Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

Total available funding is £25 million across Stream 1 and 2.

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
POWERALL LIMITED	PowerAll 2020 Vision	£438,351	£197,258

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
PowerAll Ltd was formed in 1979 when it began as a specialist manufacturer of electronic control solutions for a wide range of applications, covering for example, mobile canteens, mobile repairs and emergency vehicles, developing over the years into a modern, innovative business achieving circa £1m sales p.a. The need for alternative sources of power in vehicles resulted in PowerAll successfully developing innovative solution, such as the 'Swap-Out' Alternator that is capable of providing multiple electrical power outputs, dependent upon customer requirements. The development project being considered is to design and develop to prototype stage an entirely new generic, core control system on which all future product developments can be based. Through the integration of sophisticated electronics design and interfacing, multiple voltage outputs can be generated, suitable for a wide range of equipment such as welders, coffee machines, winches etc. Such a development will be highly innovative and when completed will have global market potential, significantly impacting on PowerAll's performance with the consequential benefits to the national economy. In order to capitalise on this opportunity we need to design, develop and test a series of prototypes. We need to secure robust international IP protection. We need to identify suitable suppliers of reliable components. We need to establish effective manufacturing protocols and quality control, including incorporation into our ISO9001-2008 quality processes. We also need to invest in international branding, marketing, and technical support materials. This will involve several people within the business as well as external resources. A successful development will maintain and enhance PowerAll's strong competitive position and ensure the ongoing viability of the business, thereby not only protecting the current, highly skilled staff but creating further employment opportunities in an area suffering from higher than the national average unemployment, particularly amongst the under 25's.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ASTRAL PS LTD	Smart Adaptation tools for Buildings (Adapt-ABLE): A System for Streamlining Housing Adaptation Process for Aged and Disabled	£218,347	£152,843
FORTIS LIVING LIMITED		£0	£0
Heriot-Watt University		£15,000	£15,000
IIZUKA SOFTWARE TECHNOLOGIES LIMITED		£131,175	£91,822
Leeds Beckett University		£134,753	£134,753
London Borough of Southwark		£0	£0

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

Significant proportion of the UK's ageing&disabled population desire to stay-put in their own-house, thereby enhancing community-engagement, self-esteem, privacy and high-level of activity(Zhou,Oyegoke&Sun, 2018). To enable this, and associated cost-benefits compared to living-in-care, the government have the statutory responsibility to provide financial-assistance for housing-adaptation. However, the process is currently cumbersome-(and delay-prone), including referral, allocation, assessment, funding&installation, all of which involve various-stakeholders with less streamlined-process. The time to complete the process ranges significantly with some taking up-to-1460 days(Jones,2017), implying that some of the applicants would have died or temporarily-moved into care.

Whilst there has been some improvement in the last decade, there is currently no integrated&interactive platform for facilitating speedy/self-assessment&adaptation. The proposed study adopts techniques in Machine-Learning(ML), advanced-optimisation, Decision-Support-System(DSS)&cloud-computing to create an innovative tool (Adapt-ABLE) that streamlines the whole-process from self/home-assessment through installation to performance-management. It consists of five-elements:

1\. **Home Assessment/Analytics platform**

The platform allows users to evaluate easiness of living in their home for aged and people living with various forms of disability. The platform will provide age and disability-friendliness matrix, and suggest the changes required to support people as they age.

2\. Adapt-ABLE Platform for Indicative Assessment

An accessible online-platform that allows self or third-party referral. It is a one-stop shop with an indicative self-assessment of need-requirements that consider/determine eligibility-threshold, level of adaptation, case risk-band, automated means-test, with an instant display of indicative-assessment results. The system will also link unqualified-applicant to where further helps could be sought.

3\. Adapt-ABLE procurement and Tendering Hermeneutics

This platform automates needs requirement to specification from the database. It enables applicants or their representatives to upload supporting documents, select pictorial description and contribute to contractors' selection. It facilitates e-tendering by contractor, whose information will be held/updated on the platform. The platform will standardise price-scheduling, procurement and payment issues will be standardised.

4\. Machine Learning-enabled Predictive Maintenance/Repair

For effective management and proactive adaptation of housing stocks, this platform enables housing providers to predict adaptation needs of their housing stocks using machine learning algorithm. In addition, the system prevents the occurrence of failure by performing maintenance monitoring and notification.

5\. Smart Performance-Management and Analytics Platform

Interactive platform during installation stage - site supervision and liaison. It includes monitoring and tracking system, multi-mode feedback platform, platform dealing with complaints and portal for knowledge-base integration for monitoring of each process and overall adaptation over time. It will also enable local authority to benchmark their performance.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AUGNET LTD.	Augnet: Using Internet Protocol as the SMS Data Communication System	£475,720	£333,004

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
UK SME Augnet has developed a revolutionary data communication system to address current challenges faced by the SMS industry. With a globally renowned team of industry and technology expertise, Augnet seeks to further advance its patented technology through this Industrial Research project. Currently, SMS delivery cannot be tracked, creating a lack of compliance and overall mistrust throughout the value chain. Augnet's technology is a world-first, with the capability to track 100% of SMS message delivery, bringing the ability to instigate compliance, governance and quality standards. This transformative solution provides SMS originators with a strong alternative to the current outdated market provision. As well as the formation of an industry-leading team and company advisors, including ex-Skype / Microsoft Senior Manager and international telecom leaders, Augnet has secured pre-seed investment from 16 industry expert investors demonstrating the capability to deliver this game-changing innovation to the market.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MASHTRAXX LIMITED	MediaFinder: a content-based recommendation system for user-generated audio-visual content	£345,183	£241,628

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
In recent years, the use of deep learning methods has pushed the boundaries of AI, leading to immense advances in a number of cutting-edge technologies, including self-driving vehicles, facial recognition systems and fraud detection services. At Mashtraxx Ltd (MXX), a team of experienced AI researchers has brought the power of deep learning to music recommendation. The science is inspired by cutting-edge computer vision technologies, which successfully solved complex tasks such as detecting objects in satellite pictures or recognizing individuals in images. MXX has developed a suite of tools for intelligent music production, editing and consumption. Among our new research is a content-based **music recommendation system,** which allows users to search large music collections using an audio track as a query. Through initial discussions of this technology with social media platforms, and our own mobile app, we have identified an unmet need for a complementary **video recommendation system** for online platforms, which can cope with the more difficult challenges centred around user-generated videos as well as music. This MediaFinder proposal will be a substantial step-change in recommendation technology, which will disrupt several sectors.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SPG INNOVATION LIMITED	Smartsalt – Optimising the production of a novel salt ingredient	£159,952	£111,966
University of Nottingham		£68,036	£68,036

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
SPG Innovation and the University of Nottingham will demonstrate the commercial viability of a novel salt reduction ingredient which will maintain the saltiness perception for consumers whilst reducing the overall content of sodium in food product.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CROP HEALTH AND PROTECTION LIMITED	SlugBot: Autonomous Slug Monitoring and Bio-molluscicide Treatment System	£133,897	£133,897
AV and N Lee		£5,414	£3,790
COSMONIO LIMITED		£177,772	£124,440
SMALL ROBOT COMPANY LIMITED		£161,052	£112,736

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
The proposed project is a feasibility study to develop an innovative game-changing technology for autonomous slug monitoring and precision bio-molluscicide treatment system. Slugs are major pests in agricultural and horticultural crops, with current methods for control relying on chemical molluscicide pellets, containing either metaldehyde or Iron (Ferric) phosphate. Bio-molluscicides are also available as nematode based products, but these are not economical for use in arable and oilseed rape crops. Therefore, there has been an over reliance of metaldehyde which has led to a negative impact on UK water systems, as well as on non-target organisms. This has initiated a push to promote slug monitoring, however current methods are laboursome with many farmers not partaking in this key practice. Therefore, there continues to be unnecessary applications of chemical molluscicides leading to a market demand for an autonomous slug monitoring system, with data generated for the cost-effective precision treatment with bio-molluscicides. The outputs of the project have the potential to have a significantly impact on the UK economy by helping farms achieve increased yields through enhanced slug monitoring and control. The project also brings environmental benefits by opening a wider market for bio-molluscicides, thus reducing the reliance of metaldehyde. The project is initially targeted to the UK arable and oilseed rape market, with the aim of taking the technology international.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Echopoint Medical Ltd	Miniaturisation and design-for-manufacture of a fibre-optic pressure and flow sensor for guiding minimally invasive cardiovascular therapies	£488,575	£332,231

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
Echopoint Medical are a new med-tech start-up who are focused on developing new technology to significantly improve diagnosis and treatment of cardiovascular disease (CHD). Globally, cardiovascular disease is the leading cause of death among women and men (1.8M patients in the UK). Many of these patients have narrowings or blockages of blood vessels in their heart that limit blood flow, which can lead to chronic pain (angina) and heart attacks. One of the most common treatments is to use a wire mesh tube, known as a "stent", to hold the diseased vessel open and restore adequate blood flow to the heart muscle. During the implantation of these stents, clinicians' treatment decisions are often guided by data from medical devices placed inside the arteries of the heart. However, today's devices provide only incomplete information about disease in the heart and consequently many patients are incompletely or incorrectly treated. Women with cardiovascular disease are underserved: compared with men, they present with a higher burden of symptoms and experience similar or worse outcomes, but are less likely to have obstructions that can be treated by stents. Echopoint will address a key need: to provide concurrent pressure and flow measurements from inside coronary arteries to significantly improve diagnosis and treatment for patients with cardiovascular disease -- particularly those with obstructive coronary artery disease and coronary microvascular dysfunction. The applicants have developed new technology that uses miniature fibre optic sensors to measure both blood pressure and flow from inside arteries. These sensors will provide key clinical data to improve clinical decision making about whether to place a stent in the vessel and also to guide treatments for patients who do not receive stents. Funding from this project will be transformative and enable Echopoint Medical to offer a cost-effective product for the NHS. Our current sensor has been shown to be highly accurate; however, we face two key challenges: 1) a size reduction to permit integration into devices called guidewires that are used in current clinical practice and 2) a significant reduction in manufacturing costs. For the first, we will perform the key step of reducing the sensor from two optical fibres to a single optical fibre: a challenging but attainable with close links to the University College London. For the second, we will work closely with manufacturing subcontractors in the UK to ensure scale-up with significant cost reductions for competing effectively in global markets.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
UVAMED LTD	Development & commercialisation of 100% recyclable, compartmented, colour coded anaesthetic syringe trays to reduce medication errors in anaesthesia	£273,674	£191,572
University of Derby		£117,256	£117,256

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
The most frequently cited critical incidents in anaesthesia are drug administration errors. Unlike in the inpatient hospital ward setting, perioperative medication administration today often bypasses standard safety checks, such as electronic physician order entry with decision support, pharmacy approval of specific drugs before administration, and multiple nursing checks at the time of medication administration. Furthermore, the high-stress, time-sensitive nature of operating room care may lead to both higher rates of medication errors (MEs) and errors of high severity. Current practice prior to administration usually involves all the drugs being placed together with respective ampoules in a single non-compartmentalised tray made from either paper pulp or polypropylene therefore prone to syringe swaps, medication error and with limited or no infection control. In collaboration with University of Derby, through this 18 months industrial research project, we (UVAMed Ltd) are developing completely compartmented, IS26825:2008 colour-coded, bacteriostatic, anaesthetic syringe trays (called Rainbow-Trays) designed with human factor principles to reduce medication error by assisting anaesthetists in the medication preparation and administration process.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CAURA.ME LTD	Developing new <1mm microneedle sensors to actively and painlessly monitor the key indicators of energy levels, metabolism and fatigue in biomarkers under the skin in real-time	£418,519	£292,963
Loughborough University		£33,951	£33,951

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
The human body is unique, with each person having varying metabolic needs, energy expenditure and a diverse response to exercise and food. Quantifying how diet, hydration and exercise impact our bodies in such singular ways is currently impossible outside of the lab, with people currently reliant on wearables that provide generic data such as heart-rate, body weight and movement data. Whilst the wearable technology market is still rapidly growing £21.5bn by 2022 (233m_unit_sales), innovation in the sector has slowed ([Forbes:2018][0]) and the vast majority of devices still feature the same sensors (GPS_heart rate_accelerometer)as 10 years ago. We are a sensor start-up based at the Imperial College London Translation and Innovation Hub that develops innovative personalised health and wellbeing sensor devices. Working in partnership with Sports Science department of Loughborough and British Triathlon athletes, we intend to develop the world's first molecular performance tracker - monitoring biomarkers in the bodies' dermal interstitial fluid just below the skin in real-time, to provide insights on energy, metabolism, fatigue, blood-sugar level and diet to help optimise training, improve diet, prevent exhaustion and reduce the risk of fatigue-related injury. The ability to unobtrusively monitor the bodies' biomarkers in real-time has significant wider potential as both a personal health monitor- helping people understand when to eat, hydrate, rest etc. (personal & military markets) and as a medical device- providing real-time monitoring of biomarkers indicators of health conditions (e.g. diabetes, sepsis etc.) [0]: https://www.forbes.com/sites/paullamkin/2018/10/23/smart-wearables-market-to-double-by-2022-27-billion-industry-forecast/#3231bbac2656

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ULTROMEX LTD	Scale-up and demonstration of Carbomex: a novel system to treat & recycle hazardous Spent Pot Liner, creating secondary resources with zero waste to landfill	£495,123	£222,805

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
Aluminium is the second most used metal after steel. Primary aluminium smelting (extracting metal from mined raw material - bauxite) is a major global industry; some 64.3M tonnes of aluminium were produced in 2018\. With light weighting of more and more metal products, production is set to increase further in the years to come. A major waste stream arising from primary aluminium smelting is Spent Pot Liner (SPL). Some 1.4M tonnes of SPL was created in 2018\. The pot liner is the carbon and refractory lining of the cell or 'pot' where electrolysis is used to extract aluminium metal from alumina. Over time during the operation of the cell, substances, including aluminium and fluorides are absorbed into the lining. After a period of use (several years) the lining fails and needs to be replaced. The old 'spent' liner is SPL. In the EU, USA and many other parts of the world, SPL is designated as a hazardous waste because: * It contains toxic fluoride and cyanide compounds leachable in water. * It is corrosive - having high pH due to alkali metals and oxides. * It is reactive with water - producing flammable, toxic and explosive gases. Unfortunately there are few good solutions available for SPL. Presently, most SPL is either permanently stored at the smelters' site or sent to controlled landfills. These are expensive solutions and may create future problems. Ultromex has developed an innovative process for treating SPL removing all toxic compounds, evolving no gases to atmosphere, creating no hazardous effluent and leaving behind no wastes; all outputs from the process being turned into secondary resources for use by other industries. The process, using Ultromex plant & equipment is designed to operate at the smelters' site and be cost effective to purchase and operate. Developed from proof of concept Ultromex now seeks to build a small-scale commercial demonstration plant to showcase the technology and validate the techno-economic performance. Once deployed commercially, Ultromex plants will be the solution the industry has been seeking to deal with current SPL arisings, stockpiled SPL and even previously landfilled SPL, resolving the SPL problem permanently, sustainably and at an economic price point.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ITALIC PIG LIMITED	Bobrossatron Image Atomisation	£317,802	£222,461

