post produced / rendered imagery for campaigns, advertising and automotive design. From early stage visualisation to global billboard campaigns to immersive tech, our specialist imagery is utilised at the forefront of innovation and recognised industry wide as a quality benchmark in image capture and high resolution quality.

This project involves creating ground-breaking immersive VR content that will enable a step-change in the car pre-sale/sale process, the science of car design, and in the longer term enhance automotive design education and potentially many other industries that will also exploit these real-world immersive experiences.

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Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
DIGITAL SMART SOLUTIONS LIMITED	LearnThat.Today - Smart mobile approach to personalised multimodal learning	£460,741	£322,519

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Sustainable education and corporate training are transforming, with refreshed momentum, driving education towards online student centric learning. Our education ecosystem must adapt to prepare individuals for the changing labour market. At the same time, recent advances in EdTech offer new and potentially more widely accessible ways to access education. The impact of COVID-19 will be a hyper-accelerated growth of the EdTech markets, injecting a massive net shift to B2C education models.

Digital Smart Solutions Limited vision is to develop the next generation of mobile learning with a student centric learning management system that utilises today's technology, providing affordable, customised, and efficient, education & skills training for all. **LearnThat.today** sits within the education technology (EdTech) market which is growing at 16.3% and will grow 2.5x from 2019 to 2025, reaching $404B in total global expenditure (HolonIQ).

Market growth is driven by Higher Education tuition deflation, combined with faster/cheaper credible alternatives. Digitization drives a lower administrative cost base across all sectors, add to this a global student population boom, technology advancements (AI, virtual) and the World Economic Forum expectation that 54% of workers will need to up-skill their digital skills, all drive a huge opportunity for an advanced mobile learning management system to meet 21st Century demands.

With **LearnThat.Today** a smart Multi-sided Intelligent Platform Service (LTT-MIPS), we can exercise the andragogical landscape of lifelong learning; shaping an enduring online environment and creating new learning experiences that engages:

* Self-concept -- Learners being responsible for their own decisions.
* Self-directed -- Controlling their learning efforts.
* Attention -- Learners end to absorb new ideas and concept within 15 minutes (micro-sessions).
* Retention -- Information is retained much better through active forms of learning (storytelling) conveyed in relatively small quantities and then repeated at intervals.
* Collaboration -- Interpersonal /social learning is our most powerful learning process to construct knowledge based on the interactions with others in ways that we may not be able to do on our own.
* Application -- Career goals, skills and competences require certification and non-refutable accreditation.

LTT-MIPS are micro-session Intelligent Multimodal Instructional Courses, incorporating Student Centric services of Support, Collaboration and EDI. Our smart solution manages educational data centrally, ensuring data consistency, immutability, and data security across the globe. This 18-month, cost-effective project will enhance Mobile Learning and deliver: - reliable communications, secure peer-to-peer collaboration, efficient critical learning analysis, accountably and verified examination services, trusted accreditation, and an authentic use of knowledge and information-finding.

Results of Competition: Innovate UK Smart Grants: August 2020

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Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SLICETHEPIE LIMITED	Attribute benchmarking and personality profiling for sonic branding ("Sonscience")	£373,984	£261,789
Goldsmiths College		£66,176	£52,941

Project description - provided by applicants

With the rapid increase of voice-controlled assistants and machines, brands increasingly realise that to have a recognisable, memorable sonic logo (a short musical composition) will soon become as important as their visual logo. As a core brand asset, this sonic logo needs to reflect and reinforce their brand personality in order to build brand value.

This project will create full benchmarking for over 200 personality attributes to enable brands to empirically measure how closely any given piece of music resonates/matches their core brand values (e.g. trust, innovation, freedom etc).

These benchmarks will be created using advanced testing paradigms from experimental psychology for measuring semantic-emotional associations and memorability of audio assets conducted with hundreds of thousands of consumers. Testing paradigms will comprise both implicit and explicit response tasks. The output will be a unique online SaaS interface enabling any new sonic asset to be tested, benchmarked and mapped against over 200 brand attributes.

In addition, the project will create benchmarks to quantitatively measure how memorable and recognisable any musical asset is ensuring that this is optimised for any given project.

The project will create a new gold standard for music testing in the context of advertising and sonic branding ensuring effective and efficient allocation of resources for brands worldwide.

SoundOut will conduct the project in partnership with the world leading academic experts in Music, Mind and Brain at Goldsmiths University in London. Project duration is 12 months, with total costs for partners SoundOut and Goldsmiths University of £440,160\.

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Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
AVEN MEDICAL UK LTD	Novel arteriovenous (AV) fistula device to treat hypertension in drug resistant patients	£444,278	£310,995

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

High blood pressure affects approximately a quarter of adults worldwide. The overall incidence is on the rise and is expected to increase by 60% by 2025\. Having high blood pressure puts people at greatly increased risk of stroke, heart attacks, heart failure, kidney failure and other serious medical conditions. It may play a role in 13% of all deaths worldwide.

The reduction of blood pressure may be achieved by life-style modification and certain drugs. However, only 60% of patients achieve acceptable blood pressure lowering and in the long-term only 20% are well controlled. Between 10 and 30% of patients are resistant to drugs, and around 50% do not take their tablets when specified which reduces the effectiveness. The management of high blood pressure is time-consuming and expensive for healthcare providers-- it accounts for $48.6 billion of healthcare spend in the USA and up to £2.1 billion in the UK.

Aven Medical is developing an implantable medical device (the AveNue) that may be used to reduce blood pressure in patients with high blood pressure where other treatments have failed. The device is like a small rivet with a central hole that is placed by a medical specialist during a short procedure in a hospital. The implant creates a permanent opening that allows blood to flow from the high pressure arterial circulatory system into the low pressure venous system thereby reducing the patient's blood pressure.

The device is in the early stages of development, working prototypes have been produced and laboratory studies have proven it to be technically feasible. The primary focus of this project is to complete human cadaver studies to confirm safe implantation, to complete in-vivo studies to determine flow characteristics and refine the design and to prepare for first-in-human studies of the device.

