Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
COAXIAL POWER SYSTEMS LIMITED	HiSpRing Frequency-Agile RF Generator for high-speed welding	£132,630	£92,841

Project description - provided by applicants

Coaxial Power Systems Limited (CPS) has identified the need for an overhaul of industrial RF generator technology, addressing inefficient legacy generator designs, improving the weld quality and efficiency of RF welding plant, removing obsolescent electronic valve amplifier technology, and enabling manufacturers to automatically stabilise the weld power and to weld faster.

The HiSpRing RF generator project represents a low-cost, high-reliability embodiment of the power monitoring & matching technology commonly used in scientific and medical applications, coupled with a solid-state amplifier architecture now common-place in radar and data-communications applications, suitably ruggedized for industrial welding environments. The key innovation is the demonstration of a kilo-Watt RF Generator with self-tuning (in an RF welder application) achieved in sub-millisecond timescales. With the HiSpRing RF generator, efficiency of the welding system is improved, enabling lower running (energy) costs, improved reliability, and reduced maintenance down-time. Improved load matching (and consequent reduction in RF power required for welding) reduces the RF power level needed in the welding equipment, and improves the quality of the welded material.

Given the dated state of installed industrial RF Welder Generators world-wide, the performance, reliability, power consumption and size & weight efficiencies offered by this HiSpRing RF generator are game-changing, and disruptive to a largely US- and Far East-based incumbent competitor base. Support for the HiSpRing project has been obtained from multi-national medical packaging and performance footwear manufacturers, who already recognise the process and cost benefits in their RF welding manufacturing processes, offering superior weld characteristics to thermal welding, combined with fine control and improved quality assurance throughout the weld.

The culmination of the project will be demonstration of the new RF generator in an RF welding workstation, to support dissemination of system-level characteristics and performance, alongside the performance characteristics of the new HiSpRing RF generator module. HiSpRing also addresses the wider challenge of improving manufacturing productivity (a persistent problem in the UK).

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CORIOLIS TECHNOLOGIES LIMITED	Data and Analytics for Real-time Trade modelling (DART)	£317,114	£221,980
NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH(INCORPORATED)(THE)		£129,502	£129,502

Project description - provided by applicants

Need - UK government wishes to support SMEs to increase trade. To assess trade and supply chain impacts of policy changes and political/economic events like Brexit, politicians, trade negotiators and businesses require consistent, granular and timely trade data. However, existing data is inadequate due to poor granularity, trade asymmetry and lack of data for services and supply chains.

Market opportunity - UK and Global market opportunity to provide accurate trade data to Governments/central banks for forecasting trade and supply chain impacts of policy.

Project Objectives - This project will conduct Industrial Research to prove viability of DART, a unique Analytics-as-a-Service (AaaS) platform, producing accurate, near real-time, granular trade data for goods/services.

Approach - User-centred development with customer/supply chain relationships built and customers engaged for specification and feedback.

Innovation - DART is the first Analytics-as-a-Service (AaaS) platform for Global Trade, providing policy makers unique and value-added services.

Impact - DART is core to Coriolis' strategy and represents step-change in capability and competitive advantage. Project increases NIESR's knowledge of trade's impact on GDP/productivity and stimulates further research into trade modelling.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CONVERSATIONAL AI GROUP LIMITED	Conversational Artifical Intelligence - a unique real-time voice analytics technology providing highly accurate behavioural determinations - scalably enabling the identification of fraud in insurance claims	£499,404	£279,666

Project description - provided by applicants

Latest figures for 2017 indicate the volume of frauds recorded by Action Fraud is the highest it has ever been at 272,980 offences(5,250/week), insurance fraud totals a value of £3B/yr. Dishonest liability claims ("slip and trip") rose 36%/yr since 2015 with claims value up 14% (£391M), however the biggest victim is car insurance, with 80,000 claims detected 2017(£1B). These resulted in increases of insurance premiums and time/review before insurers pay legitimate claims (increased scrutiny of honest customers).

At insurance contact centres (first contact point), there are limited current solutions to identify exaggerated claims information. Statistical models identify claim types that have higher probability of being fraudulent; voice stress tests identify changes in pitch&tone. These don't provide a defined output (only indicate 'likelihood') and are easily influenced by line of conversation/first languages/mental health/hearing difficulties. No current solution can measure linguistical changes, which is the primary identification parameter for this type of fraud.

Conversational AI (CAI) is developing an entirely innovative model combining the unique team expertise of insurance fraud/behavioural analytics/detective work/machine learning/language processing to a near real-time call "credibility" score to identify fraudulent insurance claims. The company plans to provide their software as an add-on service to existing call recording platforms thereby offering: automated screening of every call increasing investigation efficiency by a factor of 60/data transparency/enhanced customer outcomes/safeguarding vulnerable customers/ensuring regulatory compliance/improving anti-fraud measures.

CAI are well placed to exploit this opportunity, having already established basic linear algorithms with the ability to detect 50 nuances in human behaviour to understand contextualise emotion, successfully identifying deception using manually transcribed call data. As a new joint venture combining Intelligent Voice's existing and proven language processing capability with Strenuus' behavioural analysis expertise, CAI will develop a software system capable of identifying human interaction using GPU powered automatic speech recognition transcripts. Interest has already been expressed from voice biometric software providers offering open access to their API for data acquisition, and contact centres who have confirmed their willingness to trial the solution.

With support from Innovate UK a 12-month programme of R&D is required to deliver a validated system in a closed live environment, identifying crucial markets in caller credibility assessment based on-agent and caller interaction. CAI has the potential to disrupt the voice biometric and anti-fraud markets with global exploitation potential. The project will deliver export led growth for CAI, a substantial ROI (12700%), increased employment(25 additional jobs) and further R&D opportunities.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BUCKINGHAM HEALTHCARE LIMITED	Innovative Transfer Board	£229,135	£160,394
Bournemouth University		£33,316	£33,316

Project description - provided by applicants
Established in 2001, Buckingham Healthcare is a market-leading British designer and manufacturer of healthcare and daily living products. The company has a strong existing network of distributors (both direct-to-consumer and healthcare providers) and a well-established brand in the UK and overseas markets. The proposed project seeks to demonstrate proof of concept for an innovative, assistive living device for individuals with limited mobility, for use in hospital, care-home and/or home-environments.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CAMSCIENCE LIMITED	APRET - Automated Printhead Remanufacturing Evaluation and Test	£49,440	£34,608
EX-TRAORDINARYWORKS LTD		£18,790	£13,153
I4 AUTOMATION LTD		£14,073	£9,851
L&C PRECISION ENGINEERING LIMITED		£23,077	£16,154
METEOR INKJET LIMITED		£10,800	£7,560

Project description - provided by applicants
Camscience have developed a novel remanufacturing process for industrial printhead that enables them to be re-used in printing production indefinitely. Such heads have unit cost of between £2000 and £10,000 and are a key component in all forms of industrial printing, including publishing, 3D printing, wide format printing of textiles ceramics and wall coverings. Digital printing continues to be a major technological growth area. Currently the Camscience process in manual, and requires some skill to operate it successfully My vision for the APRET project is to fully automate the remanufacturing process so that it is delivered at the touch of a button, and after remanufacturing perform print head quality testing and printing to validate the success of the operation returning a printhead to equivalent to new condition. It is expected that Camscience will seek funding at the completion of this project to allow international growth of this technology in global markets.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
IMPACT LABORATORIES LIMITED	NETCYCLE - A Novel Method for the Efficient Recycling of End of Life Fishing Nets	£123,978	£86,785

Project description - provided by applicants
In the North Sea alone upto 500,000 tonnes of plastic fishing nets are disposed of each year. Currently there is no commercial way to recycle these nets even though they are made of highly desirable plastics such as PE, PP and PA. Impact has developed a new method of recycling enabling recyclers to gain access to a completed new feedstock and giving fishing companies and authorities a route to dispose of their broken or old fishing nets. Ultimately this technology will reduce the environmental damage caused by plastic fishing nets whilst providing a high quality recycled material to be sold back into the circular economy.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
THOUGHTRIVER LIMITED	ThoughtRiver - Deduction By Analogy (DBA)	£286,638	£200,647
ILEXIR LIMITED		£126,086	£88,260

Project description - provided by applicants
ThoughtRiver has developed a platform which automatically reads and reviews contracts enhancing users' ability to efficiently review, understand and interpret complex contracts. The company has researched and pioneered advanced technologies that can tell a user which contracts to look at and which sections to focus on, without needing to read them. The proposed project seeks to build upon this unique platform to develop new, industry-leading functionalities, driving further adoption of ThoughtRiver's technology in the professional services sector. The project will directly address the factors that currently impede technology uptake such as existing solutions' inability to understand the legal context surrounding contractual issues and language processing limitations that prevent understanding of non-standard clause formats. Increased industry adoption of contract review technology would allow professional services firms to provide more valuable risk management, auditing and insurance services to consumers, corporates and shareholders. This has the potential to make the UK economy more robust and less vulnerable to systemic risks.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
MDF RECOVERY LIMITED	Closing the Loop in the MDF Supply Chain	£162,837	£113,986
KRONOSPAN LIMITED		£277,362	£138,681

Project description - provided by applicants

The ambition of this project is significant. MDF has been produced since the 1960s and yet it remains the only wood based product that is currently unrecyclable. The most sustainable outcome for the UK's estimated circa 400k tons p.a. of MDF waste today is incineration with energy recovery. However, MDF Recovery is a transformational technology that converts a costly and problematic waste stream into a high value natural fibre raw material. This project is also highly ambitious in that it seeks to introduce an innovative approach that supports the concept of circularity in relation to the treatment of MDF at the end of its first user life.