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
Italic Pig is blazing trails in the realm of Arcade Art, a new genre of gaming engineered to make art more accessible. Our game mechanic follows in the footsteps of incredibly popular talent games like Guitar Hero, Sing Star, Dance Dance Revolution and Piano Tiles. We provide players with any level of artistic talent with the ability to recreate classic masterpieces in a few minutes. The end product has already proven to be innovative, and exciting to both publishers and platforms. However, the internal process required to bring a flat image to a layered, playable game level is an arduous combination of meticulous detail, artistic interpretation and repetitive procedure. With the first iteration of our new game already in soft launch, we are aware that a constant flow of new content will be necessary to sustain the audience. We are also aware that the creation of the content is the most time-intensive part of the process... but it may not have to be. With the assistance of Innovate UK, we intend to perform a feasibility study to determine: * if a machine can be taught to recognise distinct elements (subjects, objects, layers) within a flat image of any style (from photo-real to impressionist) * if a machine can recognise a partial visual image, and extrapolate to complete the image, with help from our existing internal data set of 200 layered images * if, once developed, the atomisation and stroke assembly process could be made efficient enough to occur within the end product, such that a photo could become atomised (and instantly playable) * if the technology of partial image recognition and extrapolation has applications in other sectors While the motivation for this research is enterprise-driven, a key part of our internal pipeline (what we refer to as "atomisation") has potential applications across many sectors. At a high level, we are teaching a machine to identify and differentiate specific objects within a flat image, separate flat images into perceived layers, and interpret and complete missing visual data, which could potentially have applications in historical restoration, health, security, AR and even satellite imagery.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
KYMIRA LTD.	Bumpe: A wearable smart garment to prevent stillbirth	£270,179	£189,125
Radical Fibres Ltd		£109,996	£76,997

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 the UK, 1 in every 225 births is a stillbirth (baby born dead after 24 completed weeks of pregnancy); equivalent to 3,400 babies dying each year. Around nine in ten stillbirths occur before the onset of labour. One in three stillbirths occur in babies who have reached term and seem to be completely healthy. Women who have suffered stillbirth can develop mental health problems afterwards; one study showed women experiencing stillbirth were 4x more like to have depression and 7x more likely to have post-traumatic stress disorder compared to women having live births. The results are long-lived, with women reporting anxiety and depression up to two years afterwards. Over 50% of mothers experiencing stillbirth noticed slowed fetal movement beforehand. However, movements differ between women and between pregnancies, and perceptions of movement are subjective. KYMIRA, a market-leading developer of e-textiles successfully commercialised within the performance sports sector, now wish to create a wearable technology for non-invasive, 24-hour fetal movement monitoring deploying a polyvinylidene fluoride (PVDF)-based piezoelectric sensor to help prevent stillbirth. This project will enable KYMIRA and Radical Fibres Limited to fully develop and test a prototype in a clinical setting, generating safety and efficacy data to inform a post-project clinical trial. These outputs align with the 2016 National Maternity Review, which recommends personalised care based on unbiased information.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PLANT ECOLOGY BEYOND LAND (PEBL) CIC	Native-Nori: UK-Native Seaweed (Nori) Aquaculture for Nutrient-Dense, Low Resource-Use Foods	£42,654	£29,858

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
Vision: To develop an aquaculture technology to cultivate novel seaweed food ingredients with superior nutritional value and a net positive impact on the environment. Innovation: The aquaculture technology will consist of three core steps; 1\. To harvest wild reproductive seaweed, 2\. To germinate juvenile seaweed in an aquaculture system, 3\. To grow-out and harvest seaweed in an intertidal growout system. Each process step is designed to consume minimal resources with the final step providing valuable ecosystem services such as remediating eutrophic coastal waters, sequestering dissolved carbon dioxide and providing nutrition and habitat for intertidal marine life. Project Focus: The project aims to assess the technical, economic and environmental feasibility of implementing a novel aquaculture process. Plant Ecology Beyond Land CIC (PEBL) has the expertise in seaweed analysis, seed harvesting and marine engineering. Collaborator Pontus Research Ltd (PR) has the complimentary expertise in aquaculture cultivation. The outcome of this collaboration will be a comprehensive feasibility assessment that will provide detailed operational plans, environmental impacts, and the financial viability to run such an operation over the long term. Objectives: - Monitor, analyse and harvest seaweed starter seeds. - Trial incubation of seaweed seeds into juvenile seaweeds and transferring these onto nets. - Deploying seeded nets out in an intertidal site and monitoring the growth development. - Assessment of seaweed quality, environmental footprint and ecosystem service provision potential. Impact: Native-Nori will provide a new means of producing highly nutritional food (average of 25% protein) with limited land-use, low energy input and zero-use of chemicals. In addition, the growth of seaweed absorbs excess nitrogen, phosphates and carbon dioxide and creates new habitats for intertidal wildlife. This has the potential to provide further net positive environmental impacts on the environment. The project will allow PEBL and PR to generating revenues of £1.7m and 18 new jobs by 2025 assuming a sea farm of 30 hectares producing a dry weight (DW) of 16 ton/ha*yr (compared to average production of 2.3ton/ha*yr for soya and 5.1ton/ha*yr for corn) sold at an average price of £2,000/ton raw and £45,000/ton dried and packaged. This sea farm would have the potential to create an additional income through providing ecosystem services by sequestering 0.32, 0.032 and 4.36 tons/ha/year of excess nitrogen, phosphate and CO2 respectively \[World Bank Group, 2016\].

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RAPID POWDERS LIMITED	RENDER: Regenerated Laser Sinter Powders	£109,889	£76,922
EURISCUS LIMITED		£69,815	£48,870
Lancaster University		£59,979	£59,979

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
Selective Laser Sintering (SLS) is the most important thermal fusion additive manufacturing (AM) process utilising lasers to melt layers of metal or polymer powder on to each other and Nylon PA12 base powders occupy 95% of the polymer SLS market. One of the barriers to the adoption of SLS is the process cost and cost of disposal of waste un-sintered powder that's considered a microplastic having the potential to cause environmental harm generally to aquatic living organisms and to accumulate in rivers and soils. AM bureaux are experiencing difficulties in finding landfill sites that will accept this waste. Discarded SLS powder represents a significant cost and approaches to utilise it have focused on the production of fused deposition manufacturing filaments; and although feasible, none are commercially available nor enable a closed manufacturing system. Rapid Powders Ltd has identified and shown the feasibility of a solution to this problem and seeks through grant funding to establish its technical and commercial viability together with its consortium partners Euriscus Ltd and Lancaster University.

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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
ROBOSCIENTIFIC LIMITED	Automated monitoring of Dairy Cattle for Pre-Clinical Ketosis and other conditions	£119,302	£83,511

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 is a feasibility study to establish if the RoboScientific VOC (Volatile Organic Compound) sensing system can be used to monitor the breath of individual dairy cattle in the milking parlour to give early warning of disease and other conditions. This system monitors the VOC "fingerprint" of the breath and compares it with other fingerprints held in a memory library. Initially the system will be trial tested to detect sub-clinical ketosis which has a major economic impact upon farmers. Sub Clinical Ketosis (SCK) needs to be detected more efficiently and accurately by Dairy Farmers to reduce their economic losses. It currently goes largely unseen and accurate blood tests are expensive and undertaken infrequently. SCK affects both the Dairy and the Beef industry and impacts upon productivity and profitability. Its incidence has been cited to be as high as 60% in some literature. Based upon a cost per head from Esslemont, BVCA, of £560; a potential cost to the UK herd of over £1.5bn a year. The incidence of SCK varies internationally, with key European and North American markets experiencing rates of between 20-40%. In the USA, with a dairy herd of 18m this translates to potential losses of over $12bn annually. The EU herd is even larger at 28m. The system would be extended to monitor for other diseases and conditions (including individual beast methane output levels) and developed into a fully automatic system for incorporation into robotic milking systems.

Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

Total available funding is £25 million across Stream 1 and 2.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OXFORD HIGHQ LTD	Compact chemical sensor for real-time environmental monitoring of contaminants in water	£402,426	£281,698

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
Oxford HighQ is a spinout from the University of Oxford's Departments of Materials and Chemistry that is developing next-generation chemical and nanoparticle sensors. Our core technology of optical microcavities provides fundamental enhancement of signal strength that will offer a step change in fluid-based sensing across a wide range of applications and markets. The company was incorporated in October 2017 building on 10 years of research within the University. This Innovate UK project will provide support for the construction and field-testing of four miniaturised remote autonomous total phosphate sensors for environmental monitoring in rivers and lakes. A parallel R&D programme will advance the technology to provide greater breadth of analytical targets, allowing the technology to speciate and quantify an array of pollutants in water supplies -- a key challenge for environmental regulatory authorities, water supply companies, and researchers. If successful, this project will provide a low-cost, portable, real-time method for speciating and quantifying pollutants in natural waterways, allowing targeted intervention, reducing capital expenditure and operating costs for water companies. This device would then act as a platform from which we can target emerging contaminants of concern, including pesticides, herbicides, and pharmaceutical contaminants in water supplies.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
THE WORKCAST CORPORATION LIMITED	WorkCast Webinar AI Editor	£348,049	£243,634

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
WorkCast are a leading provider of online hosted events such as webinars and webcasts. We are steadily growing our market share in the UK and US and have recognised an opportunity to introduce a novel feature to the market that will expand the value of content produced for webinars by allowing users to automatically create multiple shorter edits for use on social media and other marketing platforms. We will develop an innovative AI Editor for webinar content that allows users to create edit scenarios based on specific content sub-themes. A series of potential short clips based on the selections will then be automatically compiled from the webinar content and presented to the user, allowing them to save and export as required.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
YES RECYCLING LTD	Optimisation of Plastics Recycling to Achieve a True Circular Economy for Technically Demanding Applications	£285,938	£200,157
ADRECO LIMITED		£211,978	£148,385

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 consumption and mismanagement of plastic waste cannot continue. **_Globally, around 8 million tonnes of plastic waste is added to the world's oceans every year and the marine environment is now an area of major concern._** It is important to note that: *Waste plastics can require hundreds of years to decompose *Single-use plastics discourage recycling and re-use, thus increasing disposal problems Recycling plastics into low grade applications does little to reduce demand for virgin plastics. By improving the properties of recycled plastics, we can use them in more technically demanding applications. **_By designing circular economies and recovering materials for the manufacture of replacement items, the UK could reduce raw material imports and virgin plastic consumption by up to 50%_** \[GreenAlliance\]. Hard hats are just one example of an unsustainable market model. Regulations dictate that they must be disposed of at least every 5 years to maintain safety and impact performance, but they are challenging to recycle - degradation occurs in use and during the recycling process. Despite hard hats being a useful source of plastic, they aren't currently accepted for commercial recycling. Current hat designs require virgin plastics to obtain good strength properties and removal of the hat's suspension system is labour intensive. **_To support the high-level objective of improving recycling rates and reducing consumption of virgin material, Yes Recycling will begin by creating the world's first circular economy scheme for hard hats._** By delivering our innovative solution, we will contribute to solving a critical problem, whilst generating £19 million in accumulated profits and creating around 60 new jobs within 5 years of project completion. This project will help us meet our own business objectives, but more importantly it will help encourage broader recycling activities, demonstrating that they can be carried out profitably. This project creates a lucrative business opportunity and will prove that recycling into technically demanding applications can be successful. **_This will reduce the amount of new plastic that is consumed, reduce waste and deliver tangible benefits in waste reduction and environmental impact._** Yes Recycling has state-of-the-art facilities in Buckinghamshire, significant expertise in operating advanced recycling processes and a strong track record of successful innovation. We have secured major recycling contracts, which reflects the strength of our processing knowledge and extensive facilities. This includes re-processing of shredded bank notes on behalf of the Bank of England.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MYNDR LTD	Myndr Peer-to-Peer mental health support system	£202,389	£141,672
KOMODO DESIGN LIMITED		£230,689	£161,482

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 creation of an AI based mental health peer-to-peer support application that offers users the ability to interact with other users with similar symptoms and conditions.

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

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OCEANIUM LTD	Oceanium: biorefining kelp to produce novel alternative protein and fibre sources	£249,498	£174,649

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

Biorefineries are integrated facilities that convert renewable biomass raw materials (e.g., wood, crops, manure) into fuel, power, and chemicals. Biorefineries have the potential to play an important role in reducing our reliance on fossil fuels, reducing global greenhouse gas emissions, and delivering sustainable, carbon-neutral biobased products and energy to meet the needs of our rising global population.

Seaweed has recently received significant attention as a potential biomass raw material that does not require land during production; thus, avoiding the "fuel versus food" debate in Europe associated with land-based biomass raw materials such as oilseed rape. In addition, seaweed production does not require freshwater, fertiliser, or insecticides.

However, numerous studies to date (Bruhn et al., 2011; Adams et al., 2017) have demonstrated that the increased costs associated with cultivating, harvesting, transporting, and processing seaweed make seaweed uneconomic as a sole source of biofuel (value of less than £1/kg; Cefas, 2016). A biorefinery approach addresses this economic challenge by co-extracting biochemicals from seaweed. These biochemicals create a "pyramid of value" for seaweed (Cefas, 2016), encompassing added-value commodities (value of £1-£5/kg), speciality products (value of £5-£1,000/kg seaweed), bioactives (value of more than £2,000/kg), and special applications (more than £5,000/kg).

Based in the European Marine Science Park in Oban, Oceanium is a biotech start-up developing an innovative seaweed biorefinery process for the sustainable production of food ingredients, nutraceuticals, and biopackaging from UK farmed kelp. Kelps are large brown seaweeds, which grow in dense growths or forests, providing habitats for numerous invertebrates, fish, marine mammals, and birds.

With funding from Innovate UK/Sky Ocean Ventures, we are currently developing the biorefinery process steps for producing marine-safe biopackaging from farmed kelp, as a replacement for plastics. We rely on sustainably farmed kelp to avoid the environmental damage potentially associated with large-scale wild harvesting of kelp.

In this proposed project, we will develop the biorefinery process steps for co-extraction of protein and fibre from kelp, delivering novel alternative protein and fibre sources. We will sell these new products to key speciality chemicals/food ingredient suppliers, who are urgently looking for new, sustainable, clean-label, allergy-free, and vegan sources of protein and fibre to meet growing consumer demand.