If successful, the market is massive, we estimate the total opportunity to be in the region of £3 billion per annum. The AveNue device design is based upon a well-known product that has been used in over 60,000 medical procedures and is approved for use in Europe and in the USA. Because of this, we can be certain that the material used (medical grade stainless steel) is suitable. The innovative design feature is the establishment of a permanent passageway between an artery and a vein that allows the reduction of blood pressure.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
TETHIR LTD	WILDFIRE: Enhanced PIR sensors for remote wildfire detection and prevention	£209,636	£146,745
Imperial College London		£52,598	£52,598
King's College London		£70,455	£70,455
PYREOS LIMITED		£178,066	£124,646

Project description - provided by applicants

Wildfires cause catastrophic damage worldwide, accounting for 20% of global carbon emissions. The problem, exacerbated by climate change, is deteriorating. Unusually severe fires in USA, Australia, Spain etc, have claimed hundreds of lives, causing damage worth US$Bn's. Wildfires are breaking out in countries unaccustomed to the problem. Northern European countries experienced a 200x increase in area burned in 2018\. Even the UK is being badly affected (e.g. Winter Hill -- 2018).

We propose a new solution for early detection of the most predictable fires: those occurring due to power line failure - more damaging than most because they often occur in high winds. In California over 6 years, 1,500 wildfires started in the power line corridors of one utility company, some of the most devastating on record. In Spain, 3,185 fires were started by power lines between 1985-2010\. Power line operators worldwide now face severe financial liabilities (US$Bns), creating a large market (£M100's) for reliable and effective detection systems.

Utility companies have assessed sensors (based on visible/thermal imagers) but have not adopted any at scale because they are too expensive to rollout, require human monitoring and only detect fires once they have grown to an unstoppable size. Companies need technologies that can detect fires in the first minutes after ignition, while they still occupy <1 acre and when firefighters have a chance of extinguishing the fire before it causes extensive damage. This is challenging. Many wildfires occur in remote areas far from electricity and telecommunications infrastructure, so low power consumption, reliability and power/comms-autonomy are key.

The sensing system we propose will use low cost, world-leading pyroelectric infra-red (PIR) detectors (Pyreos) with low cost, highly-efficient non-imaging radiation-collectors (Tethir). PIR's are widely used in fire/flame detection systems for the oil-and-gas sector. Tethir's optics will give a usable detection range (1-2km) with existing detector performances and much further with the development of better detectors. The project will develop a saleable market-entry product and we predict sales of £M10's to power companies over the first 5 years after prototype demonstration, with further sales as we extend the detection capability to other wildfire causes (e.g. arson). The combination of cutting edge technologies with two world-leading UK experts in PIRs and wildfires at Imperial and Kings College London is key to the success of this development and brings the UK a significant wealth-creation opportunity while helping to solve a serious world-wide problem.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
A LA CARTE LIMITED	Intense Milk	£216,718	£97,523
COFFETEK LIMITED		£106,585	£37,305
COUNTY MILK PRODUCTS LIMITED		£139,720	£27,944

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The proliferation of premium Coffee Shops worldwide has created a consumer with sophisticated expectations for hot beverages. The dispense industry, challenged to match coffeeshop quality, are limited to practical but poor-quality shelf stable dairy replacement options. The company developing a sustainable solution to the problem of extending the shelf life of milk without compromising its flavour or protein functionality will position itself as an immediate market leader. The disruptive technology, Intense Milk, developed by A La Carté Limited places the company in a strong position to capitalise on the high-growth potential of the beverage and foodservice markets, both domestically and for exports. The project comes with the added benefits of protecting and creating UK jobs -- both in the dairy industry and the wider economy - and championing UK innovation. The product has welcome additional benefits, significantly contributing to a zero-waste economy by reducing the amount of milk wasted and the amount of packaging which would otherwise go into landfill. Intense Milk will be a major disruptor within the convenience beverage market and expand commercial opportunities for both the company itself and the UK supply chain it supports. The ALC specialised team have completed prototype development and initial testing and have applied for an Innovate UK SMART Grant to aid with experimental development costs. Next steps include pilot production, challenge tests to prove shelf stability, proof of performance in dispense equipment, consumer evaluation and validation at full production scale.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
TEN BIO LIMITED	Automating production of a unique skin culture test model	£301,282	£210,897

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

New skin products require extensive testing during development to determine safety, toxicity, and effectiveness, where required. Historically, this has necessitated the use of animal testing which has serious ethical and financial implications. The EU has been the global leader in the ban of testing of cosmetics and their ingredients in animals. In the chemical industry, tests on animals are only used when alternatives do not provide conclusive results. The pharmaceutical industry still relies on animal testing but is continually searching for alternatives to reduce the number of animals required and to generate more reliable pre-clinical data. Current skin testing alternatives have many limitations and do not correlate well with whole animal/human data which can slow the development of new products, increase development costs, or even generate misleading preclinical data. In fact, up to 500,000 animals are still used in Europe and the US annually for skin regulatory testing and research. In all these sectors, alternatives to animal testing and vastly improved human skin models are urgently sought.

Ten Bio, a spin-out from the University of Dundee, has created an innovative human skin testing technology, called TenSkin(tm), using skin that would normally be discarded following surgical procedures (e.g. abdominoplasty or "tummy tuck"). Skin on the body resides under natural mechanical tension. TenSkin(tm) consists of a method and device that holds this skin at this optimised tension, which maintains the skin in a viable state for up to twice as long as competing models making it suitable for a wide range of lab testing. Application of this technology will reduce, and in some cases eliminate, the need for testing of pharmaceutical, chemical, and cosmetic products in animals and/or inferior skin models.

This project is centred around the design and prototyping of a first-of-its-kind automated TenSkin(tm) assembly platform. This is essential to both meet the expected level of demand and enable a technology licensing revenue model for which we have already received interest from leading global companies. As a result of this project, pharmaceutical, chemical, and cosmetics companies across the world will have access to a novel human skin technology that provides data that is vastly more predictive of what happens on the body compared to existing systems. From wound healing to response to therapeutics, skin cultured using this tension-based technology behaves almost indistinguishably from living human skin on the body, offering users the most appropriate system for testing new dermal products.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Participant organisation names	Project title	Proposed project costs	Proposed project grant
EADON CONSULTING LIMITED	An innovative cost saving solution for 100 years of nuclear waste containment	£332,027	£232,419
ARC ENERGY RESOURCES LIMITED		£214,495	£150,146
University of Sheffield		£127,415	£127,415

Project description - provided by applicants

Vision: A containment solution for domestic and international nuclear waste management and decommissioning markets, specifically targeting unshielded legacy and new build waste streams. This represents a stable market opportunity, with a waste management strategy being developed for 100 years for the UK.

Nuclear energy provides reliable low carbon power for the UK as we move towards Net-Zero targets. However, we need to secure a cost effective, safe, and responsible means of waste collection and storage from operation, through to a power plant's end of life, and beyond.