A succesful outcome to this project would result in full validation of the MDFR technology in a commercial environment. The demand for the technology is apparent, both in the UK and further afield. The deliverables produced during this work would allow for rapid uptake and exploitation of the technology in the UK. The last remaining technical and commercial barriers would be overcome and the world's first commercial scale recycling of medium density fibreboard would take place in the UK by 2021\.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
THERMETRIX LTD.	PODIUM™ - A home device and cloud-based software and algorithm for diabetic foot ulcer monitoring	£100,846	£70,592

Project description - provided by applicants

Over 422m people (ca. 9% of the world's adult population) live with diabetes, of which 60m are European and 3.8m are UK citizens. The high mortality rate of people suffering from diabetes is directly related to its complications (3.7m deaths worldwide)13\. One of these life-threatening complication are diabetic foot ulcers (DFUs) which affect 12 to 25% of people with diabetes\[4,5\].

DFUs are often caused by trauma to the foot. Unlike healthy people 60-70% of diabetics can be affected by neuropathy, meaning they have no sensation in their feet and do not feel pain \[14\]. Diabetic neuropathy alone causes between 45-60% of DFUs\[15\]. DFUs can result in foot or even leg amputations. Aside from the physical and emotional pain, healthcare costs are considerable. Up to 450,000 lower limb amputations are performed in Europe annually, costing health authorities ca. €2--€2.5bn. In UK, there are over 7,000 lower limb amputations annually\[7\] costing the NHS £524m--£728m\[12\]. Up to 80% of these amputations are potentially preventable\[11\]. Up to 70% of people die within 5 years after amputation and around 50% die within 5 years of developing a DFU\[10\].

There is thus an urgent public health need for an accurate, low cost and easy to operate technology for the initial detection of inflammation that precedes ulcer formation with greater predictive value than the current methods. Currently the assessment of such foot complications is done by clinicians through analysing blood circulations, lower extremity vascular status, plantar foot pressure, and/or foot neuropathy by simple visual inspection. Due to stressed health service budgets this done infrequently and therefore largely ineffective.

Thermetrix Ltd are developing proprietary technology called PODIUM(tm), a diabetic foot monitor and cloud portal for regular home use based on the principle that the formation of foot ulcers will be prevented if initial warning signs e.g. unusual swelling or redness of the feet are acted on at an early enough stage. Using a thermochromic liquid crystal sheet as primary detector, the thermal pattern produced by the sheet is picked up by a high-resolution camera and transmitted via smart phone and web technology to a cloud portal helping patients, family and medical staff to detect and immediately treat conditions before the onset of ulceration.

If detected early enough, inflammation can be reduced, tissue damage limited, and the foot will return to normal. Critically, up to 80% of DFUs may be avoided.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CPDSYS LIMITED	The Drop Keel Concept: an Assembly Focused Solution to Commercial Deep Water Floating Wind Turbine Development	£126,632	£88,642
OFFSHORE RENEWABLE ENERGY CATAPULT		£14,904	£14,904
University of Strathclyde		£38,773	£38,773

Project description - provided by applicants

Wind is proving to be a commercially viable source for generating electrical power. The UK is exploiting this opportunity with its consistent wind resource using wind turbines fixed to the seabed along its coastline up to 50 metres in depth.

Other coastal regions around the world are considering offshore wind turbine projects and, despite some being too deep for fixed seabed wind turbines, floating wind turbines may provide the solution.

18 miles offshore Peterhead, Scotland, such a test program is in operation. Known as Hywind Scotland, the project deploys five interconnected floating turbines supplying sufficient electricity to power 20,000 UK households.

The next step in development is to design floating foundation structures with commercial potential for mass production. Test level projects may then be scaled up to develop floating windfarms deploying hundreds of interconnected units supplying commercially viable electricity to the world's major coastal cities.

Designs for the floating bases upon which the turbines stand remain a challenge. The Hywind floating bases must be assembled in deep water Norwegian fjords and specialist heavy lift floating cranes for construction which add to the project cost. Alternative floating base designs present different construction challenges such as large widths that make assembly and launch difficult using facilities found in typical ports. Also, the UK currently has to rely on intellectual property rights owned in the US, Norway, France and Japan to take advantage of this new technology.

CPDSYS Ltd is investigating how to optimise floating wind turbine foundation design and intallation. It has developed the Drop Keel concept, a compact, shallow draft design which Atkins Engineering has analysed and identified as possessing operational performance and motion characteristics acceptable for commercial wind turbine operation. Scale model tank tests are planned with Strathclyde University for a 10MW capacity unit followed by further analysis to investigate the relationship between wave motion, aerodynamic performance and motion control systems. The objective is to produce a full scale Drop Keel foundation design protected by UK Intellectual property rights that not only supports renewable power opportunities in the UK's deeper coastal waters but also meets the demands of a global export market.

CPDSYS is also investigating how the Drop Keel concept may support marginal deep water oil and gas fields by providing a source of electricity in remote marine locations that could assist with recovery of hydrocarbons similar to the way that pump jacks (nodding donkeys) power onshore oil wells.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
METRASENS LIMITED	CAST – A Next-Generation Threat Detection System to Prevent Mass Casualty Attacks to Soft Targets and Protect Citizens' Lives	£494,695	£346,286

Project description - provided by applicants

Events at large venues like arenas and stadia attract tens or even hundreds of thousands of people. **However, these urban 'soft targets' and their perimeters have recently become vulnerable to malicious mass casualty attacks.** The deadly atrocities at Manchester Arena and France's National Football Stadium are graphic examples of the increasing global threat of terrorism on soft targets. **These extremist terrorist attacks kill innocent people including children and lead to severe economic and social disruption.** In 2017, the five terror attacks in the UK, including the Manchester Bombing, led to economic losses of £3.5bn \[RAND Europe\]. The last six mass casualty attacks in Europe resulted in 188 deaths and 808 injuries \[Heritage Foundation\].

Existing solutions **such as portal-based detectors (whether metal detection or millimetre wave imagers) are ineffective for outside perimeter screening.** They are slow, labour-intensive and highly overt. They require individuals to divest their possessions, forcing them through a portal which becomes impractical, costly and creates a target in itself. Drones, CCTV, security guards and K9 units are merely observational methods and do not detect threats.

There is thus a large and growing need to protect the perimeter of 'urban soft targets', before a threat can be realised, without causing disruption to the free flow of people or the venue.

This project will develop CAST - **a novel, covert, mass casualty threat detection system based on processing signals from a networked array of advanced ferromagnetic sensors embedded into the built environment, to automatically detect threats.** Integrated with a video management system, CAST's innovative system will 'tag and track' a suspect once an alert has been triggered, allowing security operatives to intercept the individual far enough from the venue to prevent deadly attacks.

However, detecting threats from the built environment reliably and accurately poses significant technical challenges, especially to discriminate against benign objects with similar magnetic signatures or interference from external sources. **Metrasens has a successful track-record of developing world-leading, award-winning ferromagnetic detection solutions and we currently export across 44 countries.** This Innovate UK project will allow us to capture a huge global export market and help address the government's top priority to fight terrorism.

5 years post-project, we expect to generate cumulative revenues and profit of £73.8m and £14.8m respectively, in turn creating 74 skilled jobs. **With a vast number of urban soft targets worldwide, this project will significantly boost UK exports, increase safety of citizens and protect infrastructure.**

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
RESPIRA LTD	AI algorithm development for wearable bio-monitoring device to help people who stammer	£95,000	£66,500
The Stammer Trust		£5,000	£5,000

Project description - provided by applicants

About 1.3% of the population stammers (Reilly et al., 2009). This condition has distressing symptoms that deeply affect social and professional interactions and can define the life choices of those people who stammer (PWS): 60% of PWS suffers from social anxiety disorder (SAD) (McAllister et al., 2017). Even if it is currently not possible to cure stammering, there exist a series of practices that, when mastered, help PWS to gain fluency levels similar to that of a non-stammerer. In addition to mainstream therapist led approaches, several companies such as the Starfish, DelFerro or McGuire Program, currently run courses worldwide to help people to overcome their stammer via these learned techniques.

The largest challenge to a PWS is turning these practices into habits, as this requires patience and dedication. We believe that technology can help in this endeavour: with the support of Innovate UK, we are developing a prototype of the first wearable device, RespiraBelt, that tracks breathing and speech patterns, providing real-time feedback and performance history to help PWS turn fluency promoting techniques into habits. Respira will also provide a platform to share the user's performance data with the speech and language therapist (SLT), who will supervise and customize the therapy. Finally, a discretionary pool of anonymous data will be shared with the scientific community to further stammering research. Respira acts as virtual coach for PWS; as a therapeutic tool for SLTs; and a scientific instrument. We have patented the innovative technology behind the RespiraBelt as it is the first of its kind, and in December 2017 our idea was awarded the Terence Barry Grant Award from the Stammer Trust. Detailed information about Respira can be found at www.respira.io.

The current project is aimed at developing the algorithms that will unequivocally detect and evaluate when the user is practising habits that will improve their fluency. For that purpose, AI and machine learning methods will be used. This project is conducted in consortium with the Stammer Trust, which enables a trustful relationship with the PWS taking part in our research, as well as provides assurances that the best interests of our future clients are at the core of our project.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
NODENS MEDICAL LTD	Millimetre-wave AI-enabled Smart Healthcare monitoring	£27,910	£19,537
Queen Mary University of London		£10,892	£10,892

Project description - provided by applicants

NHS hospitals are experiencing widespread shortages in bed space and front-line staff time, contributing to long waiting times and budget shortages. This is largely because demand for services is outstripping growth. Improved efficiencies and patient flow could release up to £900M per annum in savings, save staff time, and free up facilities. The NHS is tackling this through pilots of real-time location sensing (RTLS) technology, which seeks to track patients, staff and equipment in real-time. This has many potential benefits such as: finding equipment more quickly, identifying available bed space, and monitoring patient-staff contact time. However, currently existing product solutions suffer from a combination of: relatively poor tracking accuracy and reliability, expensive and bulky tags (unpopular with staff and patients), and high infrastructure costs. The project seeks to develop an artificial intelligence (AI)-based millimetrewave sensing technology to provide industry-leading tracking resolution, at low costs and ease-of-use.