By developing the processing infrastructure for extracting value from seaweed, we will enable and support the sustainable seaweed farming industry in the UK/EU to scale.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
WIRTH RESEARCH LIMITED	Wirth AirDoor - Phase 2	£353,290	£247,303

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 Project aims to solve the problems caused by temperature differences between a building and its external environment -- a problem exacerbated by wind -- to a level far in excess of the existing market-leading solution, the Air Curtain, which themselves consume vast amounts of energy. The device being developed, which will form part of the infrastructure of a building's entrance, will allow retailers and other commercial buildings to minimise energy loss from wind infiltration and all of its associated issues. Despite Air Curtains being widely deployed, this issue is estimated to cost UK retailers over £1billion per year. The Project builds on the successful, Innovate UK-funded development of a prototype AirDoor, laying the foundations to take the product to the mass market.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
UNILEVER U.K. CENTRAL RESOURCES LIMITED	Furafact: Novel high performance furan surfactants from biobased building blocks	£196,519	£98,260
CRODA EUROPE LIMITED		£94,294	£47,147
NNFCC LIMITED		£56,572	£39,600
University of York		£147,756	£147,756

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
Surfactants are chemicals with both hydrophilic (water loving) and hydrophobic (water hating) regions, which makes them extremely useful for mixing oils and water, stabilising foams and removing dirt from surfaces and laundry. As a result, surfactants are used across a broad array of industrial sectors and products, including laundry detergents and cleaning, personal care (shampoos, hand and body wash liquids), plant protection as wetting agents, in paints and coatings and as emulsifiers in pharmaceuticals. Most of the surfactants available today are substantially derived from fossil fuels. Biobased surfactants could be an alternative but those that are currently available have limited functionality and are typically 3 to 5 times more expensive that fossil-based surfactants. However, customers and consumers are demanding sustainable biobased ingredients and there is a real need now for highly functional, biobased surfactants for an array of applications. This project will demonstrate the potential for a novel family of biobased surfactants, based on the furan headgroup derived from sugars from waste agricultural residues, to replace fossil-derived surfactants. Led by _in silico_ data modelling, a number of furan surfactant variants will be selected for synthesis and testing. A commercially relevant process for manufacturing the lead furan surfactants will be demonstrated at lab scale. Availability of suitable feedstocks and building blocks to manufacture the furan surfactants in the UK will be mapped. Potential furan building block producers, feedstock converters and customers will be invited to engage with the project via a stakeholder board to align Furafact both with the UK chemicals manufacturing industry and customer demands.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SAMSON VTI UK LIMITED	Project Longbow: Enabling affordable and intelligent digitalisation to manufacturing SMEs.	£498,337	£348,836

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
SamsonVT is a UK-based SME seeking to be a world-leading industrial digital technologies (IDTs) providers by transforming the way in which manufacturing SMEs use their data. The project will create an affordable solution, for SMEs, allowing them to make sure of their unstructured data, generate new data insights and trends which will help support their operations, productivity and growth.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SONOCENT LTD	Sonocent: Glean Stream	£491,203	£343,842

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
Sonocent's "Glean" is a note-taking platform for capturing, organising and utilising information from conversations and presentations. Glean is an evolution of Audio Notetaker, our innovative software that turns audio into visual blocks. Glean addresses the core challenge of note taking; trying to engage in the moment while capturing the valuable parts. It provides distraction-free note taking, helping users create more valuable notes by breaking up the process. It also integrates the notes with multimedia, including relevant supporting material. Most importantly, we have taken our learnings from academic research and Audio Notetaker user feedback and designed Glean from the ground up to be accessible and enjoyable to use. Glean is currently used almost exclusively by students with disabilities who receive additional learning support. This project will address core barriers to widening its application to all learners as well as aim to provide more functionality for teachers themselves in order to fully integrate Glean into the classroom.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VISUSNANO LIMITED	Towards Dropless Cataract Surgery: MEDILens, a Drug-eluting Intraocular Lens	£322,006	£225,404

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
VisusNano is a medtech start-up company that is developing a drug-eluting intraocular lens, for use in patients undergoing cataract surgery. By improving patient outcomes, removing the need for eye drops after surgery, our technology has the potential to revolutionise cataract surgery in both the human and veterinary markets. Cataract, defined as opacification of the lens within the eye, is the commonest cause of blindness worldwide. The only cure is surgery and it main risk is postoperative inflammation that causes pain and, if left untreated, visual loss. This can be prevented with an intense administration of eye drops. 20k domestic animal cataract operations are performed each year in the UK. Each requires postoperative drops up to 6 times per day for 3 months. Often dogs and cats owners cannot afford this intensive treatment schedule, so the animals do not have surgery and become blind. In the UK, more than 400k surgeries are performed each year in humans. After surgery care requires drop administration up to 4 times/day for a month. If patients cannot self-administer the drops, family is asked to support their older relatives, adding to the unpaid carer burden. Unfortunately families cannot always help, so nurse's support is needed at a high cost to the NHS (\>£55M/year) and burden for a hospital eye service that is already "on its knees". MEDILens is a biodegradable lens that can release anti-inflammatory drugs into the eye, obviating the need for eye drops without compromising the properties of the lens. The innovation is protected by patents. The Innovate UK funding would allow us to test the safety and efficacy of MEDILens on animals, so to develop a veterinary product and a prototype for the human market within 18 months. We are planning to present our results to conferences and publish them on high impact factor journals. With MEDILens growth opportunities and secondary markets are substantial. Not only the IOL market is growing because of the ageing population, but MEDILens can be easily modified to incorporate other drugs to treat different diseases. Our company's success lies in our diverse skill mix. Our team has expertise in drug delivery development, ophthalmic surgery, clinical trials and project management. An ophthalmologist and a veterinary ophthalmologist are integral to the team and ensure that the developed product is fit for their end-users.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
COGNITIVE.BUSINESS LTD	Wind-AI: Wind Turbine Performance modelling utilising Deep Learning with LIDAR Validation	£413,667	£289,567
E.ON CLIMATE & RENEWABLES UK LIMITED		£0	£0
OFFSHORE RENEWABLE ENERGY CATAPULT		£32,600	£32,600

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
The UK has significant wind power resources and leads the world in offshore wind power generation. In 2018 the wind industry provided 17% (57.1 TWh) of the UK electricity supply \[UK Energy Statistics, 2018\] and is forecast to increase substantially over the coming decade \[National Grid FES\]. In order to ensure renewable energy can be deployed effectively to combat climate change and to ensure costs to consumers remain low the industry must continue to develop new technologies and operate more efficiently. Currently wind turbines can incur significant hidden losses and must routinely be tested for performance loss. This reduces the amount of power they can generate and increases the costs of operation. This project will develop a unique method for accurately predicting wind turbine output and hence enable the monitoring of performance losses for every wind turbine at a farm without the need to regularly perform performance testing. An accurate online performance monitoring technology would allow wind turbine operators to reduce the risk of structural blade failure and other common component failure (such as yaw or pitch actuation). The project will provide robust evidence to the industry that validates the technology as a credible monitoring technology for the optimisation of site yield and reduction in periodic maintenance; reducing costs and increasing asset production. The technology will enhance the UK's position as leader in effective management and optimisation of wind assets, reducing the cost of energy for consumers and lowering the Levelised Cost of Energy (LCOE) by up to 2.7% (based on ORE Catapult modelling). This project will provide the basis for a UK technology to be exported to the global wind industry, creating skilled jobs, and supporting further deployment and utilisation of wind farms to help combat climate change.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Combine AI	Improving virtual meeting productivity with an advanced automated assistant	£397,237	£278,066

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 industrial research project delivers a prototype virtual assistant that provides productivity enhancements for virtual meetings. The prototype will be powered by artificial intelligence that aims to understand multiple characteristics of meetings and communicate this with meeting stakeholders.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BIOCEL BIOLOGICAL LIMITED	The development and production of a scar reduction cream and wound dressing	£195,996	£137,197

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
Worldwide 234 million major operations are performed annually. Ten percent of patients will suffer from abnormal scarring in the form of hypertrophic or keloid scar. Cosmetically displeasing these scars can lead to reduced mobility, pain and psychological trauma. Currently, addressing this significant and age-independent morbidity is a significant unmet need. Biocel Biological has developed and patented a novel therapy that reduces all scarring especially keloid. Our 12 month phase 1 project is to develop our gel to achieve maximum gain for patients undergoing surgery, those patients with acne and burn scars. We anticipate a gel will be available for the market in 1 year. Our method involves the use of amnion, which can be sourced from a variety of non-human sources, to be incorporated into a restorative gel. This is exploiting a hitherto waste product and has the potential to create significant UK enterprise. Successful launch of our gel will be reinvested into R&D for our phase 2 study to make wound dressings for acute and chronic wounds from surgery, diabetic ulcers and venous ulcers. This phase of the study will involve the regulatory pathways to ensure medical device compliance with the MHRA and collaboration with the local AHSN for adequate testing and entry into the NHS.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RAPIERE SOFTWARE LIMITED	ECCOlab - Energy Carbon & Cost Optimisation for construction industry	£498,391	£348,874

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

Rapiere Software Limited **(RSL)**, through its cloud-based product **ECCOlab** offers the key instrument to all building professionals (architects, engineers, investors, building operators) and users alike to navigate challenges of satisfying the UK/EU 'Near Zero Energy Buildings' (NZEB) and similar regulations in other parts of the world, that usually require minimising buildings' carbon/energy footprint at a feasible cost. All of that is delivered in an audited way, using mathematics, physics and economics; this makes ECCOlab, with some localisation, deployable anywhere in the world. By using knowledge-based approach through expert systems and Artificial Intelligence (AI) optimisation, the entire platform is delivered through a collaborative effort of the industry-leading experts in the respective fields of Energy, Carbon and Cost, as well as Information Technology (IT).

Our objective is to build on Building Information Modelling (BIM), but change focus from performing sub-optimum simulations and evaluations to the **_optimised building solutions,_** offering a genuine new quality which would not have been explored before due to time and cost pressures on the design process. Putting it simply, while you might spend a few months exploring and refining 3-5 building options for a given site context, all of them probably sub-optimum -- now you can have an **_actual energy-cost-carbon optimum in one-tenth of the time or less_**, with another 10 options closely ranked by the user-defined criteria. This is, by many users' accounts, a very compelling argument.

We also wish to make **life-cycle carbon** _the_ method of assessing carbon impacts instead of the commonly-used, flawed operational carbon indicator; the optimum solutions reached through life-cycle carbon assessments are frequently very different from the ones focussing on operational characteristics only.

How to deliver a cost-optimum, sustainable-as-can-be solution, satisfying the new (inter)national regulations which are on the way, bearing in mind these, frequently conflicting requirements?

Answer: ECCOlab!

ECCOlab will research, develop and implement 3 items based on the existing software platform:

1\. **Building Solution Optimiser** -- based on an Expertise-managed chosen multi-parameter space, Optimiser manages scenarios, monitors results and **automatically delivers optimised** building **solutions**, ranked according to the user-defined criteria; utilises AI and ranges to prevent unrealistic outcomes.

2\. **A set of 3** **fully attributed Templates** of medium sized buildings of 3 different types: a multi-apartment block, an office block and a school.

3\. **A new cost model**, with an appropriate resolution for the above items, with **external feed** of construction cost information, adjustable to various world locales and time-sensitive.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Off World Live Limited	Off World Interactive 360 degree XR live-streaming	£303,053	£212,137

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
We develop live, interactive, XR broadcasting solutions and offer them to prosumers and enterprise partners in a range of different software solutions. We streamline the process of creating and delivering interactive XR and digital content opening up the content format to the full imagination of global creators.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PRAGMATIC PRINTING LIMITED	Enhanced P-type metal oxides for Integrated Circuits (EPIC)	£191,634	£134,144
PEGASUS CHEMICALS LIMITED		£158,088	£110,662
University of Liverpool		£149,488	£149,488

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
The proliferation of smart objects required to truly harness the full capability of the Internet-of-Things (IoT) is enabled by the form-factor and cost-structure of flexible oxide electronics. In this sector, state-of-the-art is based on established unipolar n-type transistors (NMOS). It addresses many emergent application spaces e.g. short-range (cm) proximity radio-frequency identification (RFID) tags, but its high static power consumption precludes very low power applications and complex circuit designs. A complementary (CMOS) logic capability greatly expands the accessible market for low cost flexible electronics, where static power consumption is negligible. CMOS would augment current product functionality and generate brand new applications through increased read-ranges, introduction of additional security circuitry and sensing capabilities, supporting a wide-range of low power complex designs. Examples of applications that can be addressed include waste management (e.g. low-cost identification to improve recycling productivity) and anti-counterfeit labels which protect against low-grade or harmful ingredients. New applications will also emerge as part of the IoT and increased connectivity. These include healthcare monitors, connecting wearables with disposable/low-cost sensors and distributed sensor networks (e.g. building control/monitoring; security/detection of poisons, pollutants, etc.). IoT will play key roles in smarter cities, increased industrial productivity, resilient transport and more sustainable energy consumption. The social benefits of the technology will include improved quality of life, healthy living and increased employment. Introduction of CMOS flexible electronics necessitates p-type transistors (PMOS) alongside the existing NMOS technology. This can only be achieved through innovation and development of p-type thin film transistor (TFT) materials and associated manufacturing processes, which are comparatively immature. EPIC is a collaborative research and development project between the University of Liverpool, Pegasus Chemicals, and PragmatIC to develop p-type metal oxides with optimised properties suitable for future integration into a CMOS Flexible Integrated Circuit (FlexIC) architecture. Scale up and manufacturability of the optimised p-type material will be demonstrated on a 200mm FlexIC pilot line.

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

Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

Total available funding is £25 million across Stream 1 and 2.

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
ZOYO TECHNOLOGY LIMITED	Facilitating foreign investment into UK SME's: dramatically speeding up the FCA KYC/AML and investment execution processes through innovative technologies.	£454,880	£318,416

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
Building upon recent deregulation and the rapid growth in wealthy middle-class investors in South East Asia, Zoyo Technologies are developing the first multi-jurisdictional trading platform to enable High Net Worth Individuals (HNWI) from India and China to invest in UK-listed companies for the first time - opening a £40bn investor market for UK SMEs to tap into for investment and funding. The project is the result of a number of key market trends including the rapid growth in retail investors in India and China; loosening of restrictions on foreign investments and a strong desire to diversify their portfolios - particularly with British companies. Currently this market is chronically under-served with all traditional financial institutions, banks and brokerages focusing on larger, fund transactions - rather than individual investors and investments. This is in part due to the high levels of due diligence required on each investor per transaction under established FCA Know Your Customer (KYC), Enhanced Due Diligence (EDD) and Anti-Money Laundering (AML) regulations. Whilst a vital part of regulatory protection, the process itself in terms of collecting information, validating and notarising documentation and cross-referencing this against national and international datasets is highly time consuming, involves a large amount of paper documentation and needs expensive, labour-intensive expertise just to confirm an identity. The result is that this process can take 3 weeks+ to complete, by which time conditions may have changed and investors' appetite waned. Additional continuous KYC re-certification is a regulatory requirement across all jurisdictions (best practice 6 monthly) and is currently subject to the same rigour, process and cost of initial onboarding. This, coupled with wider regulatory complexity, has meant no-one has developed a trading platform to enable UK companies to tap into these investors. We intend to address these issues and open up this market through the development of a multi-jurisdictional trading platform and a world-leading onboarding process that utilises biometric technology, AI augmented background checks, Optical Character Recognition of ID documentation, and physical liveness and likeness checking to ensure both new customer and ongoing KYC compliance checks, regulatory reporting and investing can be done as seamlessly as possible.

Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

Total available funding is £25 million across Stream 1 and 2.