Approach and Innovation: A 2017 Sellafield Game Changers collaboration between Eadon Consulting (Eadon) and Arc Energy Resources (Arc) conceived an innovative nuclear waste container unlike any in operation; a simple to manufacture cylinder with a unique and easy to operate closing mechanism that leverages design for manufacture principles for commercial innovation. This resulted in: formation of a joint venture, Capsa Solutions; patent protection; registered design; and concept launch at the Integrated Waste Management conference. Together with the Nuclear Advanced Manufacturing Research Centre (NAMRC), and subcontractors Hydrock and Radioactive Waste Management, Smart Grants investment will catalyse regulatory approval towards commercialisation.

Key objectives:

Alongside an advisory group representing key customers, Sellafield, EDF Energy and regulator, Radioactive Waste Management, by project end we will have:

* optimised container design,
* conducted manufacturing trials with production costing, and
* gained a conceptual letter of compliance towards commercialisation at TRL4\.

Impact: The Nuclear Decommissioning Authority estimates ~£120billion UK decommissioning costs over the next 100 years. The Inventory for Geological Disposal estimates 744,000m3 of UK packaged waste from 2015 to 2140\. Our container targets 47% of the total projected waste volume. We predict we can reduce the cost of manufacture, resulting in a saving of £99million through to 2120 (50% market share). A saving related to production cost only, we see further cost savings related to optimisation of the design to better fit the waste management lifecycle including increased storage efficiency, and logistical improvements related to waste container movement and transportation. The project will support two UK based SMEs to commercialise and profit from their design, contributing to the UK Industrial Strategy goal to increase the UK's competitiveness in product design and manufacture. This includes a significant global opportunity where decommissioning Europe's reactors alone generates another 1.4million m3 of low and intermediate level waste (World Nuclear Waste Report 2019, Focus Europe) that we can target through direct exports or licensing.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Participant organisation names	Project title	Proposed project costs	Proposed project grant
NATURE METRICS LTD	NatureMetrics: MOSAIC	£313,622	£219,535

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
NatureMetrics (NM) is an award-winning technology company using cutting-edge genetic techniques to monitor biodiversity. One of NatureMetrics' primary product segments is the detection of endangered species and invasive species from environmental samples. This can be for enabling planning permission, monitoring water or equipment used by utility and industrial clients or for conservation to name a few. Detecting and identifying organisms from tissue or environmental samples is conducted across a wide range of industries (construction/infrastructure/agriculture/fishing/health/legal sectors). Current competing technologies are limited in that they: require specialist laboratories, specialist personnel and expensive equipment (that are not portable and are impractical for field deployment); are most effective when applied to particular species, requiring multiple analyses to detect each one, becoming prohibitively expensive for clients; have a turnaround time of several weeks. By catalysing recent scientific advancements in DNA monitoring for conservation and biodiversity monitoring, NatureMetrics will develop and commercialise a product that allows rapid, cost-efficient, on-site detection of a suite of species that can be used by non-experts anywhere in the world and can be easily adapted to target other species that future clients may wish to detect. The project output is a platform, MOSAIC that aids in identifying endangered wildlife as well as invasive species, aiding to keep UK wildlife healthy and thriving.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ISIZE LIMITED	SEQUOIA: Sustainability-driven high quality video compression and delivery	£367,796	£257,457
BRITISH BROADCASTING CORPORATION		£310,964	£155,482
Queen Mary University of London		£289,887	£289,887

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The SEQUOIA project is a response to the emerging imperative needs for more financially and environmentally-sustainable high-quality video streaming. Project activities are aimed at addressing exploding market demands, and address the challenges faced by the media sector in tackling the **surge in online media consumption**, which is posing **unprecedented stress on Internet services**, while also greatly **contributing to the environmental footprint left behind by media services**.

Disruptive innovation for video streaming is urgently needed - new pre/post processing, encoding, and delivery tools that are device-aware and cross-codec compatible - to meet growing demands for online video reducing processing, energy and storage requirements. The SEQUOIA scientific innovation will result in a "**deep perceptual optimiser**" leveraging: (i) latest advances in psychovisual/perceptual models (ii) cutting-edge AI/deep-learning and (iii) state-of-the-art video coding, optimising quality, bitrate and environmental impact of video services.

Building on the partners' expertise on perceptual quality optimisation, video pre/post processing, video coding and deep learning, SEQUOIA will go beyond state-of-the-art to develop new AI-based video quality **analytics, streaming and encoding.** As a result, the SEQUOIA vision is to develop an automated **deep perceptual optimiser** to make an impact throughout all stages in the media distribution chain.

The project will demonstrate its results on operational and portable encoder designs, applicable both to Video on Demand (VOD) as well as live applications and encoding social media streams. The value of such scientific innovation will lead to benefits for the whole sector, demonstrating technology to enable sustainable distribution of Ultra High-Definition (UHD) content, while limiting the impact of video on internet traffic and reducing distribution costs. Extending beyond the commercial benefits, the project outcomes will be devised to support **environmentally conscious solutions by monitoring and proactively reducing energy consumption** at all stages within the media value chain.

Extending over a period of 24 months, the project brings together industrial (iSIZE and BBC) and academic (QMUL) partners. The partners bring unique expertise on **AI, video coding standardisation, adaptive video pre/post processing and streaming, perceptual optimisations and interoperable software architectures**, to collaboratively work towards these challenging objectives.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ELECTRONRX LIMITED	Novel wearable neurostimulation system to target period pain	£498,701	£224,415

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Problem

It is calculated that 80% of women of reproductive age (1.5bn people worldwide) suffer from period pain at some point in their life. The pain is felt as either intense spasms or dull and constant cramps in the abdomen which can spread to the back and thighs. Most women suffer the pain in silence, however it disrupts their daily and working lives and in extreme cases requires a hysterectomy.

Currently, there are no effective, long term, side-effect free treatments to deal with period pain. Most women use over the counter painkillers, often ibuprofen. However, this gives short lasting relief, is ineffective for people with severe pain and can have several side effects if used long term. Other treatments are hormonal contraceptives, surgery or self-help measures, however these have either major side effects, including an increased risk of blood clots and heart attacks, or give limited pain relief.

The Ohmm Solution

This project was born with the intention of giving women around the world control back during their periods. We are developing a novel neurostimulation device, based on extensive scientific evidence that targets the cause of period pain, providing long lasting drug-free pain relief.

The device will be worn on top of the painful area, either the abdomen or lower back, and provide pain relief by an anti-inflammatory mechanism. It has been designed in collaboration with period pain sufferers to be small, comfortable, lightweight, discreet and can even be worn while exercising or doing other activities.