The millimetrewave (mmWave) regime (approximately 30-300 GHz) encompasses the band of the electromagnetic spectrum between microwaves (Wi-Fi, mobile phones) and infrared. Due to recent technological breakthroughs, mmWave electronics will in coming years be used for automotive radar, next-gen Wi-Fi (WiGig) and mobile communications (5G). The technology also allows us to sense objects with extremely high precision, and detect movements of less than a millimetre. This could include wireless detection of heart beats, as well as fall detection or patient tracking, all done without necessitating any worn tags. While our current prototype sensor is extremely accurate, it does not have the 'intelligence' to process all the data it receives, and can have difficulty distinguishing between different objects; so it may not be able to tell between a patient and a bed, for example.

To overcome this shortcoming, NodeNs Medical proposes to use state-of-the-art AI algorithms to give the sensor 'smart' capabilities, allowing it to learn to distinguish between different detected objects. This could be done by recognising the periodic rhythm of a heart beat, or a person's swinging arm or leg.

NodeNs Medical will develop a 'smart' AI-enabled mmWave RTLS solution which will:

1. track patients, staff and equipment, to identify if staff have visited patients or to track infection spreading,
2. monitor for fall detection,
3. track vital signs.

The device will have market-leading accuracy and 'plug-and-play' capabilities for easy installation, helping the NHS to improve patient outcomes while lowering costs.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
KOIOS MASTER DATA LIMITED	Using Artificial Intelligence and Distributed Ledger Technology with ISO 8000 Authoritative Identifiers and product data to address international trade and counterfeiting challenges	£126,188	£88,332

Project description - provided by applicants

When any UK business imports or exports goods, it is a requirement to identify the applicable tariff codes so that the correct amount of duty can be collected. Failure to use the correct codes results in import delays, greater administration and possibly lower duties being collected.

The future requires stronger but frictionless land, sea and air border controls based on access to trusted and authoritative data about vehicles, ships, aircraft and their cargoes. Twenty-six different government organisations have an interest in the operation of the border. Assigning the correct tariff codes will become ever more important. The National Audit Office (NAO) predicts Brexit will result in a five-fold increase in customs transactions; 130,000 UK businesses will be drawn into new border control processes.

The HMRC has an online look up and email service to help users identify their correct tariff classifications. Users have expressed concerns regarding possible increased classification errors resulting in import/export delays.

Counterfeiting of products is a global challenge. The International Chamber of Commerce estimated up to 2.6 million jobs were lost globally due to counterfeiting in 2013\. EUROPOL estimate counterfeiting impacted 5% of EU imports in 2013, valued at approximately $85 million. Products infringing intellectual property rights (IPR) now originate from virtually all geographical areas and economies globally, constituting up to 2.5% of all global trade, worth up to $461 billion in 2013\.

This R&D project will use Artificial Intelligence, Blockchain technology and ISO 8000 compliant digital data to automate tariff classification and ensure all parties have an authoritative trusted source of data. Resolvable identifiers for product data will follow the physical products through the supply chain using resolvable Authoritative Legal Entity Identifiers to help eliminate counterfeiting. This R&D project will extend an existing software system from KOIOS that currently enables businesses to create ISO 8000 product specifications.

The technology will provide:

* Automated mapping of tariff codes;
* Data provenance - verifying data history through its life cycle;
* Pre-notification of goods adding an additional intelligence layer for HMRC;
* Creation of a risk ranking for trusted traders and routes;
* Efficient targeting of HMRC resource to consignments that pose increased risk;
* Supply chain security using smart contracts;
* Reduction in IPR fraud in the fast growing digital economy;
* Increased productivity for all parties.

The technology will benefit:

* Importers;

* Exporters;
* Manufacturers and Producers;
* Customs and Shipping Agents
* Freight Forwarders
* HMRC
* Regulated sectors - such as Aerospace, Nuclear and Oil & Gas

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SYNAPTEC LTD	Renewable Energy Array Cable and Termination Instrumentation using Optical sensor Networks (REACTION)	£164,409	£115,086
OFFSHORE RENEWABLE ENERGY CATAPULT		£70,034	£70,034

Project description - provided by applicants

Offshore wind power generation is subject to harsher environments than onshore wind, imposing greater challenges on the reliability of critical infrastructure. Of particular concern are subsea export and intra-array cables, failure of which can lead to significant loss of generation and repair costs. In offshore wind farms, such failures are reported to account for 75-80% of the total cost of insurance claims, while total cabling expenditure accounts for only around 9% of the capital cost of a new windfarm. Significantly enhanced protection and monitoring systems are required to ensure robustness of these key assets and minimise lost generation in the event of a fault, but no existing instrumentation solution provides the required visibility at low cost to implement such a system.

This project will deliver the required innovative solution, built around unique photonic sensor technology developed by UK SME Synaptec Ltd, enabling for the first time cost-effective distributed electrical instrumentation of offshore systems. The technology will enable robust differential protection schemes to be deployed on array cabling for immediate identification of the affected section in the event of a cable fault, significantly reducing associated generation downtime and loss-of-revenue. The wealth of information leveraged using this technology can further be used for harmonic measurements, which can be used to identify cable resonance conditions known to weaken insulation. Combined with compatible fibre-optic temperature measurement on known points of failure to detect hotspots, this would enable for the first time prediction of cable failure on an integrated platform, allowing swift contingency actions to be taken to reduce the risk of failure or plan ahead for repairs, enabling lifetime extension through targeted maintenance.

ORE Catapult will contribute engineering and market expertise, and enable Synaptec to test the subsea cable monitoring/protection platform developed in this project in a realistic environment on OREC's 7MW test turbine in Levenmouth, Fife. Logging of measurement and system data during the trial will allow the long-term stability of Synaptec's sensors installed in offshore environments to be assessed for the first time. Synaptec and OREC will examine this wealth of data to determine what ancillary information can be obtained beyond basic faulted cable detection functionality, e.g. power quality measurements and failure prognostics based on harmonic information. OREC will leverage its expertise in and contacts throughout the offshore renewables sector to produce a commercial case and organise stakeholder workshops to ensure the technology developed by this project accurately addresses the industry need.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
THERMOELECTRIC CONVERSION SYSTEMS LIMITED	High capacity thermoelectric cooler unit	£412,560	£288,792

Project description - provided by applicants

Management of the temperature of electronic systems is becoming increasingly important as society becomes more and more dependent on the communications and transport infrastructure they support. Often outages caused by "signalling problems" on the railways or "service unavailable" in mobile phone systems and home broadband can be traced to overheating (or freezing) in the enclosures where the electronics is housed. More generally, operation at a reduced temperature ultimately improves the long-term reliability of the electronic systems.

This project aims to exploit recent performance improvements in thermoelectric semiconductor materials used as heat pumps to bring to the market high capacity cooler units for use with such electronic enclosures. To do this we need to take the basic thermoelectric modules and engineer a system around them that is cost effective and performant. The project will develop the key technology areas to enable this: the heat exchanger unit and the electronics & control algorithm which will drive the heat pump in such a way as to maximise its performance at the system level. Thermoelectric heat pumps are unique in that they can pump heat in either direction and thus the same device can be used for heating or cooling purposes without any hardware or software changes.

As the disruption to society caused by IT & electronic systems failure become more widespread and less acceptable, manufacturers of such systems are starting to address reliability issues and assure product performance under extremes of weather conditions. By having a suitable temperature regulation product available we will be able meet the growing market demand for such a device. The same unit can also serve as a dehumidification unit or as an conventional air conditioner.

In the longer term we anticipate the technology will benefit from economy of scale and the cost of the chiller unit will bring it to within range of the domestic cooling market (fridges, air-conn, etc). This will enable us to displace the vapour compression / expansion systems currently in use with a refrigerant-free system (with attendant environmental benefits). Thermoelectrics have an incredibly long lifetime - many decades - and this coupled with low running costs will generate significant market pull for such cooling products.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
KRAYDEL LIMITED	Novel sensor algorithms for elder care	£295,506	£206,854

Project description - provided by applicants

As society ages, more health and social support is needed from people's immediate network of family and carers and from government agencies. A number of technology-based solutions are becoming available to address the problems of isolation and health and wellness monitoring but are not achieving widespread adoption because: 1) Most products are based on tablet and smartphone approaches which our studies have shown are unusable by most elderly people. 2) Many home / health monitoring products require multiple separate devices which people find too complex.

Kraydel is different because it consists of a simple hub that clips to the top of the TV and a remote control with only 3 buttons. The Kraydel hub houses sensors for temperature, light, sound, and motion to monitor the activities of daily living, to support elder independence and wellbeing. Early trials have shown that the system helps to maintain and improve quality of life for the elderly using the Kraydel IoT-based system and social engagement platform accessible through the TV. An audit trail is created to record Kraydel interactions, so it will be evident (to families) if face-to-face visits reduce unacceptably.

This project will develop the tools to connect the user to important "supporters" such as family, carers, etc by generating messages such as "Mum's day has started" or "the Carer has logged in -- would you like to talk to them?" which are generated using sensor data. We will then work to evaluate and produce evidence to demonstrate how Kraydel's automated help and alerts reduce the concerns of the User's carers (e.g. friends, family and professional carers). We also address loneliness and social isolation using a camera to support better communication and connectedness between the independently living elderly person, and their ecosystem of care / support. We plan to work with our social care and academic partners to achieve a higher quality of life for older people, at scale, with our novel user-centric approach.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
VALERANN UK LIMITED	Investigation into the effectiveness of road surface level lighting as a road risk warning tool	£73,606	£51,524
Highways England		£0	£0

Project description - provided by applicants

The UK primarily relies on its road network for population mobility: 64% of all trips made in the UK in 2016 were by car. While road injuries have been decreasing, road fatalities have stagnated around the 2010 level. There are still almost 190,000 injuries and fatalities per year. To ensure further falling casualty rates, it is imperative to both make the road network as safe as possible and to improve driver skills and attitudes. This project focuses on the infrastructural needs to make roads safer through improving both visibility on the road and offering an affordable technology for better road network management.

Current active traffic management systems are able to reduce congestion hours by 20% and accidents by 35%, yet due to their high cost (up to £750,000 per miles) they are rarely used: 95% of UK roads are not monitored at all. This project will support the development of a unique technology that resolves this problem by transforming common road safety markings (road studs) into smart connected devices, which monitor and manage road traffic in real time. These smart studs, designed and developed by Valerann, offer a step change in the ability of policymakers and traffic managers to monitor road systems in terms of both coverage and affordability.