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
TISICS LIMITED	DIGITISATION AND OPTIMISATION OF UK METAL COMPOSITE FIBRE FOR IMPROVED ECONOMICS	£284,564	£199,195

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

Fibre reinforced Metal Matrix Composites have extensive applications in high growth industrial sectors such as space and aerospace, key to the UK's economic growth and industrial strategy for exports. These lightweight materials offer 30% weight savings in direct replacement parts and up to 70% weight saving where system designs can be optimised. The UK has a strong history in the technology and the core supply chain from raw materials to final products.

TISICS is the only integrated fibre and metal composite manufacturer worldwide and has extensive experience in developing component and process technologies for a wide range of applications including:

* Aero-engines: Lighter, higher operating temperature components reduce fuel burn.
* Aircraft landing gear: Lighter, higher stiffness gear reduces fuel burn and titanium composites offer an alternative to chrome or cadmium plated steels.
* Satellite pressure vessel: lighter, near net shape propellant and pressurant tanks reduce system mass and half lead time which will be advantageous for constellation satellites.
* Space robotics and structures: Lighter, more compact systems are key to space exploration and in-space servicing.
* Energy: Lighter, more robust steam turbines will increase energy generation efficiency, reducing emissions.
* Automotive: longer term high production volume economics will allow MMCs to offer lighter systems capable of reducing emissions from combustion engines or range extension for electric vehicles.

This project builds on the previous work aimed at the development of a world leading silicon carbide fibre production facility for MMCs. In order to industrialise this technology further development is needed to bring manufacturing maturity and production economics, of which the reinforcing silicon carbide fibre is a significant factor, to the necessary level for inclusion in space and aerospace platform designs.

To address this TISICS development strategy for its fibre (since completing its development in 2014) has involved some initial process automation and digitisation and improving reactor component designs. The next steps to be addressed in this project are for:

* further process digitisation for real time process monitoring and diagnostics. Achieving a more economic process and blueprint for a larger facility by extending the use of digital sensors for process control and in-process monitoring to lead to reliability gains in start-up and to extend batch production output
* improved feedstock supply control and conversion rates via modelling and redesigning the feedstock supply, capture and recycle systems
* modelling and designing waste management solutions. This project will address the major costs influences.

Results of Competition: Innovate UK Smart Grants: July 2019

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PHUTURE PHUTURE LTD	HOOKSLAM MAKING HITS WITH AI	£176,125	£123,288
Queen Mary University of London		£74,710	£74,710

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
In recent years, the way hit records are made has fundamentally changed. A typical chart Number One these days may have a beat from one writer, a hook from another and a vocal from someone else to create just a few bars of a final song. A recent survey from Music Week stated that the average number of writers for hit records in the charts is 4.58 with Mark Ronson's global hit 'Uptown Funk' being credited to 13 different writers! This sense of collaboration and diversity has meshed with music-making and consuming habits to create a 'producer culture' of digitally-enabled maestros marshalling an ever-evolving roster of singers, rappers and instrumentalists to work together on different compositions. But, whilst making music is easier than ever, the route to the charts is arguably harder. The biggest problem facing musicians, vocalists and producers is connecting with other possible collaborators and publishers. There are plenty of digital destinations for the results of their labour, but very few places for music creators to source a regular stream of these all-important new collaborators. Hookslam will enable this paradigm shift in humankind's favourite form of cultural expression. Our own unique British-made AI technologies and software will sonically identify musical matches and connect musicians with their ideal cohorts to find the most suitable, and effective, creative partnerships. From these matches, it will ultimately deliver a produced piece of music with publishable rights and share the co-owned royalties from sub-publishing deals. The project brings together a World Class team in Ai , Music Analysis, music production, sound design, app design and development. We have, within our gift, the ability to take the project from concept to MVP.

Results of Competition: Innovate UK Smart Grants: July 2019

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
METABOARDS LIMITED	Large-area wireless charging enabled by metamaterials: integration of the novel technology into existing wireless-power infrastructure	£477,878	£334,515

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 is a feasibility study into adapting Metaboards' metamaterial technology for powering and charging multiple mobile smartphone devices and accessories anywhere on a large charging surface using the recently and widely-adopted Wireless Power Consortium (Qi) standard. The main outcome of this project is a technology that can be integrated into market-ready products. This project will enable Metaboards to grow its product portfolio in a cost-effective way that will allow us to address new market segments and customers. Wireless charging today is limited to close alignment between power source and receiver. The adoption of wireless is slow due to poor user experience: to the user, this is not a significant step away from existing wired charging. Freedom of alignment would enhance the adoption of wireless charging among users. Metaboards' technology will address the need for large area, flexible and scalable wireless power solutions, where energy can be routed to the receiver devices without the need for alignment. This allows us to create more flexible and functional wireless power solutions. Metaboards' proprietary technology can be used in many different environments, including home, office and public spaces. Metaboards Ltd is a UK start-up, founded on the principle of using metamaterials technologies in commercial applications. With our expertise in metamaterials and electrical and electronic engineering and relevant business experience, we can deliver a game-changing technology for wireless power transfer and drive its adoption to a wide market within the consumer electronics sector.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ANZEN TECHNOLOGY SYSTEMS LIMITED	AnzenDB - A next generation high security cloud database.	£275,361	£192,753

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
Background/Opportunity Organisations and governments are looking to the cloud to benefit from: * Only paying for the storage they use, reducing infrastructure costs. * Continuity of operations and easy disaster recovery. * Accessing resources and applications cost-effectively. * Cutting energy consumption, reducing environmental impact. However, new GDPR regulations require companies to ensure data sovereignty for EU citizens and data breaches are an acute problem. The DCMS commissioned "Cyber Security Breaches Survey 2019" showed 60% of medium and large UK businesses experienced breaches in 2018/19\. IBM research shows an average cost of £3m/breach (£140/record). Current DBaaS state-of-the-art does not even consider data sovereignty and jurisdictional compliance, relying instead on traditional security measures. Inspired by these opportunities, Anzen Technology Systems (ATS) has developed Anzen technology. This new approach to security introduces the concept of 'obfuscation' - "clustering" data so that it can be broken into shards for storage in separate locations, both on the cloud and locally. Our patented process renders the contents of each shard meaningless, requiring an attacker to obtain all shards simultaneously. If a breach was suspected, the user can simply re-run the process, rendering any stolen components useless. We have already shown proof-of-concept for a static storage solution. In this project we will develop a Database-as-a-Service (DBaaS). By incorporating Anzen technology we provide a last-line-of-defence, additive to both the security and DBaaS markets.

Results of Competition: Innovate UK Smart Grants: July 2019

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CYCLOPIC LTD	Electric Drive-system	£183,759	£128,631
PRODUCTIV LIMITED		£227,736	£159,415

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
The project involves the development and production of a drive system that enhances and operates with a centreless wheel. This highly integrated system has many applications and will be used for an electric concept vehicle. This will enhance zero carbon emissions and produce a more affordable e-concept car. It will produce a zero-emissions vehicle that will have unique benefits:- Height adjusting wheel that can range from ground 0 point to highest point of ground clearance - 4x4\. As the steering, suspension etc is in the drive system unit the electric vehicle will not have an axle therefore the car can provide the highest point of ground clearance. The height adjustment aids mobility and disabled users. easy-load for the boot etc. The electric centreless wheels provide unique vehicle design and improved aerodynamics. The electric drive system is very suited for SMART/Autonomous vehicles. The 4 wheel drive-systems will operate the E-Concept vehicle and provide manoeuvrability that produces 360 degree wheel function which provides parallel parking. Ideal for parking in small spaces creating possibility for space-saving parking zones - eg. beneficial for urban/city living. Due to road-reading technology now available the drive-system, operating the centreless wheels, can adjust height whilst in motion therefore providing a vehicle levelling at all times. Benefits include possibility of a ditch-safety system as the vehicle can lower to 0 ground position, this would be a beneficial feature for autonomous vehicles also. 0 ground position is an excellent position for induction charging. Therefore this gives the possibility of home-charging and more effective charging points in urban/city zone. Huge Market potential significant UK and overseas market for this product. EV manufacturing is 3rd biggest market. 11 key players including Volkswagen Group, Nissan Group & Jaguar Land Rover. EVs are currently sold in 60 countries, with most sales (1.65%) in developed countries including China. \>2 million EVs were sold in 2018\. Market Sizes: We estimate the total global addressable market to be £13.76B (2.1M EVs sold pa * £32,000 estimated license value). Post-commercialisation, we expect to be able to capture 2% TAM within 5 years (£36M pa). This project meets Govt priorities Re:- electric cars and achieving zero carbon - the Grand Challenges contributing to becoming a world leader in shaping future mobility and tapping into revolutionary electric transport The UK Government has outlined its commitment to support EV production and R&D within ISCF which this project will help to address this.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
LIGHTPOINT MEDICAL LTD	Developing a prototype of a miniaturised electron cancer detection probe for robotic surgery	£499,845	£349,892

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
Prostate cancer is the most common cancer among men with 12,000 men in the UK dying from the disease every year. 130 new cases of prostate cancer are diagnosed every day. Over the past 30 years, incidence of the disease has soared by over 40% with further increases predicted to 2035\. Surgery remains the primary treatment option for prostate cancer but is very often unsuccessful, largely due to the incomplete removal of cancerous tissue during an operation. In particular, cancerous cells around the primary tumour and lymph node metastases can be frequently missed during surgery. Surgeons often fail to remove all the cancer because there is no way to accurately detect cancer during surgery. They are completely dependent on their naked eye and sense of touch to identify all cancerous tissue. With the move towards minimally invasive, robotic surgery, surgeons are increasingly losing even their ability to use their sense of touch. Numerous technologies have attempted to address the pressing medical need to find cancer during surgery, but none have proven sufficiently accurate and cost-effective. Lightpoint Medical has developed an _in-vivo_ probe to detect prostate cancer intra-operatively. The device detects electron signals from an imaging agent administered to the patient prior to surgery which concentrates in cancerous cells. The electron signal has a small penetrative depth and therefore can accurately guide surgeons to any remaining cancerous tissues surrounding the tumour site, providing such precision to ensure the full removal of cancer and enable, where possible, the retention of healthy, functional tissue. The technology promises a complete transformation of outcomes for prostate cancer patients. Proof-of-concept for the probe has been achieved with a highly innovative and sophisticated data processing algorithm to ensure a clear signal from electron emissions to the exclusion of the background gamma signals. This project is a 12-month work programme to miniaturise the technology to a scale compatible with contemporary keyhole, robotic surgery. The outcome of the project will be a working prototype ready for pre-clinical validation.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
WORKFLOW MANAGEMENT LIMITED	Re-flow - Enhanced Field Workforce Management through implementing biometrics, AI and workflow productivity enhancements	£349,435	£244,604

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
Workforce Management Limited is seeking to digitally transform field-based management within the construction sector, through the development of a world-first, end-to-end workforce management platform for field-based employees, Re-flow. The company comprises a team of experienced and knowledgeable software developers, focused on creating transformative workforce management solutions for businesses. By utilising cutting-edge techniques in Machine-Learning, Sentiment Analysis and Biometrics, Re-flow will answer the field-based challenges currently encountered within the construction industry, effectively addressing employee productivity, project management, health & safety, compliance, training and security.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MEDIDATA EXCHANGE LIMITED	My Health Wallet (MHW) - A Patient Centric Mobile Application To Securely Hold and Transmit Medical Data.	£370,157	£259,110

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
MediData is a healthtech software company developing simple to use, highly secure applications for GP practices and patients to exchange medical data. Through the company's flagship proprietary software (eMR), the GP practice can produce in minutes (with explicit patient consent) a suitably 'redacted' medical record and copy of the entire patient record, which can be transmitted to any 3rd party outside the NHS, authorised by the patient using 2 factor authentication security. MediData now aim to develop their technology into a fully interactive MHW, which will hold a copy of the patient's 'FULL' medical record in an easy-to-navigate structured format with write back and transmission-controlled features. Underpinning the project are two significant healthcare challenges: 1. GP's are becoming increasingly overwhelmed by GDPR requirements for data handling and requests for patient medical record from 3rd parties e.g. insurance companies. Estimates suggest UK GP surgeries receive ~3m SAR instructions p.a. The MHW and eMR integrated platform will provide a 300% faster turnaround of redacted medical record compliant under GDPR and data Protection Act whilst reducing back-office costs by ~70%. 2. In 2017, the Institute for Public Policy Research reported levels of mental illness and distress, and low wellbeing among UK Higher Education (HE) students are increasing and are high relative to other sections of the population. MHW will provide students with the first cost-free patient centric health wallet with access to real-time data monitoring performance, in tandem supporting universities with addressing newly implemented governmental policy. MHW will allow users to control who sees their medical data and with appropriate consent. 3rd parties are granted access by the patient to manage their health and wellbeing. Information, such as treatments, test results and interventions can be stored within the app, using a universal clinical code used by all GP practices across the UK. This allows the user to push data back to their GP practice (collected from clinical facilities or hospitals outside the NHS or the UK) or create 'redacted' records for authorised 3rd parties to receive. MediData will bring MHW to market by 6 months of the end of this project (July 2021) and forecast a cumulative revenue of £10.56m for the first 5 years of sales, generating an EBITDA of £6.65m (ROI of +12:1). This would see the company add +100 highly skilled jobs to its headcount in technical, sales and management positions.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ORTHOSERVE LIMITED	StemX v.3- uncemented hip prosthesis hip extraction system	£148,800	£66,960

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
Total Hip Replacement (THR) also known as Total Hip Arthroplasty (THA) is the second most common joint replacement procedure undertaken globally. It is done either using antibiotic bone cement or un-cemented "press fit" hip stems. Over the last 20 years there has been a steady move away from cemented THR due to increasing revision rates. As a consequence the majority of procedures in the UK, Europe & USA now use un-cemented THR stems. Whilst methods of revision of cemented hip stems have been developed to enable the breakdown of bone cement for ease of removal of the cement THR stem therefore reducing the need for Extensive Trochanteric Osteotomy (ETO). This is still necessary for most un-cemented THR revisions. As ETO is a highly invasive procedure with extensive soft tissue, muscle & bone loss with a procedure time of up to 4 hours & a cost of 5-10 times primary THR, an effective means of safe, quick & cost effective removal would provide significant benefits for the patient & the healthcare provider. Orthoserve Ltd, a unique medical device company aims to provide a novel solution for primary uncemented THR revision, without the need for a sagittal osteotomy and bone removal.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
KORN WALL LIMITED	Development of a sustainable Patient Privacy Screens for the NHS to replace Hospital Curtains (PatientScreen)	£382,714	£267,900
CRISTEX LIMITED		£83,117	£58,182
University College London Hospitals		£29,761	£0

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
The NHS use curtains in wards to provide patient privacy e.g. during administration of medicine/treatment/consultation. Collectively they use ~500,000 such curtains in a market worth £150m p.a. which is segmented as: (i) 90% "disposable" polypropylene antimicrobial fabric (replaced every 3-6 months or when contaminated) and (ii) 10% "washable" polyester fabric. The NHS has a policy to phase-out "washables" driven by cost reduction, reducing infection incidents from poor washing processes, and reducing the environmental impact from use of detergents. However, "disposables**"** create biohazard risks and are sent to landfill or incinerated. We will create, for the first time, an innovative Patient Privacy Screen (PatientScreen) to replace hospital curtains. They will be cost competitive and will radically improve NHS sustainability.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
KAGENOVA LIMITED	Unlocking 360° Virtual Reality (VR) by Spherical Deep Learning	£400,033	£280,023