It is wirelessly controlled by a paired smartphone app, and activated only when it is needed. Ohmm's treatment can be personalised, allowing the user to select the most effective, comfortable, pain relieving settings.

Ohmm gives women the chance to treat their pain whenever they need it in a discreet, customizable way, leaving them free to carry out their daily routines and contribute to society and the economy without fear of period pain.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
PLESSEY SEMICONDUCTORS LIMITED	The MICROLIGHT: Full Colour Micro LED Light Engine Project	£349,998	£209,999
University of Glasgow		£149,999	£149,999

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Augmented reality (AR) projection will supplant the smartphone by allowing the display of information: texts, emails, and directions directly in front of your eyes - the so called "Kingsman" style glasses. AR market expectation is $1.8 billion by 2025\. Combining their expertise, the partners will create the world's first wafer level monolithic, red, green and blue AR display engine. This will use a unique colour converting material integrated onto a world leading wafer scale GaN microLED display technology. The challenge for a viable AR product is to make a lightweight unit, ideally less than 50g, that has an attractive or even stylish appearance. The light source needs minimal power consumption and to be bright enough to compete with daylight.

Light emitting diodes (LEDs) are ideally suited to this challenge being both brighter and more energy efficient than current display technologies (OLED, LCD, LCoS, DMD). MicroLEDs have been used in high resolution displays with individually controlled pixels below 1µm. However, these are single colour displays, red (630nm) using AlInGaP materials, and blue (450nm) and green (540nm) from InGaN. Three displays have been used with an X-prism combiner to generate a full colour image in some applications. The size, weight and power consumption of such a system is incompatible with the desired AR product.

The smallest footprint needs red, green and blue (RGB) emitters to be formed side by side on a single substrate, a truly monolithic approach. Because AlInGaP and GaN have different crystalline structures it is impractical to grow these materials on the same substrate. It isn't yet possible to pick and place microLEDs from separate RGB substrates onto a single addressable backplane. The mechanical accuracy and yield needed for high resolution displays are too great.

Down-converting materials, which absorb short blue wavelength and emit longer green and red wavelengths, will realise a monolithic RGB display. Typically, this involves separate red and green converting material placed over blue emitting pixels. The material is patterned to form the RGB pixel construct. However, there is no down-converting material to date which can be implemented for an AR system. For example, inorganic phosphor particles are too large for the display pixels and quantum dot films quickly degrade at the high light flux density used in daylight viewing.

This project will integrate the colour converter with the microLED display and fulfil this need.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CLOUDIQ LIMITED	Compositional learning research including a novel meta-model for eCommerce	£347,375	£208,425

Project description - provided by applicants
The main theme of our project is to improve business and industry efficiency. Our project relates to research into the next generation of AI to help retailers. Geoffrey Hinton, the godfather of deep learning in AI wrote 'Very advanced intelligence is going to involve making communities of intelligent systems because a community can see much more data than an individual system'. The most successful online retailers, like Amazon, Boohoo and Asos all use AI to power growth that is 30% faster than the average but AI is still hard to access and deploy for the vast majority of online retailers. Cloud.IQ want to help all online retailers access cutting edge AI building on our existing conversion rate optimisation solutions, which is currently used by 400 live merchants worldwide. Our innovation is in the field of Collective Artificial Intelligence, focused on enabling stand alone, separate deep learning models, to work together towards a single shared objective. Cloud.IQ already has the data set, AI engineers and a unique plan to deliver and AI solution for E-commerce which will work out of the box for any online retailer. We have validated our proposal with notable AI practitioners and academics, who confirm that this concept is the next evolution in AI. This technology will serve retailers in many ways, at its core it optimises revenue or profit, but beyond this it will help them to more effectively manage their stock with the use of predictive sell-through analytics.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SYNALOGIK INNOVATIVE SOLUTIONS LIMITED	Synalogik: Detecting and challenging Local Government Authority (LGA) Fraud committed by Organised Criminal Groups (OCG) through Investigation Process Automation	£433,292	£303,304
University of the West of England		£52,377	£52,377

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Formed in 2018, SYNALOGiK Innovative Solutions Limited is a UK based technology company, founded by experts in data science, intelligence, security and investigation. Alpha-test version of their cloud-based software, SCOUT, has been developed and successfully deployed within insurance and police organisations. The platform is ISO27001 certified and has passed ICO commercial due diligence. Fraud costs the public sector at least £20.6bn annually, with an increasing and emerging trend of complex OCG (Organised Crime Group) activity. The impact of fraud is beyond financial, often creating traumatic experiences for victims and devastating social impacts, reducing confidence in public sector financial care. In collaboration with the University of West England and eco-system partners, Synalogik will leverage joint cooperation between government departments to identify essential data feeds, building a shared information model, creating a unique and UK-first OCG Single Intelligence Environment (SIE) tool to detect fraud nationally. The solution will provide quantifiable time, cost, and quality improvements for government analysts in identifying, detecting and evidencing fraud. Disruption of LGA fraud and an increase in the number of offenders prosecuted will mean that public resources can be used more effectively to provide key services to the most vulnerable in UK society and a more secure space for the general public.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CELLEXUS INTERNATIONAL LTD	Novel Airlift Single-use Bioreactor System for 1-100 Litre Pluripotent Stem Cell Production	£459,770	£321,839

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Cellexus was founded by Gavin Hands, Yann Lecouturier and Brian Wales. Cellexus is developing a novel airlift single-use bioreactor (SUB) dedicated to stem-cell production at a scale of 1--100 litres. It is expected to generate a year-5 post-project revenue of £26M. This system would have the potential to positively impact regenerative medicine, drug screen processes, biomedical research and other commercial and scientific projects (Rodrigues et al., 2011).

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BIG ATOM LIMITED	TRICE – Tyre Rubber Into Circular Economy	£493,780	£345,646

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The disposal of waste tyres is a significant environmental issue particularly as their disposal in landfill was banned in 2003 in the UK and Europe. Most tyres are "mechanically" recovered i.e. they're shredded, and the recovered rubber shreds and crumbs used in road and other rubberised surfaces and the recovered steel and textile reinforcements either re-melted or valorised, respectively. In the UK about a quarter of the 550,000 tonnes of arising waste tyres are exported as shreds -- much of it ending up in India, where they batch pyrolyse the shreds to produce tyre recovered oil, a heavily polluting sulphur containing fuel. In 2019, the Indian authorities began restricting tyre waste imports to the extent that this permanent change is expected by UK's Tyre Recovery Association, Environment Agency and Defra to place significant strain on UK recycler's ability to meet demand for recycling services. The UK desperately needs new capacity (in the form of pyrolysis operations and other technology) to avert heightening levels of fly tipping and make this waste stream more sustainable.