This project will support the development of a unique technology that solves this problem by transforming common road safety markings (road studs) into smart connected devices, which monitor and manage road traffic in real time. These smart studs, designed and developed by Valerann, offer a step change in the ability of policymakers and traffic managers to monitor road systems in terms of both coverage and affordability. Specifically, this project will investigate the impact road stud lighting can have on warning drivers about road risks through the use of driving simulation.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
HORIZON TECHNOLOGIES CONSULTANTS LIMITED	Ground Exploitation Station for Satellite Based L and X-Band Monitoring for Improved Search & Rescue / Detection of Illegal Maritime Activity	£476,736	£333,715

Project description - provided by applicants

Globally, 90% of world trade is transported by sea. This attracts groups seeking to profit illegally through piracy, illegal fishing and trafficking in illicit goods. Around 17 billion tonnes of goods are imported into the UK every year, so illegal activity has a negative impact on the economy and the 600,000 UK jobs that directly depend on maritime trade. Consequently, the UK Government works in partnership with other nations around the world to reduce the impact of crime on this valuable trade.

The SOLAS convention requires that all international vessels over 300 tonnes are fitted with Automatic Identification Systems (AIS). AIS data can be gathered by satellites, providing the positions of 100,000's of vessels globally and in real time. Criminals and pirates will disable AISs to avoid detection by coastguards. However, when a satellite phone is used, the GPS position of the handset can be detected using suitably equipped aircraft. If a handset is in use where there is no AIS data, illegal activity is likely taking place.

Horizon Technologies has developed unique capability in gathering satellite phone handset location data and our technology has already saved the lives of approximately 20,000 migrants and proven successful in the detection of criminal activity. However, aircraft deployment is expensive and results in less than 1% of global waters being monitored at an estimated cost of £100m per annum. Furthermore, sat phones may not be used.

We therefore established a collaboration with Spire Global to launch our technology on their small, low earth orbit satellite, starting in 2019\. In addition to Sat Phone location, we will be able to geolocate all maritime X-band radars (which no ship turns off risking collisions). This project aims at developing the Ground Exploitation Station, where all data from the 'CubeSats' will be gathered and processed, delivering vessel localization and tracking on a global scale. As such, the ground station is the crucial enabler of the whole system and successful completion will deliver a totally unique UK solution to the problems described above.

This project will transform our business, generating cumulative net revenues of £42.7m after 5 years (\>10x ROI) and creating over 70 skilled UK jobs and will play a valuable role in further developing UK engineering capability, support business diversification and provide excellent opportunities for export, economic growth and job creation.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
AMETHYST RESEARCH LIMITED	Ultra-High Performance Narrowband Detectors for Decluttering Stand-Off Sensing	£169,883	£118,918
Lancaster University		£130,990	£130,990
M-SQUARED LASERS LIMITED		£137,655	£82,593

Project description - provided by applicants

There is a significant need for technology that is effective in remotely detecting, identifying, quantifying and monitoring chemical emissions at ultra-low concentration levels in real world cluttered environments, such as toxic gases and chemicals, fugitive emissions and chemical weapon agents.

This program will deliver a highly disruptive, versatile, sensitive, standoff chemical imager, using a novel ultrasensitive narrowband detector that provides several orders of magnitude improvement in detectivity over any currently available solution.

The detectors will be integrated in M-Squared Lasers (MSL) Firefly instrumentation, enabling a full system demonstration of active hyperspectral imaging that will push the state of the art in terms of unprecedented sensitivity and target discrimination. The system will provide the necessary advancement that is required for the practical implementation of remote sensing and imaging at a useful stand-off distance.

The project team includes a specialist infrared detector technology company (Amethyst Research), a science provider (Lancaster University), and an established system integrator (M-Squared Lasers); a focussed supply chain that is equipped to deliver both innovation and commercialisation.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ACTIVE NEEDLE TECHNOLOGY LTD	Investigation of novel pain reduced tattooing machine utilising ultrasonic energy	£97,560	£68,292

Project description - provided by applicants

Active Needle Technology Limited "ANT" are the developers of a novel ultrasound needle "driver" technology that exploits the properties of ultrasonic vibration to aid the passage of needles through the tissues of the body. Crucially, the ultrasonic vibration is proven to reduce the needle insertion force and tissue trauma. ANT have developed a medical biopsy needle that must be inserted deep into the body to collect tissue samples for medical tests. The ultrasonic vibration not only eases the passage of the needle into the body, but also has the added benefit of improving the accuracy of tissue sample collection (reducing the deflection of the needle).

During development, ANT have noticed a numbing sensation of the active needle on the skin. In consultation with an expert in pain management, ANT believe the ultrasonic vibration interrupts nerve function in the skin therefore reduces the pain of the needle in the skin. Initial tests on un-optimised needles have shown that the effect is real. The business wishes urgently to evaluate the use of the active needle technology and leverage its expertise in ultrasonics to reduce the pain and trauma associated with tattooing. This enables the business to access a market with a potential value an order of magnitude larger that is order of magnitude larger than the medical biopsy market, but that is also important in reconstructive surgery, e.g. addition of a false nipple following post-surgical resection of the breast. This application enables ANT to:

* Research and develop a functional prototype active needle enabled tattooing machine;
* Conduct to key body of tests:

1. One: using human volunteers to determine if the machine is less painful that conventional tattooing methods;
2. Two: In consultation with tattooing artists, determine if the Active Needle tattooing machine is acceptable to tattooing artists.

This project enables the applicant to access a huge global potential market that is estimated to be worth approximately $1.6 bn p.a. in the US alone.

The innovation in this project: current tattooing machines operate at low frequencies (similar to the flicker rate of a fluorescent lightbulb) and oscillate back and forth by a few millimetres into the skin. This innovation is to introduce a very high frequency (i.e. beyond the rage of human hearing) micro oscillations hundredths of a millimetre) in the needle to ease the passage and reducing the pain felt by the tattoo recipient.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
MO-SYS ENGINEERING LIMITED	Translating Advanced Camera Tracking Technology to High Precision and High Reliability Indoor Navigation Sensing Enabling More Applications for the Growing Robotics Market	£354,798	£248,359
University College London		£145,000	£145,000

Project description - provided by applicants

Mobile robotics have already changed the face of industry. By moving materials and products in an automated manner, they offer efficient and cost-effective ways to store and manage the flow of products through many industrial activities.

Automated Guided Vehicles (AGVs) are used for this purpose with minimal human intervention. Amazon, in particular, are using AGVs extensively within its warehouses to speed-up the collection and shipping of goods.

However, to be able to carry this out well, the robots must know where they are (localisation), where they need to go, and to move in such a way that the materials are safely transported and are not damaged (control). AGVs use a range of guidance systems to do this. These range from simple wire, tape, or magnetic systems to more complex inertial, laser target, or Simultaneous Localisation And Mapping (SLAM) systems.

For simple, repetitive motions, and for open environments that remain largely unchanged, wire/tape and other guidance solutions are usually adequate. However, where the factory environment is difficult (e.g. complex pipework) or when high-precision is required for coupling/joining of containers or parts, and particularly in safety-critical environments with dangerous chemicals, most current AGV solutions fall short in terms of accuracy, reliability, and functionality.

Mo-Sys has developed a world-leading camera positioning and tracking system for use in the media industries. "StarTracker" is an upwards looking visual sensor that orientates itself relative to randomly applied reflective stickers. The method is matured, patented and used for over three years in TV green screen studios. It is robust, immune to contrast changes, and can work in darkness.

It is the intention of this project to develop this technology, primarily in the areas of accuracy and control, for AGV applications. It would not require any floor-based guiding systems or laser scanners that try to recognise a position within a dynamically changing environment. Once the stickers are on the ceiling, all objects refer to the same world and can collaborate in a smart factory. StarTracker would be able to guide an AGV robustly and precisely within an unlimited indoor area.

Aside from benefits in cost, time, and productivity for the relevant industries, it would have numerous wider benefits in terms of reducing human error, increasing safety in hazardous environments, and removing humans from monotonous tasks in to more value-added activity. The technology also has the potential to trickle-down in to healthcare, domestic and other robotic applications.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SPECTRA ANALYTICS LIMITED	Spectra Analytics - The Artificial Intelligence Factory	£490,932	£220,919

Project description - provided by applicants

The amount of data that we are collecting has increased exponentially, driving a new world quantum of data storage. This has left many businesses with information overload, making it difficult for them to operate and to achieve a Return on Investment (ROI).

How can companies harness this data to inform decision making and drive business growth? The answer is data science. Data science -- or data analytics -- is the application of mathematical and statistical modelling, and machine learning / artificial intelligence (AI) to extract insights from data to inform -- and possibly automate -- processes and decision making.

Companies have Big Data Plans, but they are realising they also need a Data Science Plan. IDC estimates that the big data and analytics market will grow to $203bn by 2020 - doubling from 2015 -- and Gartner estimates the business value derived from AI will be $5trn+ by 2025 with Decision Support/Augmentation growing by 44% to 2030\.

Unfortunately, building a Data Science team is extremely difficult and expensive. PWC found a large and increasing demand for AI/Data Science skills -- increasing by 40% over the next 5 years - but due to the advanced level of skills required there are few qualified practitioners.This preventing companies from delivering cutting-edge solutions. This presents a large and growing market for data scientists and AI product development.