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
Today's virtual reality (VR) experiences provide either photo-realism or interactivity --- but not both at the same time. VR experiences based on 360° video content are photo-realistic since they are based on photography. However, these experiences are not interactive since they are based on footage from a camera at a given position and hence the user cannot move about in the virtual scene. Alternative VR experiences based on computer generated imagery (CGI) do provide interactivity but are usually far from photo-realistic. In this project Kagenova is developing core technology to provide photo-realism and interactivity at the same time and at scale. To achieve this elevated level of realism and immersion, we are developing novel deep learning techniques for spherical data, such as 360° photos and videos. Our technology allows users to walk into 360° VR video and move about in the scene. We turn 360° video content into explorable virtual worlds, thereby democratising VR content creation so that life-like immersive content can be created by anyone with a cheap, consumer-grade 360° camera.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CLEAN POWER HYDROGEN GROUP LIMITED	Clean hydrogen production by non-membrane electrolysis	£483,686	£338,580

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
Hydrogen as energy generates zero carbon emission at point of use. When produced by electrolysis from renewable sources, there is also zero carbon emission in production. Uptake of hydrogen-based solutions supports the UK's commitment to cut CO2 emissions by 80% by 2050 and there is tremendous potential for hydrogen as an energy carrier and energy store. There is a wide range of emerging applications for hydrogen, namely decarbonising of heat, powering fuel cells to displace combustion engines in transport and non-road machinery, and in electricity storage. Replacing conventional fuels in these sectors also delivers emissions and noise reductions to improve the local environment, especially air quality. More than 95% of global hydrogen production is by steam methane reformation. This is largely a centralist activity in industrial plants and in general the carbon dioxide produced in the process is not captured. Nowadays there is considerable and growing interest in electrolysis for hydrogen production using electricity from non-fossil fuels. Not only is this carbon-free, but also provides an opportunity for scaling of production to meet local demands, thus avoiding long supply chains from production to point of use. Most of the current developments in electrolysers are based on membrane technologies to separate the mixed gases which are produced by electrolysis. Uniquely Clean Power Hydrogen are in the process of developing an innovative non-membrane electrolyser and gas separation system with the potential to deliver market-leading efficiencies and cost competitiveness, at the required levels of purity and with world-class levels of reliability and safety. The non-membrane solution avoids the high initial costs and high maintenance and replacement requirements of membrane-based solutions plus the avoidance of special metals which are characteristically required for Proton Exchange Electrolysers. This project will enable rapid progress to be made in electrolyser technology, improving electrolyser design, safety and design and build processes. The outcome of the work will be a hydrogen production system which will be used to disseminate learning, demonstrate performance and move towards full commercialisation of this innovative technology.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SIMUL SOFTWARE LTD	Cloud Streaming for Virtual Reality	£463,260	£208,467

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
SimulCaster is a network protocol for Cloud VR. Virtual and augmented reality could be a big part of the future economy, but with current technology it is difficult to offer a high quality and low latency immersive experience without access to expensive PC hardware. With its innovative approach to latency, the SimulCaster protocol allows large-scale, high-quality immersive experiences on cheap, lightweight headsets, streamed directly from the Cloud. With immersive content housed in the Cloud and streamed only when needed, access to the spatial internet becomes instantaneous, opening a new universe of possibilities for applications of immersive technology.

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Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

Total available funding is £25 million across Stream 1 and 2.

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
TMN THERAPEUTICS LIMITED	'Degen-lock' - a novel way of protecting the nervous system in Motor Neurone Disease	£464,042	£324,829

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
We are developing a treatment for a neurological disease called motor neuron disease (MND). There is no cure for MND and the current therapies on the market do little to delay disease progression. This condition is caused by the death of a particular subset of brain cells known as motor neurons. These cells normally instruct muscles when to move, and their death causes patients to experience a progressive and irreversible paralysis. As the disease advances many patients find it difficult to talk, swallow and breathe, putting them at risk of choking or respiratory failure. Over 80% of patients will not survive 5 years after diagnosis. One of the reasons brain cells die in MND is chronic inflammation in the brain. Some inflammation can be a good thing-- it kills viruses and bacteria and helps to remove debris and dead cells. However, when this inflammation gets out of control it can kill brain cells, accelerating the progression of MND. To treat MND an extremely strong, but specific, anti-inflammatory is required --protecting motor neurons but allowing the rest of the brain to benefit from positive effects of inflammation. We have therefore invented a new technology, 'degen-lock' which targets an anti-inflammatory effect to the brain cells which are dying in MND, protecting them from inflammation. This grant from innovate UK will allow us to test and develop the targeting system and create a prototype of our MND therapy.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CONTENT CATALYST LIMITED	Maci-D: An AI-powered tool to accelerate the identification and extraction of business intelligence data	£358,815	£251,170

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 an age where data is generated continuously in large amounts, identifying relevant data has become equal to finding a needle in a haystack. Consultancies and research firms support decisions made by businesses worldwide. They now face a significant challenge to manage data reports, to find the source of data or even to re-use processed data. This impacts the productivity of analysts, and the companies they support miss on opportunities. To address this challenge, Content Catalyst, a software development company for business intelligence publishing, has identified an opportunity to create a unique solution that allows the identification and extraction of data from within reports generated by analysts. This solution will retain all descriptive information allowing businesses to access data from within reports of interest at the right time, knowing exactly where it came from, who generated it and when. Project Maci-D focuses on investigating the integration of various advanced computational technologies to develop a functional prototype that enables users to identify and extract data from within data reports. The solution generated in the project will allow business intelligence data to be more accessible and manageable, thus enhancing its re-use. The retention of descriptive information will motivate end-users (businesses in the UK/Worldwide generating or consuming research reports) to adopt better practices such as referencing, allowing trust to be regained in their decisions.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PATTERN PROJECT LTD	PATTERN PROJECT	£129,520	£90,664

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
Pattern Project will re-imagine UK's relationship with clothing. We will make well designed, custom-fit, contemporary garments made from high quality fabrics are affordable to many people, not just the few. Our aim is to increase functional and emotional durability of clothing. We will harness the UK's talent in user experience, software development & technical fashion design to produce digitally-aided bespoke garments. Our Project has three focus areas: * Product Innovation \> Design of PP Ready-to-assemble clothing & the learning experience. We will be developing and testing augmented reality learning filters and sew along videos. _Contact us if you are interested in testing our first product._ * Service Innovation \> Design of mixed-use high street factory/community space with consideration for wellbeing and health and safety of customers, employees, franchise owners and neighbourhood. We will focus on balancing manufacturing & community space. _Contact us if you are interested in being part of our social space testing._ * Technological Innovation \> Design & develop back-end platform including proprietary layout optimisation algorithms & automation scripts for seamless integration between website front-end & laser cutting machine software. Our application has been supported by Future Fashion Factory, which is part of the Creative Industries Cluster Programme, funded by the [Arts & Humanities Research Council][0] and part of the [Industrial Strategy][1]. [0]: https://ahrc.ukri.org/ [1]: https://www.gov.uk/government/topical-events/the-uks-industrial-strategy

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
IOTECH SYSTEMS LIMITED	Software Defined Automation Platform (SDAP) - revised	£499,471	£349,630

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 Internet of Things (IoT) is the inter-networking of physical devices, vehicles, buildings, and other information sources embedded with electronics, software sensors, actuators and network connectivity which enable these objects to collect and exchange data. Together with the intelligent services to allow them to process information of the physical and the virtual world and react, this forms one of the new technological phenomena driving the current digital revolution.

A major need is to have a robust, real time solution for time critical industrial monitoring and control applications. This follows the need to provide individual devices with the ability to operate remotely controlling vital processes, and collate data from many devices feeding big data analytics for predictive decision making. This is the Industrial IoT (IIoT).

For several reasons, currently installed (industrial) control systems are predominantly closed and proprietary. This contrasts to the open, interoperable network of instrumentation devices below them and the Information Technology (IT) systems above in the typical automation hierarchy.

Closed, proprietary systems are expensive to upgrade and maintain, and challenging when trying to insert new technology, especially from third parties. (Source: The Open Process Automation(tm) Business Guide).

By providing software defined solutions running on commodity hardware, capable of remote updates to an entire estate, these issues are addressed offering costs savings and long-term confidence of supply.

This project will deliver:

•A flexible open solution supporting virtualized workloads for time-critical applications

•A simplified "Supervisory Control and Data Acquisition" (SCADA) integration.

•Support a range of time-critical use cases including closed loop control, industrial data inference, and virtualized PLC applications

•Extensible containerized provisioning enabling a deployed system to evolve as additional applications are deployed

•A solution that can use the latest Intel and ARM ultra-low power System-On-a Chip (SOC) processors

Our objective is an implementation independent of silicon, operating system, hardware and application provider; the solution will run stand alone on highly embedded devices or be delivered in conjunction with other Edge based systems. The initial reference implementations are an extension to the Linux Foundation's EdgeX open IoT Edge Platform, but ultimately the solution could provide time-critical extensions to other Edge Platforms e.g. AWS Greengrass

EdgeX is a vendor-neutral open source project building a common open framework for Industrial IoT (IIoT), edge computing. EdgeX is seeing wide scale

adoption and broad industry support, it provides an excellent reference platform on which the output of this project can be validated.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
HUMMINGBIRD TECHNOLOGIES LIMITED	Variable Rate Applications for Agrochemical Inputs per Head of Lettuce	£498,827	£349,179

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

Lettuce growers currently make 7 to 8 'interventions' in the course of a crop life-cycle listed below;

* Soil testing / Base nutrient (N,P,K) application
* Planting - Phosphorous (P) application
* Irrigation - 2/3 times in the first 10 days
* Weeding and nitrogen (N) application at 3 weeks
* Weekly pass with prophylactic pesticide, 6 to 7 applications in total
* Secondary fertiliser application
* Harvest
* Post-harvest herbicide application

For each intervention, Hummingbird will collect and analyse data and subsequently conduct trials to build models that can help growers target their interventions more effectively, efficiently and profitably. The ultimate aim for this project is to allow growers to achieve data driven variable rate applications per individual plant based on the plant's needs.

Each area is highlighted below:

Base Application: _Soil_

1. Field History: Field shapefiles, Digital Elevation Models (DEM), previous crops, and soil quality reports. This will form the 'Evidence' used to determine the current quality of the field.
2. Application Model: taking field history and crop type as inputs, determining the nutrient requirements of the field in an idealised application.
3. Instruction Generation: considering physical constraints (farm machinery used, fertiliser available, etc) converting the ideal application into a variable rate instruction map.

Plant Applications: _Irrigation, nitrogen & pesticides_

1. Sizing & counting maps: NDVI from remote sensed imagery will be combined with elevation maps, soil and weather data to generate the idealised application. Data on the crop performance and response to the first application will then be used to inform the subsequent applications.
2. Application Model: Using the results from step 1 - determining the nutrient requirements of the field in an idealised application.
3. Instruction Generation: considering physical constraints (farm machinery used, fertiliser available) and converting the ideal application into a variable rate instruction map.

Pesticides: Disease resistant varieties are currently given unnecessary pesticide applications as they are planted in the field with non-resistant varieties. Shapefile application maps based on variety type will target these applications where needed.

Harvest: Most yield loss occurs at harvest due to plants that are either too small/big. Base & Plant Applications will aim to reduce this variability but continuations of the sizing & counting maps will direct the harvest rig to areas of the field that, due to their size, will be ready first then onto the next zone.

Post-harvest Herbicide: Vary rates according to; harvested crops, residual crops and weeds thereby reducing chemical overspray, potential runoff and environmental impact.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VIRTUAL ARTS LIMITED	Machine learning for immersive content performance improvement	£248,191	£173,734

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 is about delivering innovative software technology for immersive experiences and applications such as virtual and augmented reality on mobile devices such as smartphones, tablets, all-in-one mobile VR headsets and mixed reality smart glasses. The technical challenge is a paradox: on the one hand, creating immersive experiences requires heavy-duty computing resources which are power hungry. On the other hand, the battery of a mobile devices can deliver much less power than a desktop computer has access to. Unlike existing software engine developers, who have added support for virtual reality to existing software engines, which were either originally designed for desktop computers or for much earlier generations of smartphones, we have built our software engine with a focus on virtual reality and augmented for mobile devices from the outset. This means we are already market leaders in low power consumption. In this project we want to go even further. We know that modern processors contain a variety of different types of processing units, each of them with different performance characteristics. Some of them are very fast but power-hungry, while others are slower and power efficient. We also know that different aspects of virtual reality and augmented reality content need to run different processes in different ways, for example for graphics rendering or for computer vision. We think that we can develop a much better way of managing the allocation of processing resources to immersive content workloads, to ensure that each routine runs on the most suitable processing unit, thus improving efficiency and reducing power needs. We are going to utilise artificial intelligence (AI) and for instance machine learning (ML) to monitor the processing chip while the software engine is running, to analyse the processing needs of each software routine, and to allocate each routine to the most appropriate processing unit. This would lead to significant performance improvements and power consumption reduction. This unique use of AI and for instance ML would enable faster and better immersive experiences and applications, and we would license our AI and ML powered software engine to other developers of immersive content, for the maximum benefit to all users.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
NATURBEADS LTD	Biodegradable cellulose microbeads for high-volume applications	£405,988	£284,192

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
Plastic microbeads have risen to the headlines following bans in UK, US, Canada and other countries, for their use in rinse-off cosmetic products. These bans are good news for consumers and the environment, with more and more evidence of the presence of plastic beads in humans, plants, animals and as far away as the Arctic. However, the bans have given the public the false perception that the problem of microplastic pollution has been solved. This is far from being true: first, microbeads are still used in leave-on cosmetic products, e.g. make-up and sun cream and second, and more importantly, plastic microbeads are used in much larger quantities in paints and coatings, oil and gas fluids, agriculture and construction. Although, in these applications, microbeads might have a longer working life than in a shower gel, they also end up in the environment, contributing to microplastic pollution in waterways, soil and air. Naturbeads has developed the expertise to manufacture cellulose microbeads ranging in size from 1 micrometre to \>1mm and is scaling-up the production of small microbeads for the cosmetic industry (1-100 micrometres). Cellulose is a natural material, renewable and biodegradable. Thanks to its chemical stability it has the potential to replace microplastics where other alternatives fail because of operating conditions including high temperature, pressure or due to corrosive solvents. The beads' spherical shape mimics the rheological properties of plastic microbeads in a way that fibres cannot. A 2019 report from the European Chemical Agency (ECHA) proposed an extension of the plastic microbeads ban to large volume applications beyond cosmetics (detergents, paints and coatings, horticulture and agriculture, oil & gas, construction materials, and medicinal products). Naturbeads is well positioned to provide biodegradable cellulose beads as alternative to plastic microbeads in these applications. In this industrial project, Naturbeads will demonstrate a manufacturing solution for the production of cellulose beads with dimension \>100 micrometres, to address the needs for plastic microbead replacements in industries affected by the proposed ECHA bans. This new product line works on a streamlined process to produce beads at higher volumes and lower costs than those for the cosmetics industry. The larger microbeads produced in this project will be tested in different end-users products, starting with construction, consumers products, and oil and gas applications. The project will serve as a proof-of-value of the production process and allow testing of the performance of the beads in end-users' products.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
HOLOME TECHNOLOGIES LIMITED	HoloMe: An advanced immersive telepresence solution utilising AR for B2B communications	£314,396	£220,077
CISCO INTERNATIONAL LIMITED		£50,517	£25,258
University College London		£131,648	£131,648