BIG ATOM has developed the concept of a novel pyrolysis reactor with improved temperature control with the vision of a circular economy for waste tyres. We now propose to construct, test, and prove the concept of a quarter-scale reactor that is big enough to demonstrate the issues associated with scale-up. If the project is successful it will form the basis of a full-scale reactor for the commercial production of recovered Carbon Black (rCB) and Tyre Recovered Oil (TRO) of an improved quality that can be used as part of the circular economy to create new truly recycled materials.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Participant organisation names	Project title	Proposed project costs	Proposed project grant
VAMSTAR LIMITED	Data Science powered healthcare supply chain network monitoring system in the post-COVID and post-Brexit industrial landscape	£315,668	£220,968
University of Nottingham		£54,542	£54,542
University of Sheffield		£79,678	£79,678

Project description - provided by applicants

Last year, 44% of healthcare contracts within the EU received just one applicant and 15% had no bidders at all, costing the UK taxpayer billions in wasted critical-healthcare-resources through having to repost the contracts, and through receiving not best value-for-money goods/services due to the lack of applicants, especially low participation rates of SMEs, and poor matching of offers from suppliers. Supplier selection, management, and overall procurement process in the health sector is a dated/complex manual-process, meaning buyers and suppliers invest a significant amount of time/manpower, yet due to the high barriers of entry, miss many opportunities or have poor visibility across the supply base.

Moreover, in times of crisis like the COVID-19 pandemic, where there is a sudden surge in global demand of critical supplies, the apparent flaws and inefficiencies of the current healthcare-marketplace are accentuated and expose the buyers to significant supply-risks -as reported by the National Audit Office- while endangering patient lives. Furthermore global supply chains in public procurement are affected by the legal and policy environment that they inhabit. For example, the reform of the UK public procurement regulatory framework post-Brexit and the planned reform of the Modern Slavery Act framework will affect the public procurement ecosystem. In turn the establishment of a dynamic, up-to-date mapping of global supply chains and of the networks that are constantly created therein can inform policy making, by identifying the most suitable policy permutations and thus optimise policy outcomes.

There is a critical need for an e-marketplace in healthcare that focuses on: (1) improving visibility of supply/demand data that are currently heterogeneous or inaccessible; (2) giving access to all suppliers and buyers, allowing capturing of the long tail of SMEs in the procurement mix; (3) allowing effective and efficient supply-chain-management (SCM) to enable connected performance tracking and measurement of the procurement relationships; and (4) allowing a lens to gauge the market in order to inform policy making for the new industrial landscape (post-COVID, post-Brexit).Vamstar offers a data science powered approach towards an e-marketplace in healthcare. With a multi-sided platform technology we aim to reduce and eliminate marketplace inefficiencies for the buyers (NHS, hospitals, clinics etc.) and the sellers (pharmaceuticals, medical device manufacturers etc.). Vamstar will collaborate with the University of Sheffield (UoS) and University of Nottingham (UoN) in order to develop the first healthcare public contract prediction and matching platform.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Off World Live Limited	Open-source, multi-functional pipeline for 360 interactive virtual live-streaming	£400,934	£280,654

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Industrial research into new pipelines for 360 degree, virtual, interactive live-streaming

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
AGM TECHNOLOGIES LIMITED	Development of Ultra Low-Power Inertial Sensing Technology for Battery Powered IoT Device (Project-IC7AD)	£299,935	£209,954

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Telematic devices (TD) supporting user-based insurance (UBI) are focused on driver behaviour monitoring (acceleration, speed, braking and road miles travelled) promoting safer driving to reduce risk, targeting high premium young drivers. However, insurance fraud (non-reporting, crash-for-cash and personal injury) claims processing and establishing liability remain major costs.

Current UBI TDs include mechanic installed black boxes, self-installed battery devices like AGMT's IC6 and similar plug and play devices utilising in-car charging. All monitor driver behaviour with crash detection capability but all lack the data granularity for accurate event characterisation that is needed to eliminate fraud, liability resolution and service delivery efficiencies.

AGMT have developed a next-gen battery powered telematic device for self-installation (IC7) with very high data granularity. However, power requirements for digital event monitoring, detection, processing, as well as storage and communication limit IC7's ability to address the industry challenges.

Project-IC7AD therefore aims to implement innovations to reduce the power requirements needed by the device in normal operation, increasing the power available for data processing, communication and analysis. The aim is to deliver the highest quality telematic event data service for UBI insurers using AGMT's self-installed battery powered TD.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
APNEA-TECH LIMITED	Low-cost sleep apnoea screening device	£81,874	£57,312

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Innovate UK has awarded a grant to Apnea-Tech Limited to complete a feasibility study on a radical, low cost scanning device to be used by clinicians and healthcare professionals to scan people for Obstructive Sleep Apnea (OSA).

OSA is a chronic respiratory condition characterised by frequent episodes of upper airway collapse during sleep, inhibiting normal respiration. This results in poor sleep quality and daytime drowsiness. About 90% of people who experience apnoeic events have OSA. OSA is linked to diabetes, hypertension and other cardiovascular diseases.

Research estimates that 936 million people globally suffer from OSA. Even in developed markets, over 70% remain undiagnosed and therefore untreated. In the UK it is estimated that 1.5 million people have OSA but currently only 330,000 are diagnosed and treated. OSA can be treated effectively, with 85% of patients using CPAP devices.

Apnea-Tech has identified a clear and unmet need internationally for a low-cost diagnostic aid that assists clinicians to identify people with sleep apnoea. Research shows that increasing the diagnosis of sleep apnoea will decrease healthcare costs, improve the patients' quality of life and reduce societal costs (fewer work related injuries).

Current diagnostic aides are only available through specialist clinics, are expensive to purchase, use relatively expensive consumables and are used by multiple patients, requiring increased cleaning protocols for infection control. Apnea-Tech's transformational ApneScan concept has three advantages over current OSA diagnostic technology:

* Low cost
* Simplicity of use
* Disposable single-user device

The company is forecasting a significant market opportunity for its technology, benefiting patients and clinicians. A research report from Office of Health Economics Consulting and the British Lung Foundation concluded that increasing diagnosis and treatment of OSA to cover all patients with moderate-to-severe OSA will reduce NHS costs by £28m per year and prevent up to 40,000 fatigue-related accidents in the UK, saving costs of £930m.