To address the need, Spectra Analytics ("Spectra") has developed a disruptive new business model, the "AI Factory". A specialist AI/Data Science firm that allows companies to outsource and/or partner to develop AI solutions.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
TENDED LTD	Tended Commercial	£493,299	£221,985

Project description - provided by applicants
Tended is a personal safety technology start-up which develops intelligent systems and accident detection wearables to improve the safety of lone workers. The Tended Commercial project is being developed to support the 6 million lone workers in the UK and to provide employers with an all-round, effective safety solution for both mobile and site-based employees. Using Bluetooth mesh technology and AI-powered wearable devices to detect accidents with high precision, Tended Commercial's systems can immediately send for help when an employee needs it most, reducing post-accident response time. The project will also contribute towards employers' legal and moral obligations for ensuring employee health and safety at work, not only in the UK but across Europe and the rest of the world. It is an innovative project and one that will fill a huge gap in the market as existing lone worker solutions are associated with limited functionality, high costs and likeliness to send out false alarms and are therefore seldom implemented in businesses. With this project, Tended will develop a highly-beneficial solution that employers can easily integrate into their systems to improve workplace safety and offer lone workers peace of mind when carrying out their tasks. Tended is working with some of the largest companies in the UK from a variety of different industries to ensure the solution developed over the next 18 months is perfectly suited for commercial applications, providing businesses with significant financial, regulatory and ethical benefits.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

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
Createanet	Live Visualization of Emission - Towards Informed Avoidance of Pollution Hotspot (LiVE-TAP)	£210,418	£147,293
Coventry University		£133,994	£133,994
EARTHSENSE SYSTEMS LIMITED		£136,717	£95,702
Leeds Beckett University		£13,999	£13,999
Wolverhampton City Council		£0	£0

Project description - provided by applicants

MAIN DEFINITION

School-Run-Routes: Streets commonly used by pupils and accompanying adults as routes to primary schools

SUMMARY

Poor-air-quality is the largest environmental-risk to public-health in the UK, causing tens-of-thousands of early deaths and billions-of-pounds in health-impacts yearly (Parliament-business,2018). Emissions contribute to 40,000 premature-deaths yearly, and contributes to heart problems, dementia, diabetes, cancer, asthma and stroke(Royal-College-of-Physicians-and-of-Paediatrics-and-Child-Health, 2018). Its annual cost to UK economy is £62bn (World-Health-Organization).

Emissions effect can be devastating in highly frequented outdoor places like city/town-centre, highstreets and school-run-routes. For examples (a) Most UK city/town-centres, including 44 of the 51 listed in WHO's quality database, have over the limit emission levels causing millions of people to inhale dangerous-air (WHO,2017) (b) Cars on school-run-route cause damaging pollution to the 51% of pupils who walk to school with an accompanying adult; Ella recently died from such pollution, with doctors clearly saying use of less-polluted-alternative routes to school would have saved Ella(BBC,2018).

Present ways of predicting pollutant-emissions through estimation of vehicle numbers on roads are inaccurate because emissions-per-vehicle data are unreliable, as evidenced in the recent Volkswagen scandal. Monitoring stations on the other hand give average values for large-areas (e.g. neighbourhood, district, town etc.) over a period (usually monthly), with results published after taking samples to laboratory. The results only inform and cannot help citizens to make eco-healthy pollution-avoidance-decisions.

This project thus aims to develop a holistic system which communicates 'accurate' live-emission-data of city-centre-streets and school-run-routes to citizens through digital means including mobile-phone apps. This will allow citizens/users to decide when (not) to use certain city-centre-streets/school-run-routes, **or which ones (not) to use** (i.e. avoidance behviour), based on emission levels. This will help to greatly reduce the amount of emission inhaled by users and divert traffic away from highly polluted areas thereby reducing pollution. The acquired data will also be used to predict future-emission-levels to allow eco-healthy planning and inform local-authority policies

The system will include

i) Internet-of-Things sensors installed on city-centre-streets and school-run-routes to accurately measure key pollutants like NO2, CO2 and PM2.5s

ii) Mobile-phone/computer apps to directly relay live-emission-levels data to city-centre-streets and school-run-routes users and stakeholders using heat-maps on digital-geographic-maps.

iii) Cloud-storage, big-data-analytics and machine-learning-algorithms used with acquired data to predict future-emission-levels to allow eco-healthy planning

and inform local-authority policies

iv) Emission-data-as-service to tour/trip/route plan providers (e.g. Tour-Planner, Google-maps,etc.) for improving their services.

v) A crowdsourcing-platform hosted for future installers of IoT emission sensors to sell their data through Blockchain-Technology.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FUNGIALERT LIMITED	Increasing agriculture productivity and sustainability through the use of disruptive sensors and software, to facilitate game changing and cost effective soil-health analysis within agriculture	£199,377	£139,564

Project description - provided by applicants

FungiAlert is developing game changing technology within agritech that will increase agricultural productivity and sustainability through the development of disruptive in-the-field sensors. The objective of this project is to create a new product and make soil-health analysis more accessible to growers. The new offerings would ultimately allow growers to make informed agronomy decisions to mitigate crop loss due to crop disease. This would have a huge impact on the UK economy, as crop diseases within the UK can account for losses of up £2.4bn per year, highlighting the need for disruptive technologies to promote soil-health analysis, for increased crop yields.

To date, FungiAlert has developed the first early detection device for fungal plant diseases from soil and water. Other soil-health diagnostic methods offer post-symptomatic identification of the disease. This late diagnosis is not always useful, as once the disease is symptomatic, the treatment is not efficient and crop losses are inevitable. FungiAlert's technology can be described as the smoke detector for farmers, since it alerts the user about the risk of infection before the disease spreads and causes devastating losses. FungiAlert's current technology detects fungal and oomycetal pathogens, however, the market is also demanding a product than can simultaneously detect multiple types of microorganisms within one sensor (i.e. fungi, oomycetes and bacteria). This is due to existing devastating bacterial diseases in agriculture, such as as _Xylella fastidiosa_ which is destroying grape and olive crops in Europe and is threatening the oak trees in the UK (Ian Cox, Innovate UK blog 2018).

Like personalised-medicine, different species of plant pathogens have different susceptibility to pesticides, therefore, there is a need to precisely identify the species of disease, in order to tailor pest management strategies. Currently, FungiAlert offers a genomic approach to identify the species of diseases detected by the sensors. The new proposed sensor will have a wider detection scope, therefore, there is a need for a cost efficient metagenomic approach. This would provide soil-health analysis of the microbial community at the point of sampling in the field, this would be game-changing for agriculture, as it would help guide key agricultural decisions (rotational decisions, variety selection, crop protection strategies, harvest time etc.).

This project would allow FungiAlert to offer game changing and cost efficient technology for soil-health analysis, revolutionising agricultural practices, and increasing crop productivity and promoting sustainable farming.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CARBON8 SYSTEMS LIMITED	Towards a circular economy: carbon utilisation and waste valorisation	£256,486	£179,540
WRIGHT BROTHERS INDUSTRIAL SERVICES LIMITED		£55,016	£33,010

Project description - provided by applicants
This project combines market feasibility and industrial research to develop an innovative solution for on-site waste valorisation and carbon capture and utilisation.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
MOLEY ROBOTICS UK LIMITED	The Moley Robotic Kitchen	£433,829	£260,297
SCHUNK INTEC LTD.		£61,622	£22,184

Project description - provided by applicants
In May 2015 Moley Robotics revealed its Robotic Kitchen: the world's first fully automated and intelligent cooking robot. Launched at the Hannover Messe trade-show in Germany, then presented at the world's biggest consumer electronics show, CES (Shanghai), the system mimics the actions of a master chef precisely, bringing a variety of dishes cooked to world-class standards to the domestic and commercial kitchen. This project aims to address the technical and commercial limitations of the current demonstrator. While it successfully proved feasibility, the modules used were too bulky or expensive for a volume product. Key elements not required in feasibility will be developed. Moley is taking tried and tested robotics beyond the factory floor and into kitchen refurbishments, residential new-builds, restaurants, hotels and age-care facilities. By launching a dramatically cost-reduced and feature enhanced Robotic Kitchen at CES2020 in Las Vegas and then beginning its commercialisation plan, Moley will be able to begin addressing the immense global market opportunity for a true robotic cook so people can eat healthy and freshly cooked food, time and time again.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
PANACEA RESOURCE SOLUTIONS LIMITED	Panacea PM2020 Internal Combustion Engine Efficiency and Pollution Reduction Innovation System	£457,758	£320,431

Project description - provided by applicants
Panacea Group are an innovation led SME, providing energy, waste and water efficiency solutions to corporate clients. See [www.panacea.london][0]for more information. The proposed project will see the development of an innovative and disruptive compression-ignition engine solution known as PM2020, that works to improve fuel economy by more than 5% and reduce particulate matter by 35-65% in diesel and biodiesel fuelled engines. This will massively support initial target sectors, including power-generation and shipping sectors to meet incoming regulations, reduce fuel costs and reduce the human health and environmental impacts of their activities. Innovate UK funding will help convert PM2020 into a hardened manufactured product, bringing it to the brink of commercial deployment through further prototyping and road testing. Panacea has a talented team in place to deliver the project alongside distribution channels that provide a direct route to market. This project will make PM2020 an innovation that is ripe for equity investment to globalise this exciting technology. [0]: http://www.panacea.london/

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
LASERWELD PLASTICS LTD.	New manufacturing methods for coated textile products (improving performance, productivity and profit)	£60,042	£42,029
TRANS-MODERN ENTERPRISES LTD		£47,553	£33,287

Project description - provided by applicants
The wearable shelter, a one-man tent and waterproof jacket has been developed by Zelter to provide a weight saving alternative safety product to a tent and waterproof jacket. The product has already seen commercial sales in the outdoor product and military markets. It incorporates a number if innovative concepts including the use of inflatable support in place of poles to reduce weight and for ease of carriage, as well as the ability to convert it into a waterproof jacket through use of studs and zips. Currently construction uses manual stitching and RF welding, which makes manufacture in the UK difficult due to labour costs and limits design flexibility. This project will develop and assess use of laser cutting and welding to produce a demonstration product and provide the information required for automated production equipment to be designed and installed.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

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
DIAMOND CENTRE WALES LIMITED	Innovative Jewellery Manufacturing Process using 3D Printing (JewelPrint)	£311,895	£218,326
University of Sheffield		£128,893	£128,893

Project description - provided by applicants

The aim of this project is to conduct the techno-economic feasibility roadmap for the 3d-printing of precious metals to manufacture jewellery (JewelPrint).

Today, the UK jewellery sector is worth £6bn and achieved 6% growth in 2017\. In summary, the jewellery manufacturing sector, is a key pillar of the UK economy.