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
As a communications tool, Augmented Reality (AR) offers the potential to bring the immediacy of face to face conversation to the convenience of telecommunications. But whilst tech giants including Amazon and Microsoft have made significant progress in the use AR and other immersive technologies in e-commerce and supply chain management, little has been achieved in the telecommunications space. One of the main reasons for this is that there are a number of challenges inherent to the facilitation of telecoms conversations between AR humans that remain unsolved. There is currently no widely accessible or affordable immersive technology solution for B2B communications. HoloMe were established in 2017 and are currently engaged with a range of businesses who are trialling the pre-recorded AR platform, including ASOS.com, Warner Music Group, Man City, Esquire, Yoox Net-a-Porter etc. HoloMe's state-of-art Software Development Kit (SDK) is provided to clients free of charge for integration and testing. Once integrated, they are able to convert content from flat video to AR assets using the content conversion tool which delivers revenue to HoloMe HoloMe's aim to become the global leader in the deployment of AR humans over mobile at speed and scale, in both pre-recorded and live form. Eliminating the use of hardware, the company's approach uses the combination of a video file, a unique data-mesh overlay and machine learning. HoloMe's current platform offers the ability to pre-record, process and display high-definition, uni-directional content of humans in AR. Building on this platform, this project would enable HoloMe, to explore the viability of a real-time, bi-directional AR telepresence solution. Project partner Cisco will undergo a full pilot trial, leveraging their expertise and reach in user-centered design and B2B telecoms markets. UCL (academic partner), will research the neural and physiological aspects of this type of communication to quantify the impact of using a live AR communication tool

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
THERMAL RECYCLING (UK) LIMITED	Commercial applications for treated material following denaturing of chrysotile asbestos	£90,143	£63,100

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
Asbestos is a hazardous material the use of which was banned across Europe in 1999\. Asbestos still accounts for about 5,000 deaths a year in the UK. Currently all asbestos that is removed from buildings around the world is disposed of in landfill sites. Thermal Recycling has developed a system for denaturing (destroying the properties of) asbestos and using the treated material to create a new product that can be used in the construction industry. We are currently building a demonstration plant which will be commissioned at the end of 2019\. When the demonstration plant is open it will be the first plant in the world that has a commercially viable approach to disposing of asbestos. We aim to have the world's first circular approach to treating asbestos. The final aspect of this is to identify the best use of the treated material. This can only be done when the demonstration plant has been commissioned. We have identified six products that can be made from the treated material. This grant will enable us to identify the product or products that are most technically and commercially suited to production and to get them certified for sale. The grant will pay to develop and produce initial prototype products which will be screened in a laboratory. We will then research the markets for these products and select the ones that are most technically and commercially viable. We will then produce and intensely test a statistically valid sample of these products. Once they have been tested they will be certified and saleable within the chosen markets.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SUSTAINABLE VENTURE DEVELOPMENT PARTNERS LTD	Smart Waste Infrastructure and Forecasting Telematics - pilot trial (SWIFT)	£206,250	£144,375

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
Current methods of waste collection have remained largely unchanged for decades, whereby significant inefficiencies exist in the system, creating unnecessary air pollutants and the congestion of busy urban roads. Smart Waste Infrastructure & Forecasting Telematics (SWIFT) seeks to address these issues through the use of sensors and collection route optimisation. Retrofitting/installing the SWIFT device in bins/skips will also lead to a reduction in the incidence of litter resulting from overflowing bins/skips (improving the amenity of urban areas) and fly tipping. This project seeks to undertake pilot trials, moving the SWIFT concept from TRL 6 to TRL8 with projected market entry 2021\.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PUSHME BIKES LIMITED	Pushpod Elastic Charging (PEC)	£279,785	£195,850

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 shared e-micro-mobility expanded to electric scooters last year, cities around the world began to adapt to and embrace this exciting new approach to personal transportation. With 860,000 vehicles in use today, it is quickly becoming the leading alternative to car sharing or ride hailing to replace short urban car and public transport trips. Increasing infrastructure like widening bike lanes and providing more designated parking aside, these services will however require significant cost reductions to become accessible to a wider customer base. Batteries make up half the capital cost of an e-scooter. Standard fixed-rate charging routines result in taking too long to serve peak demand efficiently and in batteries only having 1000 charge-cycle life. Charging is currently the primary operational cost for e-vehicle rental operators at c.50% of average per-ride-revenues. With this project, we want to triple the battery-life and reduce CAPEX by 30% and OPEX of charging to rental operators by up to 10x by developing the first elastic charging-system for e-micro-mobility vehicles, the Pushpod-Elastic-Charging (PEC). The PEC completes our provisionally patented three-part battery-swapping system. As we increase battery life, reduce cost of recharge, and reduce the number of charging devices required, the cost-per-ride could drop by 50%, below the average fare for public transport. This will incentivise more people to use this energy-efficient transportation, reducing congestion and taking pressure off public transport.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
HILO MARITIME RISK MANAGEMENT LIMITED	HiLo Manufacturer's Feedback Loop	£89,690	£62,783
LLOYD'S REGISTER CONSULTING - ENERGY LIMITED		£38,408	£26,886

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

Safety Data in the Shipping Industry

HiLo is dramatically improving safety for our brothers and sisters working out at sea. In the last 10 years 25,898 people have died or been injured at sea. 42% of casualties are caused by machinery and equipment failure. Based on death rates, shipping was found to be 25 times riskier than aviation \[Berg\].

1,186 ships have been totally lost since 2008; machinery failure is the third most common direct cause. Machinery failures cause further incidents, for example, 65% of total losses result from foundering of which machinery is the third most common cause.

For as long as shipping companies have collected safety data, the maritime industry has wanted to get hold of it. Internal data within companies is gold dust -- it gives the best insights to make the industry safer. Shipping companies keep this data internal, because:

* sharing near misses and accidents can cause huge reputational damage
* awareness of poor safety records reduces the likelihood of vessels being chartered
* they have not been offered a valuable service in return for sharing data.

Many industry bodies are given data on incidents, where the media has become aware or an insurance claim needs to be made. There is no incentive for companies to hand over more information than required.

HiLo has broken down this myth, receiving everyday safety data from over 40 of the industry's biggest shipping companies for each of their 3000 tankers, bulk carriers and container ships. This project led by HiLo will develop the Manufacturer's Feedback Loop, a system which will allow shipping companies to see where poor equipment has cost lives and assets elsewhere in the industry, and give them the tools to prevent incidents. This platform will give subscribers the opportunity to report issues they have seen on board without the risk of penalisation by Classification Societies, and through HiLo, join forces to make real changes to safety levels across the maritime industry.

Instead of individual equipment failures, the Manufacturer's Feedback Loop will be able to see trends across companies and across time. This will give the industry unprecedented power to address safety issues at their root.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CYANETICS LTD.	Creating sustainable biopolymers from mixed plastic waste pollution	£233,212	£163,248
University of Nottingham		£96,698	£96,698

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
Plastic usage will double by 2036, yet \>70% is unrecyclable and \>94% is still produced from virgin hydrocarbons. Despite growing social momentum for a plastics circular economy, re-processing of mixed plastic waste (MPW) is extremely challenging. Waste-to-energy (W2E) technology offers a stepping stone technology, extracting value from MPW but at high environmental cost (CO2 production) and is a fundamentally open-loop process (low on the waste hierarchy). Cyanetics will engineer a new strain of cyanobacteria to fixate CO2 from waste exhaust gas arising from MPW processing to create industrially valuable, sustainable, plastics alternative materials. CO2 production arising from both stop-gap W2E technologies and emergent chemical recycling represents an open loop loss to a plastics circular economy model. We will design process technology based on this strain which will harvest this waste gas, returning it to the plastics value chain (to chemical manufactures) as a sustainably produced bio-plastics (PLA-precursor) which is both bio-degradable and recyclable (by the produced process).

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
APEXX FINTECH LIMITED	APEXX Intelligent Routing Payment Cloud (AIRPC)	£499,820	£224,919

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
Regulatory pressure increases innovation and competition in the UK Fintech sector regarding payments infrastructure, however, merchants have difficulty understanding payment technology. Despite emerging ways of paying, e-commerce transactions today remain static, with little opportunity for the merchant to switch to a better acquirer due to high initial setup costs and complex technical integration, APEXX FINTECH LIMITED will develop a disruptive cloud base payment solution which will be the first one to: 1-Allow merchants to increase reliability and optimise returns through an intelligent transaction routing technology. 2-Reduce transaction fees and improve conversion by offering an agnostic platform to access various payment providers (i.e. Acquirers) increasing competition and pricing transparency. 3-Provide better insight and management of their cash flow with consolidated reconciliation and settlement. APEXX will develop and demonstrate a pre-production prototype across 5 key pilot industries to validate its performance.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
REFINERYY LTD	Loan and Asset State Machines for Asset Backed financing	£296,639	£88,992
TURING INTELLIGENCE TECHNOLOGY LIMITED		£84,000	£25,200
University College London		£112,116	£112,116

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Project description - provided by applicants
This project will enable us to help digitise the loan market in Commercial Real Estate (CRE) finance, and bring significant efficiencies for the many parties involved. CRE plays an important role in the overall UK economy, representing some 10% of national wealth as at the end of 2015 (source: The Size and Structure of the UK Property Market End-2015 Update, IPF 2016), but despite the size of the market, the process of lending against secured assets is slow, complex and costly. This is because it relies heavily on analogue data from cumbersome and complicated paper loan contracts, and this information needs to be accessed by upwards of 10 parties throughout the lifetime of a loan. Currently, everyone maintains their own version of data in their own separate technologies, and this is costly and inefficient. Our vision is to create digital versions of both the loan and underlying asset data using blockchain technology, and allow everyone to access this one trusted version of data from one platform, including the regulator. The loans would be regulatory compliant, so could be traded more efficiently too. No such system exists within CRE, or any of the other 'Real Asset' classes like Infrastructure, shipping, and Aircraft. In this project Refineryy Ltd, UCL's Centre for Blockchain Technology and Turing Intelligence Technologies Ltd will work on two specific areas that will allow us to deliver this to CRE lenders. Firstly, we will expand on the work we already did in our first prototype to create a robust version of the blockchain enabled digital loan that is fit for purpose. We will also create a blockchain representation of the asset data associated with the loan, so that the asset can be priced effectively and accurately. Secondly, we will train our software models to become better at extracting the information we need from CRE loan documents so that we can create a digital version of them more quickly, and without the need for human interpretation. In addition, UCL will investigate the potential of the overall business model, and of a DLT-enabled technology platform to meet a challenge identified by the Real Estate industry itself: to provide a centralised database of all CRE loans written in the UK. We will demonstrate this work in a series of industry pilots that have been confirmed with leading players in the CRE industry, scheduled to occur in 2020\.

Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

Total available funding is £25 million across Stream 1 and 2.

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
OPTCEUTICS LIMITED	Fast-tracking the development of intraocular medicines	£499,992	£349,994

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
Loss of vision has a huge impact on patients/caregivers. Antibody/protein-based medicines have completely transformed the treatment of age-related macular degeneration (AMD) during the last 2 decades. Patients had few treatment options before the advent of antibody-based medicines against vascular endothelial growth factor (VEGF) to treat AMD. More blinding conditions are now treated with these medicines. Many of these conditions are chronic, so they require intravitreal injections about once every two months directly into the back of the eye over a long period of time. Intravitreal injections are required to achieve a reproducible dose needed for clinical benefit. While there has been tremendous benefit, treatment burden for the patient is high and benefits do not translate in practice after the first year as patients often reduce their treatment over time. The current frequency of injections by an increasingly large ageing population is expensive for the NHS. The **key unmet medical need** is to reduce the frequency of intravitreal injections. The development of longer acting protein-based medicines using animals is severely limited because animals reject human proteins and animal eyes are so different from human eyes (anatomy/aqueous outflow/immune response). **Optceutics has developed the PK-Eye** which models the human eye and is being used to develop longer-acting intraocular medicines to reduce the frequency of intravitreal injections. The eye comprises two cavities, the back (posterior) and front (anterior), which are separated by the lens and iris. The cornea (anterior cavity) and lens are transparent with an absence of blood vasculature, so we can see. Aqueous outflow nourishes the cornea and lens and is the main mass transfer mechanism in the eye. The PK-Eye is a two compartment human scale model of the eye that accurately mimics the aqueous outflow that controls the clearance of medicines after intravitreal injection from the posterior cavity. Use of the PK-Eye accelerates the preclinical optimisation of intraocular medicines. To **increase the commercial footprint of Optceutics** to develop new therapies in partnership with biotech and pharmaceutical companies, the PK-Eye will be scaled and automated so a large number of experiments can be conducted simultaneously to optimise preclinical candidates. The PK-Eye will be modified to also measure the bioavailability of medicines in the posterior cavity that originate from anterior chamber through the use of eyedrops. These enhancements will allow the development of longer-acting medicines and combination therapies that will lead to a reduction in intravitreal injections required for each patient.

Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

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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
OXFORD HEALTHTECH LTD.	Wearable Compression Sensor for Medical Applications - ComSense	£198,978	£139,285

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
Compression therapy (CT) via an elasticated compression garment (CG), is widely used for the treatment and management of venous deficiencies which cause venous leg ulcers (VLU) and in assisting the movement and removal of trapped fluid in the body's lymphatic system which causes lymphoedema. VLU and lymphoedema are long-term chronic medical conditions. It can take months and sometimes years to heal. Over 400,000 people in the UK suffer from lymphoedema and more than 300,000 people are affected by venous leg ulcers. VLU and lymphoedema conditions pose considerable human and social complications, causing physical discomfort, economic burden (loss of/time off work) and loss of self-confidence. Associated psychological effects including distress, depression and anxiety are immeasurable. The cost to the NHS for treating VLU and lymphoedema exceeds £2 billion and £0.5 billion pa respectively. Compression therapy is a critical treatment & management procedure for VLU and lymphedema. It involves the application of a pressure on the affected region of the body (usually the arm and/or leg). It is important to know the amount of pressure being applied at the skin-garment interface - this has consequence on healing. However, currently there is no technology available which can accurately measure the interface pressure. Oxford Healthtech Ltd., is developing a novel technology which will allow the accurate measurement of compression pressure and record data. This is expected to improve healing times and also help clinicians and carers to make well informed decisions.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AI EXCHANGE LTD	Using AI and Natural Language Processing to Enable Instantaneous Transactions of Commodities, Assets and Securities	£499,048	£289,448

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
Unlike trading in listed stocks/shares, transacted through centralised exchanges& for which the buy/sell prices are transparen& changes in price are instantaneously communicated and e concluded in real-time, the global market for trading in illiquid assets such as derivatives, credit products, cryptocurrencies& structured securities (annual_trading_volume $24 trillion(2017)) is an Over-the-Counter(OTC) market reliant on a few Inter-Dealer Brokers (IDB) to price an asset the holder wants to buy/sell, and to identify counterparties to complete the trade. IDBs play a role in trades made through centralised exchanges- when a trader wants to sell large volume, if placed on the market as a single transaction, trading algorithms create a significant drop in the price of the asset, lowering the value realisable. The need to trade through the oligopoly of IDBs creates inefficiencies and costs- IDB fees in 2017=$10billion. **Solution** (SeeQ2) Utilising Natural_Language_Processing(NLP), cognitive reasoning& Artificial Intelligence(AI) AiX, are developing an integrated SaaS technology delivering the full broker process, removing need for human brokers, greatly speeding transaction processes, removing errors, reducing costs of market-making. **Impacts:** 1.Enable multiple simultaneous trades to be carried out instantly 2.Reduce trade execution-time from hours-to-minutes 3.Provide complete& current market intelligence to support traders execution decisions 4.Ensure full&timely trade and completion documentation&regulatory filings 5.Provide complete&incorruptible audit trails 6.Remove bias& human-error risks 7.Maximise value by greatly scaling number of quotes obtained- human brokers typically only obtain 5-10 Halve brokerage fees

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AFLORITHMIC LABS LTD	An AI-voice-synthesis-driven personalised audio companion and its potential to counter acute loneliness for the elderly	£290,000	£203,000

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
Loneliness has reached epidemic proportions and is on its way to cost the British tax-payer billions every year. Researchers estimate that up to one in four people are sufferers and that cost to society amount to £6,000 per **person over ten years**. The "loneliness epidemic" has become such an omnipresent and expensive problem of our time that **the UK government has appointed a dedicated Minister of Loneliness** together with a long term strategy to fight it. **AflorithmicLabs, a London based deep tech startup**, tries to tackle this problem by leveraging recent improvements in **AI-driven speech synthesis and audio personalisation to help the ones that suffer most from acute loneliness: the elderly**. Social isolation - a lack of social contacts - has been identified as one of the key factors as more than a million older people say they go for over a month without speaking to someone. This project proposes **an inexpensive, always accessible, easy-to-use, digital companion app that can be opened by elderly persons anytime and regardless of their technical, motorical or psycholinguistic capabilities**. When acute loneliness is felt, the zero-click app can be activated and a message is read in the familiar tone and voice of a loved one. The solution alleviates the acute feeling of loneliness. For the user this means that the solution **does not rely on the availability of a loved one and can be used as an efficient self-service tool anytime**. User tests with an Alpha version of a prototype have illustrated the large potential of personalised audio for improving mental well-being across all age groups. AflorithmicLabs wants to use the learnings from this project to create applications for **related mental health issues, such as depression, pregnancy support including postpartum problems, addiction recovery guidance, grief support,** and **anxiety problems**.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VELCOURT LIMITED	Discovery of novel crops for UK agriculture	£157,818	£94,691

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
Oilseed rape, the bright yellow flowering crop seen up and down the UK is under sustained pressure from a pest, cabbage stem flea beetle, which has the ability to decimate crops. A viable alternative to oilseed rape which isn't susceptible to this pest is critical for supporting farm businesses but also the wider environment, safeguarding a break crop for farms and a pollinator for insects. Novel crop alternatives need to be investigated to evaluate their suitability and discover the best way to cultivate these crops to realise their full potential.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
COMCARDE LIMITED	Intelligent Routing for Digital Payments	£489,821	£220,419

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
With an increasingly online, global payments markets forecast to be worth $52.4 trillion/year by 2026, merchants must offer all customers' preferred payment methods for goods/services, 24/7\. Failing to offer the right payment methods is estimated to cost businesses $212bn/year. The payments industry has historically been dominated by a few large processing companies. An increasing reliance on e-commerce and the significant rise in volume of payments brought by this has been a significant change in a once stagnant industry. Innovation, competition and technological change are on the rise and payment processors have had to react in order to stay relevant. Despite this rate of change the power within the merchant/processor relationship has remained securely with the processors themselves, often at the detriment of the merchants. Comcarde has created a unique platform offering a payment Payment Resilience capability (payments switched to payment processor 2, if payment processor 1 fails) to address the frustration of payment outages, currently being trialled with a PLC customer. This project aims to further this to develop the next step change within the industry, by creating a 'logic gap' between merchants and processors. An independent platform with **Intelligent Routing** capability, sitting between merchants and payment processors, providing an unprecedented level of control over payment management, bringing with it significantly greater fee negotiating powers. In addition, the risk involved in connecting new payment processors can be substantially reduced, what was once a time consuming and expensive process can be completed efficiently and economically. This reduced risk allows merchants to trial up-and-coming and innovative yet unproven new payment service providers by significantly reducing the barriers to entry and enhancing the opportunities. With Innovate UK support, a 9 month programme of experimental development is required to advance this **Intelligent Routing** capability with a proof of concept pilot validated in a live environment. If successful, commercial exploitation will provide significant benefits to merchants of any size, in any industry, worldwide.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OXFORD FIBER LTD	Cleaved MPO fibre optic connectors	£373,531	£261,472

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
Optical fibre is used for for data-, tele- and internet- communications. Connectors, which allow interconnection of optical fibres, are a crucial part of optical fibre infrastructure and represent world sales of $3Bn. Increasingly, fibres are deployed as ribbons of 12 or more optical fibres and these must be connectorised. The spread of multi-fibre network architectures are hampered by the high cost of multi-fibre push-on (MPO) connectors. In this project, we will use develop technology to prepare MPO optical fibre connectors at substantially reduced cost. We believe that this will enhance the usage of MPO fibre connectors, leading to improved telecommunications worldwide. We will produce manufacturing equipment which can be used across the world to prepare MPO connectors. We will gain revenue both from machine sales and from licence revenue from our customers' sales of these reduced-cost connectors. Installing optical fibre networks requires billions of fibres to be terminated annually worldwide. Speed of installation is crucial. Using our new technology, we will also innovate an unique, field-installable connector which will dramatically reduce installation time for large, high capacity networks such as internet data centres. We will work with our partners to manufacture and sell this worldwide.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OXFORD FLOW LIMITED	Power Harvesting for SMART Water Valves	£387,637	£271,346

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
With burst pipes and road closures a part of every day life, it is difficult to ignore the growing problem of a leaking water infrastructure in the UK. One of the underlying problems is a lack of understanding of what is happening within the water network; the volume of flowing water and condition of the pipes are largely unmonitored. Two of the reasons for not measuring the network extensively are the lack of mains electrical power available for water utility providers to measure pressures and flows in the network, and the environmental and economic cost of battery replacement as an alternative. A power harvesting device that generates power from the flowing water would allow measurement and remote control of the water network, in turn reducing leakage. Oxford Flow are developing a reliable and cost-effective method of harvesting power from flowing water and using that power to supply measurement and control equipment around the valves that maintain the function of the water network. This will both increase the understanding of how the water network is functioning and allow the water suppliers greater control over their networks. In the long run, this will reduce leakage rates and the energy required to pressurise the network, allowing water providers to pass the cost savings onto their customers.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ARETE MEDICAL TECHNOLOGIES LTD	Respicorder device development	£186,742	£130,719

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
Chronic respiratory diseases like asthma and chronic obstructive pulmonary disease (COPD) cause a significant burden to those affected and health system expenditure. There is a great need for new and wider deployment of diagnostics, well recognised by patient charity groups, clinician societies, and healthcare evidence appraisers. This could help identify diseases earlier, personalise treatment plans, and help manage the disease proactively. It has long been known that most of the cost and suffering from these diseases come from short-term attacks or exacerbations. It is more recent that asthma and COPD have been understood to be 'umbrella' terms for a number of disease sub-types, that behave like different diseases. Arete is developing a multi-test diagnostic device for lung conditions. While such a device has been proposed before, no such devices have made it to the market. Our product could widen access and frequency to clinical-grade diagnostic tests, giving doctors better information to help manage their patients and reducing overall costs to the NHS and other health systems. This project is to further develop the physical device, and in particular its ability to efficiently and effectively change between testing modes. This development is critical to the performance of the device and future commercial growth of Arete Medical Technologies. The project will consider the design requirements for the device. The device will then be specified, designed, and prototyped to meet these requirements. Thirdly, the device will be tested to ensure it meets the requirements. At this stage, the device should be ready to be used in initial clinical studies. Public funding for this project will increase R&D jobs within the project budget and position the company for further growth on successful completion.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OnMyMobile	Exmore - immersive virtual exploration of of real environments	£206,680	£144,676

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 Exmore platform aims to create a mechanism for capture, management and delivery of an interactive immersive experience based on real world content. The focus is on giving users freedom to explore real world environments in an unstructured and unguided way. This differs substantially from existing game and XR technology where computer models and simulations are used. An example is a virtual visit to an ornamental parks and gardens. Exmore will give the user complete freedom to explore the physical setting, without need to follow any particular route through, or serial presentation, of the venue. High quality audio presentation and hyperfine geolocated audio mark up together with 360 views will enhance the experience. Real time interactivity with high quality visual environments imposes severe constraints on the use of buffered software technologies for media delivery over data networks. This in turn stretches the quality of service of the networks via increased demand for bandwidth and low latency. These changes represent a next generation delivery platform handling data that is an order of magnitude greater than existing media delivery approaches. This aligns with future wider deployment of 5G ad Wifi6 over the next few years, but this will only represent a partial solution to increased demand for bandwidth. Exmore will be testing approaches to resolving these conflicting demand using a pretotyping* approach made possible by an advanced network simulation platform. Exmore aims to focus delivery on smartphones, tablets and TVs, though VR headsets will be an option. This aligns with the available device base within the wider UK consumer market. Smartphones and tablets will facilitate convergence of media delivery with actual real world locations when users visit them. TVs will deliver an interactive experience representing an extension of the 'slow TV' concept. Users will be able to make extended, relaxing, visits to remote locations with flexible interactive engagement with the immersive presentation. The study will use human centered design practices to ensure user engagement and satisfaction with the delivered immersive environments and the opportunities interaction offers. A study with a focus on user quality of experience rather than a technical solution looking for an application. * pretotyping -- not a spelling mistake. See [https://www.pretotyping.org/][0] [0]: https://www.pretotyping.org/

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
IBEX INNOVATIONS LTD	Innovative multi-channel AI method for the improved diagnosis of upper extremity bone fractures in the trauma setting.	£411,623	£288,136

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 will develop the proof of concept of an innovative multi-channel AI method to improve the diagnosis of subtle fractures and lesions in the emergency and trauma setting. Digital radiology (DR) remains the standard imaging protocol for fracture detection after trauma and whilst the majority of pathologies are correctly identified, a significant proportion are missed, leading to a delay in diagnosis, increased pain and suffering and additional costs from repeated diagnostic tests and treatment. Radiologists assess many features of a standard DR image to predict the presence of pathologies -- for example a change in bone shape may indicate the presence of a lesion or spur, whilst changes to soft tissue may indicate a radiographically occult fracture, that requires a more detailed inspection of bone structure in the affected region. However, trauma radiologists have limited time to manipulate image contrast, and certain pathologies will be missed if they are not immediately obvious in the radiograph. The project will build upon the unique IBEX Trueview(r) technology which has been developed with the support of previous InnovateUK funded projects. Using standard DR images, Trueview generates improved image quality and unique composition-based outputs to suppress soft tissue contrast and boost bone fine detail, thereby improving the visibility of subtle fractures and other pathologies. Trueview includes a proprietary AI-based bone segmentation algorithm to accurately segment bone from soft tissue with limited training data. The project will have three primary aims: 1) To further enhance the proprietary "IBEX XNET" AI-based bone segmentation method to generate an additional quantitative bone morphology output; 2) To develop new composition-guided post processing methods to create independent bone-enhanced and tissue-enhanced diagnostic images; and 3) To create a novel multi-channel AI method that uses these unique outputs to identify areas in the radiograph which merit further assessment by a trained radiologist.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MEDIA SENSE COMMUNICATIONS LIMITED	DIPA - A REAL TIME DIGITAL MEDIA AUDITING PLATFORM	£499,374	£349,562

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
MediaSense is a small UK company, who provide independent media auditing and advisory services to a range of large global clients. MediaSense have several service offerings, including DiPA which provides detailed analysis and insights specific to a client's digital media spend, efficiency and effectiveness. The purpose of this project is for MediaSense to refine the DiPA service, codify core processes and algorithms, automate data processing, validate the utility of AI/ML models and ultimately produce a minimum viable product that can be tested in the market. Due to the very large scale and diversity of the data sets involved, this project introduces innovations in data unification, processing, labelling, algorithmic analysis and the provision of real-time digital media auditing as a product. This project will allow businesses, governments and other institutions to take greater control of their digital ad-spend, and to gain a comprehensive understanding of its impact, efficiency and effectiveness. The resulting product beta will have the potential to greatly reduce advertising fraud, improve transparency and accountability in the digital advertising marketplace. The project has benefits to UK taxpayers as it will reduce the amount of advertising money that makes its way to fraudulent and criminal activities. It will also help UK business to protect their brand reputation, deliver higher ROI media campaigns, be more profitable and grow faster. These benefits combined deliver both positive societal and economic impacts.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ABLATUS THERAPEUTICS LIMITED	Bimodal Electric Tissue Ablation: First-in-Person Clinical Study	£969,387	£678,571
Cambridge University Hospitals NHS Foundation Trust		£180,794	£180,794
EG TECHNOLOGY LIMITED		£279,000	£195,300

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
Colorectal cancer is the second most common cause of cancer-related deaths in Europe and North America, after lung cancer (Jemal et al., 2007). In the UK, approximately 34,500 new cases of colorectal cancer and 16,200 deaths were registered in 2001 (Cancer Research UK, 2005). This equates to 1 death in the UK from colorectal cancer every 32 minutes. About 70% of patients with colorectal cancer develop secondary malignant growths in the liver, known as colorectal liver metastasis (CLM; Rothbarth et al., 2005). Overall life expectancy is mainly determined by progression of CLM, rather than the primary cancer (Paschos and Bird, 2008). Without treatment, life expectancy with CLM is less than 1 year (McMillan et al., 2007). Surgery to remove the entire metastasis is the only current hope of cure in CLM. Yet, 80% of patients with CLM are not suitable for surgery (NCCN guidelines, 2016), either because of the tumour's location (close to major blood vessels or bile ducts), or because the patient has limited liver function, or is considered high surgical risk (e.g., because of their age). Thermal ablation is a promising CLM treatment, which relies on localised heating to destroy tumour cells. Most commonly, the heat is generated by radiofrequency alternating current (AC). However, radiofrequency ablation is only suitable for CLM with ? 5 lesions and tumour sizes < 3 cm in size (Crocetti et al., 2010). It is challenging to limit tissue heating and avoid charring and vaporisation (Guenette and Dupuy, 2010). Ablatus was founded in 2015 and is the first spin-out from Norfolk and Norwich Hospital. Our novel technology, known as Bimodal Electric Tissue Ablation or BETA, was invented by Dr John Cockburn and Dr Simon Wemyss-Holden (Cockburn et al., 2007) and is now wholly owned by Ablatus. BETA is a disruptive and game-changing innovation that goes significantly beyond current state-of-the-art ablation techniques. We combine AC radiofrequency ablation with direct current (DC). DC induces water flow from surrounding tissues to the ablation site, protecting the tissues from desiccation, enabling much larger tumours to be treated, as well as potentially enabling ablation of previously untreatable tumours, with fewer adverse patient impacts, at a lower cost to the NHS. This project builds on the successful delivery of Ablatus' previous Innovate UK project with eg technology (103351) and will support further collaborative prototype development between Ablatus and eg technology, culminating with first-in-person trials of our device with Addenbrooke's Hospital.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CENTRE FOR ADVANCED TRANSPORT ENGINEERING AND RESEARCH - EUROPE LTD	Real-time AI enabled rail track inspection and analysis [RAPPID]	£180,717	£126,502
MONIRAIL LTD		£154,450	£108,115
NETWORK RAIL INFRASTRUCTURE LTD		£20,602	£0
TWI LIMITED		£122,460	£122,460