The primary objective of the Innovate UK funded development project is to assess the feasibility of a low-cost obstructive sleep apnoea scanning device. There are four main deliverables:

1. Several proof-of-concept demonstrator devices
2. Initial usage assessment
3. Commercialisation plan
4. Patent application

Apnea-Tech Limited is a newly-formed start-up MedTech SME which is led by two highly-skilled and experienced individuals recognised as experts in medical device development, sensor development and evaluation, respiratory monitoring, advanced analysis techniques, data management, business development and commercialisation, and project management.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SHELLWORKS GROUP LTD	Scaling up the production of bio-based and biodegradable packaging for the cosmetics industry	£357,503	£250,252

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Annual global plastic production reached 438 million metric tonnes in 2017 (Geyer_2020). Each year, it is estimated that at least 8 million metric tonnes of plastic waste reaches our oceans, where it degrades slowly over hundreds of years to produce harmful microplastics (Jambeck_et_al_2015). The global damage to marine ecosystem services from marine plastic is estimated to be equivalent to a loss to society of at least £0.4-1.9 trillion/year (Beaumont_et_al_2019), without taking into account potential negative impacts on human health, which are still poorly understood.

A recent study found that UK and US citizens produce the most plastic waste per person, at 99 and 105 kg/person/year, respectively (Law_et_al_2020). This is equivalent in weight to each UK citizen using 10,000 plastic bottles per person per year, or nearly 200 plastic bottles per week.

The recent explosive rise in awareness of the global plastic crisis, triggered by the publication of The New Plastics Economy by the Ellen MacArthur Foundation in 2016 - which found that under a business-as-usual scenario there would be more waste plastic by weight than fish in the sea by 2050 - as well as the release of Blue Planet II in 2017 - has led to a global search for bio-based and biodegradable materials to replace fossil fuel-derived non-biodegradable plastics.

In response, The Shellworks was founded in July 2019 by three Imperial College/Royal College of Art graduates. Our ambition is to disrupt the global plastics market with our bio-based, biodegradable, and compostable packaging material produced from waste agricultural biomass, a renewable and plentiful feedstock. Our innovative material is truly biodegradable and home-compostable, breaking down into marine-safe components at the end of life if it reaches the oceans.

We have already successfully completed small-scale product trials with key target customers in the cosmetics industry, which have validated performance, and are ready to scale up our technology. Here, with support from Innovate UK and working with key target customers, we will scale up our production process from laboratory- to pilot-scale. Our proprietary material formulations are designed for performance in use, biodegradability even in the natural environment, and manufacturability at scale, using existing manufacturing facilities.

This project supports the UK's ambition to become a world leader in sustainable packaging, tackling the global plastic waste and climate crises, in close alignment with the Industrial Strategy Challenge Fund Smart Sustainable Plastic Packaging and delivering the targets of the UK Plastic Pact.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BUCKINGHAM HEALTHCARE LIMITED	The Glider	£337,128	£235,990
Bournemouth University		£43,325	£43,325

Project description - provided by applicants
Established in 2001, UK-based SME Buckingham Healthcare (Buckingham) has a team with significant clinical expertise and a strong track record in researching, developing and commercialising patented innovative living assistance aids. Buckingham will accelerate product development of a game-changing transfer assistance aid to improve user's access to toileting facilities: **The Glider**, improving independence, mobility and dignity for elderly, disabled and bariatric users.
This project will be supported by Bournemouth University's Orthopaedic Research Institute (ORI). ORI works with academia, industry and healthcare, producing high quality orthopaedic research and educational outputs across devices, technologies, treatments, surgery and related diseases. Their research and dissemination provides a proven positive impact across patients, clinicians and society.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SIBELIUS LTD	A method for system-wide identification of target proteins and their ligands from complex extracts of natural products	£205,343	£143,740
University of Buckingham		£65,649	£65,649

Project description - provided by applicants

Ageing populations, increasing rates of lifestyle-related conditions and costs of drug development/healthcare provision represents a global societal challenge. 'Self-care' - "the ability of individuals, families and communities to promote health, prevent disease, maintain health, and to cope with illness and disability with or without the support of a healthcare provider" (WHO) - will contribute towards meeting this challenge. Natural products - compounds produced by living organisms - account for close to 20% of the Nutraceuticals industry, and there is a rising consumer inclination towards them.

Wide structural diversity and evolutionary pressures mean natural products have strong potential to interact with proteins and impart effects on human health; evidenced by 25% of New Chemical Entities approved between 2010-2014 being natural products or derivatives (Newman and Cragg 2016). Alongside individual "active" compounds (e.g. curcumin from Turmeric root), many natural products are complex extracts containing 100s-1000s of compounds; sometimes further complicated in preparations of several species (Ayurvedic and Traditional Chinese Medicines). This complexity may be important for health benefits through synergistic interactions between compounds e.g. "entourage effect" noted for Cannabis (Ben-Shabat _et. al.,_ 1998). However, this complexity and inherent variability of natural products (genetic, environmental, cultivation, processing, extraction factors) makes substantiation of claimed health benefits difficult and leaves consumers ill-informed and under-served.

There is a recognised need to provide well-specified natural products with standardised biochemical properties and demonstrated efficacy in humans. Current methods can provide insight into health-relevant Mechanism of Action for natural products, based on biomarker response signatures or the identification of protein targets. Similarly, bioassay guided fractionation or affinity purification methods (using protein targets as bait) can support identification of active compounds within complex natural products. However, no current method can identify Mechanism of Action and active compounds concurrently and typically rely on prior knowledge of one or other factor.

To address the challenge, the partners aim to combine the principles from existing chemoproteomic approaches to develop a novel method to identify active compounds for natural products and their target proteins in human cells in parallel on a system-wide level. This capability will enable decoding of natural products and their activities, and support development of better-specified products for the nutraceuticals market, with a comparatively high level of scientific understanding at competitive cost to better serve customer, brands and regulators needs.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FRACTAL LABS LTD	Distributed ledgers Enabling Application for sme Loans (DEAL)	£458,782	£321,147

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Vision

UK SMEs face a £29.3bn finance gap. Lenders struggle to assess SME finance applications due to complex, inter-linked issues. Issues include poor access to SME financial data, bespoke and manual SME Contracts and SME debt securitisation. Whilst lenders are investing in technology to assist financing for large organisations, they cannot for SMEs as SMEs are only average 2% of lenders' revenue, individual SME financing requests are too small and SME finance application assessment too complex.

Market

There is a £22.0bn global opportunity to provide SME finance assessment and securitisation to lenders.