Jewellery manufacturing involves a challenging, lengthy, multi-stage, inefficient complex process. It includes design steps, creating a mould which in-turn is used to make wax reproductions, casting of the jewellery followed by polishing/finishing. Most of these steps have barely changed over decades. There are several limitations associated with these processes: accuracy of casting, porosity/voids, high-cost precious metal waste in casting and finishing. Further, there are costly labour fees associated with manufacturing.

The first signs of established jewellery making was in Ancient Egypt communities, ~ 3000-5000 years ago, where they preferred the luxury, rarity, and workability of gold over other metals. Jewellery is associated with key social occasions, with emotional and sentimental value attached since products are often linked to key life events such as births, weddings and anniversaries. This association is unlikely to ever change.

Our project, JewelPrint, will create an innovative 3-d printing technology to produce high quality parts with improved efficiency, resolution, surface-finish, reduced warpage and thermal stresses and open-up the market for 3d-precious metal printing in jewellery manufacture.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
METIS LABS LIMITED	Metis Labs Intelligent Control	£454,842	£318,389

Project description - provided by applicants
Huge inefficiencies exist in the manufacturing sector due to suboptimal control of production processes. Metis Labs is using artificial intelligence (AI) and cloud computing to develop a new form of Advanced Process Control (APC) which is perfectly suited to the needs of the new wave of digitised factories coming online. This will be easy for industrial engineers to install and maintain, and flexible enough to use in a diverse range of factory environments.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
LOW SULPHUR FUELS LIMITED	Fast-Electrochemical Process Pilot Unit Project	£499,298	£279,607

Project description - provided by applicants
Low Sulphur Fuels Ltd. small team of British engineers and chemists have developed a new technology that should make significant changes to the way the oil, shipping and energy industries use less energy while at the same time substantially reduce their emissions to the environment. The process uses advanced electrochemistry to modify the molecular structure of hydrocarbon-based waste materials (oils, rubbers, plastics) by allowing unwanted contaminants (sulphur, metals, chlorine, etc.) to be extracted by a low cost, near zero emission process. The outputs are cleaner new fuels (that are required to be used by the shipping industry to meet current and future worldwide emission regulations) for agricultural machinery, for energy generation or domestic heating. In the oil industry, scaling up the process could provide a massive cost and environmental saving as an alternative to high cost, high emission, energy consuming processes such as hydro-treating. An additional major potential benefit is the ability to remove chemical effluent from industrial waste water streams, which transforms the water into a chemically clean resource for irrigation/industrial use or clean disposal. This could be a major environmental advantage for the Upstream O&G industry when using 'fracking' tailing ponds, tar sand or heavy oils.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ECOIDEAM LIMITED	Removal of BioPlastics from mixed polymer waste flows for chemical recycling	£149,134	£104,394
IMPACT LABORATORIES LIMITED		£143,972	£100,780

Project description - provided by applicants
BioCycle has been created in order to solve a present, but growing problem with the introduction of bio-based-plastics (both biodegradable and bio-derived-plastics). While they are marketed as "compostable", this can only be done in specialist facilities, and to do so, the bio-based-plastic must be separated from the conventional plastic. There is currently no technical solution to this. With the bio-based-plastic market expected to increase by 50 fold over the next 12 years, it is crucial for the industry to find a solution to this problem, to prevent a large majority of waste plastic packaging ending up in landfill. BioCycle is a disruptive approach to this problem. Working with the anaerobic digesting (AD) industry, of which lead partner EcoiDeam (EI) are a management provider and the route to market for this project, we will explore the feasibility of a high shear, enzyme wash system, designed to remove the bio-based-plastics from the conventional plastics which are a waste product of the AD process. EI will work with Impact Solutions (IS), a leading plastic testing and research & development firm, who have a track record of successfully developing and commercialising recycling technologies, and who have a growing portfolio of inventive technologies. Both partners already have a working relationship, and are ideally placed to develop this technology.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
E FUNDAMENTALS (GROUP) LIMITED	EFundamentals: A novel AI solution to evaluate and identify online sales of counterfeit goods	£478,273	£215,223

Project description - provided by applicants

Substandard, spurious, falsely labelled, falsified and counterfeit goods are a significant global challenge with a market value reaching $1.7trillion in 2018\. ~5% of goods imported to EU are fakes, largely originating from middle-emerging countries, with China the top producer. Counterfeiters hurt big companies, large pharma, luxury goods manufacturers and take advantage of consumer trust in trademarks and brand names to undermine economies and danger lives. The wider economic effect of fake branded goods removes €8.1B/year in revenue from Europe's government. It is however a market challenge that all regulatory authorities are failing to address.

The key to addressing this global challenge is greater intelligence around identification&evaluation of sites selling counterfeit, fake&illegal products. Current initiatives to detect such products include prevention through labelling/authentication (complex technology, requires product understanding) with best-in-class intelligence for the sites, data harvesting tools (Data-as-a-Service), only providing insight of target websites, large data output with many law enforcement agencies relying on retrospective manual searches. No reliable solution is yet available that can deliver real-time insights, gather prosecution evidence, display site content and evaluate legitimacy/authenticity of online products.

Addressing this gap, EFundamentals to date have successfully developed and proven a proof-of-concept prototype (IUK funded project) software solution able to identify, harvest globally and authenticate all online sites and their products in real-time. This includes information on URL's, domains, site owners, delivery methods (e.g. DHL), payment methods, prices, suppliers and images of products. This has been achieved by using the EF 'Discover', 'Gather' and 'Extract' technology concepts combined with unique software algorithms to eliminate 'false positives'.

This project aims to further this to:

1.Advance the crawler and gather technology employing machine learning and AI to automatically capture and record website data delivering a polished UI /UX 'self-service' commercial product for the reporting of illegal sites and drugs products for pharmaceutical companies, law enforcememt and regulators to evidentiary standard.

2.Extend this technology to identify, interogate and report on illegal goods such as luxury items, software and commodities (e.g. printer inks), the sites that sell them and a detailed dashboard, providing 'Brand Protection' services.

EFundamentals are well place to exploit this opportunity as they have already commmercialised their sales-building, profit-driving, insight engine for FMCG products.

With Innovate UK support, a 12-month programme of experimental development is require to advance both these initiatives to a commercial prototype before fully validating the solutions in trials with confirmed trial partners to commercialise in 2020\.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SURFACE INTELLIGENCE LIMITED	InkTracer - Closing the gap between analog and digital handwriting to enable new products	£156,671	£109,670
Loughborough University		£67,013	£67,013

Project description - provided by applicants

Writing has a very long history. It began as simple pictographs drawn on a rock, which were then combined to represent ideas and developed into more abstract symbols. Just like our writing today, early symbols were used to store information and communicate it to others. We may take it for granted, but the written word has shaped our modern civilization and we will have a natural affinity with pen and paper for a long time to come. Taking down a phone message, sketching ideas on a notepad, leading a class on a whiteboard, or signing a mortgage - handwriting remains a part of our daily lives. Despite modern technology, important information is still recorded in ink on paper or marker on whiteboard, which is hard to share, easily lost, and difficult to navigate.

Touch screens and digital pens have become commonplace, enabling workflows that include digital ink and handwriting recognition. These advances allow us to write and take notes as we have since childhood, but still benefit from data that can be interpreted by a computer. We can search for text, archive and index our notes, and even go back and cleanly edit the original. These advantages are not available to handwriting on paper or a whiteboard - we can take a photo or make a scan, but computers are unable to interpret the information in a scan of a handwritten document as effectively as they can from digital ink.

In this project Surface Intelligence and Loughborough University will work together to develop a solution that will close the gap between analog and digital handwriting. By employing cutting edge machine learning techniques, we will develop a solution to recover the path of a pen from a picture of the writing. Converting an image of handwritten text to digital ink will allow us to enjoy the benefits of modern workflows without disturbing the advantages we enjoy when using pen and paper or marker and whiteboard.

Surface Intelligence will work in partnership with Wacom to bring this solution to the market. Wacom are world leaders in graphics tablets and digital pens with forward looking cloud services for digital ink. They are very well placed to advise on requirements and to partner with Surface Intelligence to provide a sound commercial proposition and route to market.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SKILLZ MINER LIMITED	Skillzminer	£481,797	£337,258

Project description - provided by applicants

Our vision is to improve social inclusive growth and boost productivity via our digital concept called Skillzminer.

Our project will demonstrate how artificial intelligence, can better predict the skills, values and behaviours required to boost productivity today and in the future.

We want to apply machine based learning to our technology so that when we assess skills, values and behaviours at an individual level and demonstrate the impact on social inclusive growth.

We will:

* Measure and predict the impact of Governmental regional investment and behavioural interventions
* Offer a scaleable solution that gives jobseekers and employees the ability to understand what their core competencies and how they might be developed and applied today and in the future

We will achieve this by:

* Engaging with a frequently overlooked and marginalised talent tool via a conversational assistant
* Identifying skills that can be transferred and evolved
* Developing 'next best' algorithms that predict what interventions job seekers require. This will allow us to stimulate behavioural change within job-seekers to reduce risk interventions
* Driving insight from our dataset which contains regional economic data, skills, values and behaviours
* Visualising opportunities for jobseekers, matching employer opportunities with jobseeker profiles and tracking job-seekers through their evolving career path

In doing so, we will help minimise welfare expenditure, reduce risk interventions and increase productivity within local economies.

The outcome of this industrial research will be a market ready scaleable solution to a growing market which includes Government, a National Employability and Training provider and a consortium of major employers.

The resulting data will provide tangible evidence of the effectiveness of the underpinning core technology, the sentiment analysis requirement and machine based leaning algorithms.

The proposed project is expected to run for nine months and cost £481,797\.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ARCHANGEL IMAGING LTD.	CopperGuard - AI-enabled metal theft prevention	£489,459	£342,621

Project description - provided by applicants

Archangel Imaging's project will employ AI-enabled camera systems to help stem the cost to business and the taxpayer of widespread metal theft. Around the globe, metals ranging from copper to steel (telecom, rail and power cables and infrastructure) are being stolen at an increasing rate; in the UK alone, it is estimated to be heading towards a £1Bn p.a. area of criminal activity.