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
Current inspection of rail track defects utilises Network Rail's four Ultrasonic Testing Units (UTUs) that traverse the UK network, 64,000 miles of track, in 750 shifts per year. With a limitation of 30 miles per hour for rail track inspection, UTUs cannot meet the high demand and increased capacity of customers. Every day, 4.8 million people travel by train in Britain. Around 200,000 tonnes of freight and goods are transported by rail in that same time frame, supporting businesses and consumers, productivity, and economic growth whilst taking thousands of lorries off the road, and helping in the reduction of greenhouse gasses. A risk-free network of rail tracks across the UK is pivotal to Network Rail's long-term planning process strategy and its vision for running a safe, reliable, efficient and growing railway, in Control Period 6 and beyond. Undiscovered rail track defects lead to asset failure, unscheduled maintenance, timetable delays, accidents, and fatalities. Train delays cost passengers 3.6 million hours in 2016, whilst over £72M was claimed by passengers from operators for service disruptions in 2016/17\. With the growing demand on rail transport by passengers, there is need for commercial solutions that offers high-speed (i.e. above 60 miles per hour) high resolution, rail track inspection, and data analysis in real-time. A commercial solution with the capacity to enable UK network-wide coverage. This RAPPID project seeks to address the challenges that the UK rail network faces regarding rapid high-speed high-resolution identification of rail track defects, data collation and analysis, enabling real-time predictive analysis, and predictive maintenance of rail tracks across the UK network and globally. The RAPPID project is based on the novel use of Virtual Source Aperture non-destruction testing techniques in combination with artificial intelligence and deep-learning methodologies that enable real time data processing and analysis of rail track data derived via use of next generation phased-array ultrasonic testing hardware.

Results of Competition: Innovate UK Smart Grants: July 2019

Competition Code: 1907_SMART_GRANTS_JULY

Total available funding is £25 million across Stream 1 and 2.

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
METRASENS LIMITED	A novel Smart Metal Detector (SMD) to detect and locate real threats (e.g. handguns and knives) without interrupting the normal flow of public, thus leading to far more accurate, efficient and cost-effective security screening	£1,299,139	£909,397
RAPISCAN SYSTEMS LIMITED		£199,630	£99,815
The University of Manchester		£357,200	£357,200

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

Gun and knife crime are clearly severe global problems. In the last 10 years, the UK has unfortunately experienced **245,632 criminal offences** caused by knives or sharp instruments, of which **1,745 resulted in deaths.** Since 2002, handguns have caused 8,316 injuries and killed an estimated 330 people in the UK \[ONS\]. In the US alone, there have been 2,128 mass shootings since 2013\. **This translates to approximately one mass shooting per day** \[Gun Violence Archive\].

High footfall public areas such as stadia, arenas, shopping centres, transportation hubs and other places such as schools and nightclubs represent the ideal targets for mass killings, gun and knife crime. These places require **accurate and cost-effective high throughput screening** for concealed threats such as knives and guns without disrupting public flow.

However, existing Walk-Through Metal Detectors (WTMD) fail to accurately discriminate between threat items and harmless metallic objects such as watches, jewellery and mobile phones. To avoid constant false alarms, current WTMD require full divestment of possessions. **However, this significantly reduces throughput rates down to 360 - 600 people/hour, which disrupts public flow, increasing delays, queuing time and public frustration.** Increasing the number of screening lanes increases labour costs, which is prohibitively expensive and sometimes impractical for venue operators.

Thus, an unmet market need exists for an accurate and cost-effective detector, capable of discriminating threat vs. non-threat items in near real-time to reduce the need to fully divest and thus increase throughput.

METRASENS, a rapidly growing UK SME and **RAPISCAN,** a global provider of security screening products, are partnering with the **UNIVERSITY OF MANCHESTER,** experts in novel electromagnetic systems to develop a truly novel threat detection system.

Using a sophisticated array of transmit and receive coils, the **Smart Metal Detector** will identify and locate any threat object by measuring the signatures (Magnetic Polarisability Tensors) of all metal objects carried by each person and comparing those specific signatures to a library of previously classified objects. This reduces the need to fully divest as the detector will accurately distinguish between genuine threats and harmless metallic objects.

The Smart Metal Detector represents a paradigm shift in security screening technology, which will enable the accurate discrimination between items, particularly small items such as handguns and knives, without interfering with the public or interrupting public flow. With a vast number of urban soft targets worldwide, this project will significantly boost UK exports, increase safety and improve the visitor experience.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SHIPTON MILL LIMITED	Shipton: Novel pre-mix flours	£351,852	£211,111
CAMPDEN BRI (CHIPPING CAMPDEN) LIMITED		£140,486	£140,486

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Project description - provided by applicants
Founded in 1979, Shipton Mill is the UK's largest organic specialty flour miller. Shipton Mill, alongside project partner Campden BRI, will build on recent scientific advances to develop a unique product portfolio for industrial bakeries and home bakers. This innovative R&D project will enable Shipton Mill to extend its penetration of the UK baking ingredients market and to build upon their international profile and further drive export sales. The project will bring significant social and economic benefits to the UK and will further establish the UK as a lead in the flour and baking ingredients markets.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CLOUDNC LTD	Autonomous Rapid Machining (ARM)	£721,280	£504,896
GKN AEROSPACE HOLDINGS LIMITED		£0	£0
Manufacturing Technology Centre		£145,527	£145,527
THALES HOLDINGS UK PLC		£0	£0
University of Sheffield		£104,003	£104,003

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Project description - provided by applicants
The global CNC machining market is worth \>£100Bn, and serves every manufacturing vertical. The two greatest costs of machining metal are (A) programming of CNC machines (B) operating the CNC machines to cut the metal (cycle times). The balance of costs varies on batch size and complexity of the piece. The greatest inefficiencies of machining are in programming and cycle-times. Today CNC machines must be manually programmed by skilled human operators, even the best of whom are unable to determine the optimal solution for producing the component. The standard (non-optimised) cycle-time results in production costs of typically more than twice what is theoretically possible with the same equipment. CloudNC has **already** developed an automatic approach to CNC programming that is disruptive and revolutionary, solving issue (A) by fully automating the process of programming a CNC machine for production, This software has been built completely from scratch, utilising complex and novel computational mathematics approaches, applied physics, extreme-performance computational geometry algorithms, and large-scale parallel computing from the cloud. Normally hours, weeks or months of skilled human CAM programming time is required to produce a component, but with CloudNC this can **already** be achieved with a single press of a button. **However when CloudNC upload this program as the instructions to the CNC machine to cut the workpiece, the resultant cycle-time and quality is only as good as a skilled CAM software programmer can achieve in standard time.** As such we do not yet address the market need for highly optimal machining cycles that can achieve narrow tolerances required by high-end industry (<20 microns). This 2 year project brings together the expertise and prestige of MTC, AMRC, GKN and Thales UK to take CloudNC's disruptive work one giant stride further. We know that a skilled CAM programmer can achieve improvement on standard cycle-times by up to a half through spending three months+ on improving their standard program. **CloudNC will now emulate the techniques used to reduce cycle-time, and will use advanced software techniques to further reduce cycle-time.** **The aim of the project** is to demonstrate on industrially relevant components substantial reductions in production cost through reducing cycle-times and ensuring adherence to tolerances first time without rework. It will ensure that quality control is as high as possible through fully understanding and incorporating the limits of top speed autonomous machining given the tight tolerances our end users require.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OXMET TECHNOLOGIES LIMITED	MeshWorks - an innovative bimodal trabecular mesh and new titanium alloy for spinal implants	£501,720	£351,204
BETATYPE LIMITED		£183,682	£128,577
University of Birmingham		£87,292	£87,292

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
Orthopaedic degeneration is a normal part of aging, anticipated to affect ~80% of the world's population. The Office for National Statisticsestimates the UK's proportion of over 65s will rise to 20.7% by 2027, so the financial and societal impacts can only increase. In the past decade approximately two million people in the UK had a metallic device implanted to replace a bone or joint in their body, with surgeries increasing at 7%/year. The most common surgical intervention is hip or knee replacement followed by spinal fusion implants, then implants to other joints. Around 250,000 procedures are conducted in the UK each year. However, around 50% will have non-ideal results, with 40% of patients still unable to return to work up to 4 years after surgery. Up to 20% will require a revision, with 75% of these due to the implant failing. OxMet has designed a new alloy for use in medical implants that eliminates current problems such as: * High stiffness: stiff implants which 'stress shield' surrounding bone, causing bone cells to weaken and die, loosening the implant. * Cytotoxicity: Ti64, one of the most common implant materials, contains cytotoxic vanadium and aluminium. * Compatibility with Additive Manufacture: Current implant materials are not designed for use with additive manufacturing, resulting in defects and fracturing. OxMet and Betatype have designed a new mesh that more closely matches the structure of cancellous bone. Closer matching improves implant osseointegration, both in terms of speed and strength, reducing failure rates. The design takes advantage of Betatypes' bespoke proprietary algorithms that are both quicker and improve control. OxMet and Betatype will work with the University of Birmingham to provide proof-of-concept evidence for the improved effectiveness of the combined alloy and mesh.

Results of Competition: Innovate UK Smart Grants: July 2019

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
FLYLOGIX LIMITED	Project Starling	£966,348	£676,444
CAMBRIDGE CONSULTANTS LIMITED		£156,914	£78,457
TRANSOCEAN DRILLING U.K. LIMITED		£191,200	£95,600

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Project description - provided by applicants
Flylogix provides low-cost, long-range Unmanned Aerial System (UAS) operating Beyond Visual Line of Sight (BVLOS). They currently service the offshore energy sector in the UK. This project with leading telecoms developer, Cambridge Consultants, and the leading offshore drilling contractor, Transocean, enables a centralised command and control capability from headquarters by solving integration, cost and reliability engineering problems to deliver a low-cost communications system, infrastructure and associated concept of operations. This product and service improvement is achieved by tackling the command & control component within the complex system of UAS operation. This facilitates the remote piloting of a UAS from a central control centre. Critically this project reconciles the competing requirements of high reliability demanded by regulators and low-cost demanded by customers.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MICROBIOSENSOR LIMITED	PeriFAST: a new product to rapidly identify effective antibiotics to treat peritonitis in vulnerable kidney and liver failure patients.	£1,176,040	£823,228
DATALINK ELECTRONICS LIMITED		£307,894	£215,526
TAGDRAW LIMITED		£203,148	£142,204

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
Patients with advanced kidney disease, who are reliant on peritoneal dialysis (PD), and advanced liver disease patients, with liver cirrhosis, are both at risk of life-threatening infection in the abdomen, referred to as 'peritonitis'. This develops quickly, and typically requires hospital admission. The choice of antibiotic therapy has to be made by doctors 'blind', based on an educated guess. After around 4 days antibiotic susceptibility information arrives from the hospital's centralised microbiology laboratories. Frequently the choice of antibiotics is then modified, however by then the infection may have progressed appreciably, in many cases fatally, and most patients are extremely ill. Managing these patients is very expensive for health-care providers, with this exacerbated as PD patients must permanently switch to more expensive haemodialysis. There is an urgent need for doctors managing these critically ill patients to rapidly and reliably obtain antibiotic sensitivity information. Microbiosensor is a Manchester-based company developing products miniaturising and speeding up conventional high quality hospital microbiology tests. These are made available in a simple, and inexpensive form for use at the bedside with vulnerable patient groups. We have previously developed a device (QuickCheck) to screen for peritonitis in the homes of PD patients, where the therapy is normally carried out. This test takes ten hours (running alongside overnight PD as the patient sleeps) and if positive initiates further hospital antibiotic sensitivity investigations. We are currently developing a product for elderly urinary tract infection patients in care homes, quickly providing antibiotic susceptibility information (STAR). The proposed PeriFAST product is our most ambitious yet, and will test peritoneal fluid from both liver and PD patients, which of 10 antibiotics will be effective in four hours, displaying this information clearly on an electronic screen. We will work in a consortium with two long-established UK companies. Tagdraw Ltd (trading as Smallfry) are an innovative design consultancy for medical products and Datalink Electronics are a contract high technology electronics design and manufacturing company. In the project we will adapt our chemistry for use with new antibiotics and liver patients, design a disposable cassette to house the test, develop an electronic reader to provide the result, check the new system works with real peritonitis samples and manage the IP. By project end, we will be ready for the product to enter its final clinical assessment before CE marking. The product will be sold on an annual tariff basis, and address large potential global markets.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
KROHNE LIMITED	Development of advanced, highly corrosion resistant Coriolis mass flow meters (Adv-Flow)	£271,439	£135,720
LANGLEY ALLOYS LIMITED		£110,446	£66,268
TWI LIMITED		£162,948	£162,948

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Project description - provided by applicants
In Adv-Flow we will develop the next generation of advanced, high temperature Coriolis mass flow meters. The large line size products that this project is targeting are particularly suited to the oil and gas, and chemical markets. The increasing demand for operation in demanding and challenging departments has created the opportunity for KROHNE to develop new product lines based on advanced materials. Our state of the art Coriolis flowmeters are recognised as being world leading with total annual sales of 18,000 of which 15,000 is from manufacturing based in the UK. In order to meet this business need, we have identified that we must overcome the technical challenges associated with developing our product lines using new, highly corrosion resistant materials e.g. duplex, super duplex and hyper duplex stainless steels. To achieve this we have identified critical project partners Langley Alloys and TWI for their expertise in the base materials and vacuum brazing, which will significantly de-risk the project. The project will explore opportunities for innovation related to product design, alternative braze filler metal compositions and within the manufacturing process. KROHNE has been particularly successful with its OPTIMASS 2000 line of large straight tube Coriolis meters. These offer a unique patented configuration that gives benefits to the end user in terms of installation envelope and low pressure drop. This benefits the end user in lower installation and pumping costs. Typically these are manufactured from standard stainless steels and we have identified an opportunity for new products with superior corrosion resistance.

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