Key Objectives

DEAL, an ambitious Industrial Research project by UK-based SME Fractal, will develop radical innovations and realistic exploitation plans addressing UK and global market demands for accurate, quick and cost-effective SME finance application assessment and securitisation.

Focus & Innovation

DEAL focuses on Industrial Research to prove the concept of innovative technology to address market issues.

Risk

DEAL's innovation and ambition makes the project technically and commercially risky. Risks have been minimised, with robust risk management and mitigation plans developed.

Team

Fractal has the necessary skills/experience to manage and complete this project successfully.

Value

DEAL has been carefully planned by Fractal's experienced technical and commercial team to maximise innovation, chance of project success. DEAL delivers UK-wide value-for-money and impact.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
LOCAL E REWARDS LTD	Critical Investigation of an AI Driven Loyalty Network System to Efficiently Increase Footfall at Small High Street Businesses.	£99,545	£69,184

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
A significant proportion of high-street businesses have lost revenue due to the decreased footfall and, in turn, sales due to the increased trend in online shopping, an issue exacerbated by the COVID-19 pandemic. This situation has placed small businesses who lack the resources to move towards an online model and cannot compete against larger incumbents, at an increased risk of failure. Local-E, aims to provide a sustainable and efficient solution in the form of a new network loyalty platform (Local ePay) which utilises machine learning to increase footfall and sales as well as minimize merchant costs.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SOURCERY.AI LIMITED Imperial College London	Sourcery: AI-powered code refactoring	£165,045 £68,590	£115,532 £68,590

Project description - provided by applicants
Today's global economy is increasingly underpinned and powered by software. When this software contains badly written code, it hampers the productivity of businesses, public services and individuals. Poor quality code is difficult to maintain, update and extend, and is more prone to bugs. Software issues are estimated to have cost private and public organisations $2.8 trillion in 2018\. We have developed Sourcery, a tool that improves the quality of code automatically. This product has the potential to radically increase developer productivity by automating the lengthy manual process of improving code. It can currently perform some tasks that take developers more than an hour in under 2 seconds. This project is a partnership with Imperial College London intended to develop the technology required to turn Sourcery into a truly essential tool for developers. It will apply state-of-the-art machine learning to automating code quality improvement, which is a truly novel idea.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FLEXCITON LIMITED	Auto-generation of optimisation models for scheduling semiconductor factories	£486,665	£340,666

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Flexciton Limited has created and patented a completely novel means of semiconductor manufacturing scheduling optimisation. It has been demonstrated that our solution can bring significant reductions in manufacturing cycle times over the current state-of-the-art. However, the major barrier to the market has been that our solution is bespoke for a single semiconductor factory and requires many months of consultancy work to tailor the solution for a specific factory. This 9-month project will overcome this issue by constructing a generalised 'one-size-fits-all' optimisation solution for all semiconductor factories. This innovation will be one of its kind and will initially be applied to UK semiconductor manufacturing and then exported overseas. Post project completion, Flexciton expects to generate profits which will be invested in R&D to further generalise the technology to be applicable to every sector of UK manufacturing. This project's vision is to enable UK manufacturing to retain its global dominance in the global manufacturing sector and fuel UK economy growth.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Participant organisation names	Project title	Proposed project costs	Proposed project grant
KUGEL ROTARY SERVICES LTD	UltraMQL-Ultrasonic Minimum Quantity Lubrication Machining for Economic & Environmental Sustainability	£477,294	£334,106
BLOC DIGITAL LTD		£361,017	£252,712
QAUKER HOUGHTON		£118,110	£59,055
University of Brighton		£197,692	£197,692
University of Sheffield		£198,826	£198,826

Project description - provided by applicants

The upcoming green revolution will impact machining at the heart of the UKs precision manufacturing industry: supplying sectors including energy, automotive, and aerospace. The peculiarity of the UK's manufacturing industry is it that it is formed by a large number of long standing small and medium enterprises (SMEs). Legacy equipment, on which UK machining SMEs rely uses costly, environmentally damaging, and machine degrading flood coolant, or dry machining which lacks the cooling and material removal properties of the former. The UK is at risk of losing its competitive edge in manufacturing capability, alongside the extensive supply chain that underpins it.

Kugel Rotary (machining), Quaker Houghton (lubricants), the University of Sheffield's Nuclear Advanced Manufacturing Research Centre, the University of Brighton's Advanced Engineering Centre, and Bloc Digital (Industry 4.0) will develop a cost-effective Ultrasonic Minimum Quantity Lubrication (UltraMQL) machining system to retrofit to existing equipment. This will enable SMEs to take advantage of previously unaffordable technologies, and upgrade them for incoming regulations under the green revolution and Net Zero targets.

Minimum Quantity Lubrication (MQL) can significantly reduce a company's energy footprint and running costs, as well as reduce the amount of coolant use by up to 99%. However, achieving a reliable delivery of oil in MQL systems is challenging: oil viscosity varies significantly depending on the supplier, the local temperature, and ageing of the oil. Current state-of-the-art MQL systems use a Venturi tube to aerosolize the lubricant. This approach is simple and robust as it is fully passive, but it is strongly dependent on oil's viscosity changes and has an erratic flow rate, which can lead to poor surface finish or excessive contamination of the machined material. A true multi-oil, cost-effective, high-precision flow rate unit is not currently on the market.

The UltraMQL team have the necessary experience and skills to develop a hybrid stream-generator/ultrasonic-transducer aerosoliser that would respond and adapt to viscosity changes, and provide real-time monitoring of the lubrication process. We will also develop and integrate a remote monitoring solution, using acoustic and video monitoring, to provide workshops with a fully integrated retrofit approach to sustainable high-tech manufacturing. By project end the team will have produced a validated prototype of the complete integrated system and lean concept designs to clearly demonstrate value to the customer.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
LIG NANOWISE LIMITED	Super-resolution, low cost optical bio-nanoscope for direct virus imaging	£499,133	£349,393

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Coronaviruses are threatening the lives of human being worldwide. Understanding of coronaviruse interactions with cells and drugs is essential for the development of treatments and prevention of future pandemics. LIG Nanowise Ltd will develop a new super-resolution, low cost optical microscope at 50 nm direct optical resolution that can see live viruses including coronavirus (60-140 nm in size) and their interactions with cells and drugs to accelerate drug discovery and diagnosis of diseases. Current electron microscopes and other optical microscopes cannot visualise live viruses due to the requirement for vacuum operation or the injection of fluorescent materials into the viruses or low optical resolution (a theoretical resolution limit of 200 nm for standard optical microscopes).