In 2017 the price of copper leapt by 50%. The effect of this translates into a spike in copper theft (a global problem).

Taken on a global scale, metal theft is a significant and growing problem and normally it is the taxpayer who covers the cost. Safety is often compromised when criminals degrade rail network or power systems, even when no-one is hurt, the theft usually translates as inconvenience to the public due to communications failure, power outages or rail delays as repairs can often be time consuming and costly. The global market for systems to address the growing multi-billion p.a. metal theft situation is in the hundreds of millions of pounds. The proposed project will develop innovative, low cost technology to allow companies to better protect their valuable infrastructure; the technology easily translates into other areas such as the oil and gas sector, airport security, road safety, in fact wherever routine surveillance is undertaken.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SKYWELL SOLUTIONS LIMITED	Requench atmospheric water generator prototype	£173,930	£121,751

Project description - provided by applicants
Sustainable supply of water is No.1 in terms of Global risk based on societal impact with 1 in 10 lacking access to safe water. Global warming is already increasing the pace of desertification making solutions to the looming water crisis more costly. Requench capitalises on humidity which can be exacerbated by global warming to provide businesses and remote communities with a source of potable water where alternatives are non-existent or expensive. Requench works away from sources of liquid water so can be sited in regions which are remote, dry and or salt laden and generally considered hostile to life. Technology and processes used in Requench are proven, highly reliable and durable eliminating technical risk. There are no competitive products capable of operating using waste heat from diesel or gas fired generators giving the business a unique selling proposition.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BIOMECHANISTS LIMITED	Use of bioimpedance and machine learning to predict transplant organ viability	£159,760	£111,832

Project description - provided by applicants
This project addresses a critical health problem of global significance - the shortage of organs for transplantation. For the better part of four decades, human organ supply has not kept pace with demand. Currently only a small fraction of organs are retrieved from donation after circulatory death (DCD) even though this is the most common type of death. It is quoted that more than 60% of the hearts and lungs must be discarded annually. New technologies are desperately required to expand the much needed pool of transplant organs. We have identified a technology solution to assess and validate a patient's tissue (organ) viability and integrity. Our approach is disruptive and will: (1) afford quality organ harvesting; (2) expand the pool of 'much-needed' organs among donation from circulatory death; (3) reduce organ discard; (4) reduce financial impact upon healthcare systems; (5) enhance outcomes for recipient patients; and (6) facilitate research in an area that can save tens of thousands of lives annually.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FLUIDLY LIMITED	The development of an Automated Zero Touch Cashflow forecasting solution using Artificial Intelligence	£491,462	£344,023

Project description - provided by applicants

Cashflow is the lifeblood of all businesses. The accuracy of cashflow forecasting is critical to the identification of potential shortfalls in cash balances, ensuring that payments can be made to both staff and suppliers, enabling growth including access to finance and ultimately avoiding insolvency.

Despite trends towards improving cashflow management practices in the UK, the inability to manage cashflow effectively is still a significant cause of small business failure (50% of SMEs fail in their first five years of operation with 80% of failures due to cashflow issues), with \\\>42% of SME employers citing cashflow as one the biggest obstacles facing their business (BEIS, 2015). Key reasons for cashflow challenges include increased debtor days, inadequate credit control, late invoicing, and even poor accounting practices. The UK is not alone with a recent study of 1.8M SMEs across the EU and US identifying common challenges.

Despite being the foundation upon which major financial decisions are made, cashflow forecasting is a largely manual process based on historic P&L/sales data, averages and often flawed assumptions. With a greater level of transactions, this becomes even more challenging, with the use of existing modelling software offering only a marginal improvement compared to Excel.

Fluidly (a UK based SME) seeks to address the market gap for more effective forecasting solutions through the development of the first automated web based cashflow forecasting application that uniquely applies data science and machine learning to cloud accounting data (offering a level of granularity not currently possible, forecasting each nominal account line with a cash association), offering improved debtor management and prediction accuracy.

If successful, this disruptive solution will offer:

* Improved accuracy in cashflow forecasting to enable UK companies (initially aimed at SMEs, accountants) to track, manage, pre-empt cashflow issues for better financial control and enabling more informed financial decisions to be made.
* Accurate line by line forecasting in near real time - granularity currently not possible by human/manual analysis (predicting the likelihood of a payment being made to the day).
* Compatibility across any accounting package.
* Anomaly detection (threat/opportunities including fraudulent activity).
* Supporting start-ups to survive and scale through improved use of working capital, potentially reducing the need for external finance, or where needed aiding lending decisions.

The solution has global exploitation potential and offers future potential in logistical planning and energy demand/supply forecasting applications.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ACTION ARTIFICIAL INTELLIGENCE LIMITED	A Marketplace and Tool Suite for the quick creation and shared use of sophisticated Conversational Interface Language Classifiers.	£946,532	£425,939
WIREFAST LIMITED		£98,712	£44,420

Project description - provided by applicants
An Artificially Intelligent Conversational Interface (CI) is automated technology permanently on call for users via text or voice interfaces - accessed typically via Instant Messenger channels such as Facebook Messenger and voice channels like Alexa. CIs promise 24/7 automated, frictionless communication between users and businesses to enable quick, convenient task completion. Significant barriers exist for businesses wishing to benefit from commercial strength CIs. Software tools on the market are inadequate for developing commercial-strength CIs. There are also significant challenges collecting CI training data. These difficulties render it practically impossible to build CIs beyond prototype quality. This project's expert consortium aims to make it quick and inexpensive for enterprise development teams without expertise in AI to create sophisticated commercial-strength CIs. The delivered solution removes barriers to market entry, constituting game-changing models that empower enterprises of all sizes internationally. The consortium has deep expertise in machine-learning and commercial messaging integration across a broad business spectrum, and is positioned to design innovative technology that addresses CI creation challenges. Core elements of a Language Classifier Marketplace will be delivered in this project, enabling companies to use prebuilt, instantly configurable machine-learning language classifier templates to create high-quality CIs without machine-learning expertise.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CHIEF AI LIMITED	Chief AI - Global provision of AI As A Service	£330,161	£231,113
MEDICINES DISCOVERY CATAPULT LIMITED		£139,232	£139,232

Project description - provided by applicants

Chief.AI provides full-service AI brokerage and marketplace that aims to become the pre-eminent access point for artificial intelligence as a service (AIAAS) globally.

It achieves this by brokering global AI resources, channeling them on demand for metered consumption in a simple to use but secure and private marketplace environment. Chief.AI enables Plug-and-Play retail of global AI back-ends, served to business consumers across a RESTful API on a PAYG model.

Suppliers can readily connect AI services to Chief, which enables easy discovery, comparison and purchase of services. Businesses can search for the most appropriate service, purchasing it programmatically and consuming it as and when needed.

Services are organised by industrial sector, enabling sectoral businesses to discover and consume industry-relevant AI services with ease. Consumption, benchmarking, and real-time service feedback mechanisms enrich the AI experience across metrics such as algorithm effectiveness, efficiency and AI ethics scores.

Revenue is derived from transparent two-sided commission on service usage.

This is a paradigm changing way of introducing the businesses and developers to AI, from the current deployment heavy implementation via an easy to use and stable API.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SANDON GLOBAL ENGRAVING TECHNOLOGY LIMITED	Developing The Next Generation Of Anilox Rolls	£1,316,680	£921,676
Liverpool John Moores University		£396,431	£396,431

Project description - provided by applicants
Following on from a KTP project which commenced earlier this year, the principal objectives of which were to develop a bespoke Anilox coating material that provided unique tribological properties in terms of porosity, material density and hardness. The purpose of this industrial research project is to explore how we can best exploit the unique tribological properties and chemical composition of this material through the application of short pulse laser technology and beam manipulation to create a new generation of Anilox rollers that provide significantly enhanced operational performance in terms :- * Print Quality * Running speeds * Wear resistivity * Waste reduction

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
NOVOLAB LIMITED	RElease of Stains at Ultra Low Temperatures (RESULT)	£340,066	£238,046
CULIMETA-SAVEGUARD LIMITED		£100,103	£50,052
DEVAN-PPT CHEMICALS LIMITED		£103,206	£51,603
University of Leeds		£183,098	£183,098

Project description - provided by applicants
The aim of this project is to develop non-fluorocarbon textile finishes which prevent oil and water-based staining and reduce the average laundry washing temperature required to remove grease and dirt from soiled clothing without encouraging the growth of bacterial odour. The project brings together a multinational UK based, research focussed, global leader in sustainable chemicals, a large innovative UK based producer of textiles, one innovative SMEs and a leading UK university with a reputation for excellence in textile technology.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
VORTEX IOT LIMITED	PARSER: Parking and AiR pollution SEnsoRs for Smart Cities	£686,183	£480,328
BT LIMITED		£25,076	£12,538
City and County of Swansea		£10,352	£0
Swansea University		£255,653	£255,653

Project description - provided by applicants

PARSER is an industrial research project developing a scalable solution to the combined problems of urban parking and air and noise pollution. Cars travelling at low speeds while searching for parking spaces contribute greatly to congestion and pollution. According to the British Parking Association drivers take an average 5.9 minutes searching for a parking space adding up to an estimated 4 days per year.

On average 40% of UK Councils' revenue is generated through parking and each council is also being pushed heavily to demonstrate environmental policy monitoring tools as our cities and urban areas will witness major change and population shift over the coming 20 years. PARSER is a product we feel hits a genuine urban need that can also enable new and sustainable urban business models.

There is an inherent and pressing need to build new energy, transport and urban systems to meet societal challenges such as a growing and ageing population, urbanisation and the need to reduce carbon emissions. _With_ _more than 70% of people estimated to be living in urban areas by 2040, city infrastructure and design is going to need to drastically change to better support its citizens._

Emerging internet-of-things (IoT) technologies can offer the ability to sense parking occupancy, traffic flows, congestion and air quality on a hyper-local scale. However, there are significant challenges to combine the technologies and develop the machine learning classifiers to interpret the data. The project aims to develop a LiDAR based parking monitoring solution coupled with air and noise pollution sensors. Together the consortium partners, Vortex IoT, BT, Swansea University and Swansea Council, will develop and deploy prototype sensors to test sites in the Swansea City region. Vortex IoT will take the lead on developing the sensors and wireless networks, Swansea University will focus on machine learning while Swansea Council will provide installation services and access to BT's on-street WIFI across areas of the city centre as designated for pilot.