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
INDUCTIVE POWER PROJECTION LTD	RF magnetic induction pest controller for cabbage stem flea beetle control - commercial prototype	£350,324	£245,227
Harper Adams University		£29,725	£29,725
Imperial College London		£116,533	£116,533

Project description - provided by applicants

There is an acute need for an affordable, long-term solution to the escalating problems of invertebrate pest control in horticulture and agriculture, and magnetic induction heating can provide a resolution. Although invertebrates are small-sized poor electrical conductors, they are hundreds of times more electrically conductive than plants, and so induction heating rates are proportionately higher.

RF magnetic induction heating for pest control (MIHPC) is an innovative game-changer uniquely offering a sustainable, cost-effective and precisely-targeted one-stop treatment to replace a broad spectrum of insecticides and molluscicides. MIHPC can kill insects inside plants without using chemicals. Pests can be rapidly killed, yet plants remain unaffected. With no toxins, the big gains will be its target specificity; MIHPC is safe outside its narrowly-focused treatment-zone; MIHPC is appropriate for unmanned vehicles, can be used in any weather condition, and pests will not build up resistance.

Our team has proven the concept of MIHPC at full-scale, even though the frequencies and mobility required for this application extends well beyond what is currently considered normal for traditional induction heaters, developing our own pioneering megahertz-frequency induction heating technology.

This 18-month lab-based study will test the feasibility of packaging the power electronics and build a RF magnetic field generator for a commercial demonstrator to target cabbage stem flea beetle (CSFB) in winter oilseed rape (OSR). The suspension of the use of neonicotinoid seed treatments for OSR has created a problem in treating CSFB. Subsequently, farmers have struggled to profitably produce OSR because the cost of the loss by CSFB, and the area planted in the UK has been halved. CSFB in OSR has therefore been identified as an internationally significant target market for our technology. MIHPC units could be fitted to a robot and worked 24 hrs/day in all weathers and at any time of the year. In order to knock the CSFB population down, MIHPC makes possible the option to treat the larval stage, which tunnel into the stems and then cause extensive damage. An infested plant may contain over 30 larvae, and they are sitting targets. The project is formed from a partnership between one micro-SME and two academics. It will be pushing hard at the boundaries of magnetics technology and generate valuable world-wide intellectual property.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
MAXION THERAPEUTICS LIMITED	An Innovative Molecular Fusion Format That Targets Ion Channel-Driven Diseases	£499,925	£349,948

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Maxion is a newly founded UK therapeutic development SME solving a significant unmet global need with its novel, disruptive platform that can generate antibody-like therapeutics to target ion channel-driven diseases. Taking inspiration from nature, Maxion's founders have combined ion channel modulating mini-proteins found in venom and other sources called knottins into the antibody surface to create mixtures named KnotBodies. KnotBodies combine the best of both components by preserving the ion channel modulating function of knottins while enjoying the optimum drug like properties of antibodies. Maxion's unique drug format will treat diseases such as chronic pain, autoimmune disorders and heart disease. This innovative product reduces initial drug discovery timelines by at least two years and increases the chance of generating a functional ion channel modulator by 10-fold.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FUELL LIMITED	Fuell: Artificial Intelligence and camera-based driver drowsiness detection and warning system	£272,684	£190,879

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Fuell -- Artificial Intelligence and camera-based driver drowsiness detection and warning system

Driver fatigue is a global killer, costing billions in lost time, efficiency, insurance costs and lives.

Fuell's objective is to develop a fatigue management system based on physiological detection using an in vehicle camera or a driver's smartphone camera that detects the onset of drowsiness and warns drivers to take action.

This project will build on an existing Fuell algorithm-based system that uses Heart Rate Variability (HRV) derived from the Photoplethysmography (PPG) sensor on a Garmin smartwatch to continuously measure fatigue and warn the driver up to 20 minutes in advance of a likely sleep event.

This project will use a camera, such as a standard driver-facing in-cab camera or a smart phone camera, to detect vital signs, matching the accuracy of the current wearable-based Fuell system. Critically, this will make it more readily commercial by reducing the cost per driver of the system.

In this project, we will take existing rPPG knowledge and adapt Fuell algorithms to create a system that will deliver the detection of drowsiness at a commercially exploitable cost.

The Fuell fatigue management system will ultimately apply to any sector where operator fatigue can have an impact on safety, efficiency and health, not just drivers.

Worker fatigue is a global problem and the Fuell fatigue management system will be applicable world-wide.

Results of Competition: Innovate UK Smart Grants: August 2020

Competition Code: 2004_SMART_APRIL

Total available funding is £25,000,000

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
DATUM ELECTRONICS LTD	Intelligent marine engines health assessment system based on digital twins and data driven models (i-HEATS)	£389,031	£272,322
P&O Ferries holdings Ltd		£29,828	£14,914
University of Strathclyde		£172,673	£172,673

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The i-HEATS project aims to develop an intelligent engine condition monitoring and diagnostics system based on first-principles digital twins and data-driven models. The project has direct application to ship and land power plants, endeavouring to provide a game-change in the condition monitoring of internal combustion engines. I4.0 technologies will be employed leading to the development of intelligent tools, including digital twins, deep learning, sensors fusion, and cloud computing. The novel areas of the project include the use of a unique, custom made, data acquisition system for measuring the instantaneous shaft torque, storage and analysis of acquired data locally and on cloud (edge/cloud computing), a first-principle based engine digital twin integrating thermodynamic and crankshaft/shafting system dynamics models, data-driven models based on deep learning techniques complementing the digital twins to offer real-time predictive capabilities, developed data-driven model to identify and rectify inaccuracies of critical sensors of the measured parameters (sensor fusion), data-driven algorithms to monitor engine condition and provide diagnostics based on the measured instantaneous torque and other critical parameters. The prototype i-HEATS system will be developed and tested by integrating the above tools with appropriate hardware and user interfaces and subsequently will be extensively tested in lab and full-scale conditions leading to a pre-commercial version. The developed system will be capable of monitoring engine condition and providing timely diagnostics based on indicators relevant to performance, maintenance, emissions, and operating costs. The i-HEATS system will be implemented for the two typical engine types used for ship power plants. This project provides a sophisticated and innovative engine condition monitoring and diagnostics system with tangible benefits on fuel efficiency, environmental footprint reduction, engine reliability improvement, and the reduction of the operating fuel and the maintenance costs. The i-HEATS project advances and innovation will pave the way towards the development of future smart ship systems.