This project will deliver significant export led growth, a substantial ROI, increased employment and further opportunity for R&D investment for all consortium partners.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CAV ADVANCED TECHNOLOGIES LIMITED	ULTIMATE - Unconvensional Laser joining Technology for multI-MATErial products	£243,521	£146,113
AUTOTECH ENGINEERING R&D UK LIMITED		£122,053	£61,026
FAR-UK LTD		£262,329	£183,630
METAL IMPROVEMENT COMPANY LLC		£197,990	£118,794
METLASE LIMITED		£198,766	£99,383
TWI LIMITED		£435,630	£435,630

Project description - provided by applicants

Multi-materials assemblies are designed and joined together to achieve the best performance for specific applications and specific working environments. These assemblies combine the advantages of each material into an advanced structure, capable of working in heterogeneous and harsh conditions. Dissimilar material assemblies are highly functional, save material resources and enable significant weight reduction, which is fundamental for breaking down fuel consumption and CO_2 emissions (major targets for the transport industry).

However, joining metallurgically incompatible metal alloys or CFRP composites to metal alloys is challenging and often beyond the capacity of a conventional automated production processes. Currently, most challenging multi-materials assemblies are mechanically fastened and/or adhesive bonded. Limitations associated to using these two techniques include extra weight, cost and durability issues. These drawbacks limit the adoption of more advanced multi-material joining applications and reduce potential benefits of optimised designs.

Consequently, there is a clear need for new, flexible, cost-effective and rapid methods for joining dissimilar materials, capable of meeting industry performance and manufacturing demands. _ULTIMATE_ focuses on the development of an innovative technology to enable highly dissimilar materials to be fusion welded together using highly productive industrial processes. The _ULTIMATE_ project will primarily focus on dissimilar material combinations of interest to the transport sector, including dissimilar metallic materials, and composite to metallic material joints. Case studies and technology demonstrators will be produced for the aerospace and automotive sectors, although the technology has the potential to be highly versatile and applied to many different applications across other industry sectors.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
VISIONMETRIC LIMITED	Deep learning strategies for accurate identification from facial composite images (E2ID)	£341,367	£238,957
University of Greenwich		£24,099	£24,099

Project description - provided by applicants

Facial composite images of criminal suspects (commonly known as PhotoFITs or EFITs) are routinely used by police forces to assist their criminal investigations throughout the world. However, the effectiveness of facial composites as tools of criminal investigation is severely limited by the current inability to accurately and rapidly search a population for potential matches to a composite image. Existing commercial face recognition systems do not adequately address this problem and perform very poorly on facial composite images.

In this project, we propose a radical, new approach to achieving fast and accurate matching of facial composite images to police suspect databases. We will use methods of artificial intelligence and advanced image processing to generate the world's largest repository of facial composite images. We will then exploit this resource to develop neural (deep learning) procedures that successfully map the human cognitive processes implicit in the recognition of facial composite images. In this way, machine behaviour will be tailored for the first time to achieve composite face recognition in a way similar to human-beings.

The expected developments will give rise to improved investigative procedures for international police forces leading to greater case closure and significant efficiency increases. A successful project will pave the way to commercially exploiting this technology in policing markets all over the world.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
PHASE CHANGE MATERIAL PRODUCTS LTD	Innovative PCM Heat Storage Device for Control of Varroa Mites in Beehives (BeeSave)	£148,000	£103,600
E.H.THORNE(BEEHIVES)LIMITED		£122,000	£73,200
HEALTHY BEES LIMITED		£65,800	£46,060
PRIDOPIA LIMITED		£84,000	£58,800
University of Nottingham		£177,279	£177,279

Project description - provided by applicants
The proposed project aims to develop an innovative BeeSave device to kill Varroa mites in beehives. The device uses a phase change material (PCM) pack. Research shows that Varroa mites can be killed during all development stages if they are exposed to temperatures ranging between 40°C to 47°C for ~ 150 minutes. These temperatures are safely tolerated by honey bee brood and adults and do not damage the honeycomb, which will be supplied by the integrated PCM pack installed in the beehives. The innovative system is compact, robust and low cost and does not require electricity. The technology is highly portable and simple to use, as heat is released by triggering the metal disk installed inside the device.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BIOME TECHNOLOGIES PLC	Scale-up and techno-economic validation of a biobased monomer production process (based on a novel synthetic biotechnology platform) for use in a new generation of highly functional and biodegradable bioplastic polymers (BioMonomer-Scale)	£543,121	£380,185
University of Nottingham		£229,402	£229,402

Project description - provided by applicants
Biome Technologies seeks to enhance its development of next generation, bio-based molecules to provide the company with a portfolio of high-value, high-performance sustainable polymers. These in turn will further strengthen the competitiveness of the company and contribute to the transition away from the fossil-oil based polymer industry.This project, in collaboration with the University of Nottingham, will use a robust, metabolically diverse organism (_Cupriavidus necator_), in a contained environment, to produce target bioplastic monomers at pilot-scale. The work uses advanced synthetic biology techniques and state-of-the-art processing for the production of highly biodegradable, compostable and recyclable bioplastic polymers suitable for flexible packaging applications. This project builds on previous work by the partners and has the potential to significantly contribute to the UK's scientific and commercial position in the field of advanced bio-based and compostable packaging material development, allowing the UK to reach its 25-year environmental target.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
HUNPRENCO (PRECISION ENGINEERS) LIMITED	Development of a novel Silicon Carbide thermal spraying process	£434,440	£260,664
A B GRAPHIC INTERNATIONAL LIMITED		£37,989	£22,793
University of Nottingham		£199,866	£199,866

Project description - provided by applicants

Hunprenco is a precision engineering company, largest thermal spray company in the UK (one of the largest in Europe) and world-leading manufacturer of plungers (40% of Global market) and coolers for the glass container industry.

Silicon carbide (SiC) based ceramics are widely used as surface coatings in applications requiring low friction and high wear resistance (e.g. moving components, metal working tools, and protective coatings against corrosion in steel), due to high wear resistance, high temperature strength and thermal shock resistance. Most of these coatings are produced via dynamic ion mixing, RF magnetron sputtering or chemical vapour deposition. These methods are only able to produce SiC coatings on limited size components and are considered costly and unsuitable for large-scale machine components.

To tackle the industry-wide challenge of thermal spraying SiC coatings, Hunprenco are exploiting state of the art material formulations and thermal spray methods to develop a novel application process to exploit the benefits of SiC coatings.

Hunprenco are collaborating with ABG International, the market leader in digital finishing equipment, and the University of Nottingham's Advanced Materials Research Group. We will develop the thermal spaying of SiC, scale-up our process for large components and demonstrate proof of concept in a real-world environment.

Our consortium brings together leading experts in material processing and thermal spraying, with a track record in developing innovative coatings. Furthermore, ABG International is the market leader in digital finishing equipment and successful demonstration and testing at their facility provides an immediate route to market.

Successful project delivery will cement our reputation as leading innovators within the industry and is the first step in an ambitious growth strategy to enter new market sectors.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Q-FLO LIMITED	Plasma based manufacture of CNT Fibre	£1,012,704	£506,352
University of Cambridge		£427,855	£427,855

Project description - provided by applicants

The project delivers an innovative manufacturing technique to the UK for the commercial manufacture of high performance carbon nanotube fibre. The project will demonstrate the commercial potential of the technique to produce material that aligns with the needs of national and international companies. Success will embed this technology in the UK, facilitating investment in future UK based capacity.This project represents industrial research which will enable the commercial production of high strength carbon nanotube fibre in the UK. These materials offer exceptional mechanical properties, as well as high electrical and thermal conductivity. This highly functional material has numerous uses in Automotive, Defence, Wind Energy, Aerospace, Battery, Filtration and Sports industries for applications such as electrical wiring, sensing, heat transfer and mechanical support. The IUK funding will allow the rapid development and commercialisation of the production process to meet these demands.This IUK project supports critical developments in carbon nanotube fibre manufacturing to allow increased mass production within a reactor and allows for better carbon nanotube handling. The result will be a robust and environmentally acceptable process which can be scaled to full production levels. The project is international in it's application and builds on innovation and research from grant funded work at the University of Cambridge; its successful completion will ensure that this globally important technology is anchored in the UK.

Importantly, this work links carbon nanotube fibre manufacturing with the multinational industries seeking to use the materials in their innovative products. The close links between consumer and producer allow for rapid prototyping and manufacturing development for acceleration of industrial impact.

Our consortium involving University of Cambridge and Q Flo Limited have strong connections with international and UK based end users. Although not part of the application, these end user companies will test materials and therefore will provide a research-to-production approach that will fast-track the manufacture of the best material by providing a feedback loop between production and testing.

Manufacture of these materials will enable advancement of the critical UK strategic objective for high value, high performance production in the UK.

Carbon fibre manufacturing processes generate approximately 25 te of CO_2 per te of Carbon Fibre produced. The proposed CNT Fibre process, when combined with power generation from the hydrogen rich off-gas, can reduce CO_2 by 80% from carbon fibre and a high value product. (ref 1)

1) Independent report, Williams Process Limited (2018)

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ENTOCYCLE LTD	Development of a high-precision insect rearing facility for industrial protein production utilising Black Soldier Flies.	£361,274	£252,892

Project description - provided by applicants

The project aims to make significant efficiency gains in the breeding of insects to achieve industrial-scale production of a replacement for fishmeal, an unsustainable animal feed ingredient.

The UN predicts that by 2025, the world will have a 60m tonne deficit of protein with which to feed animals, fish and humans, equating to 12x current global fishmeal production. This problem is amplified in the EU, where 95% of soy protein is imported (MVO 2015), while 88 million tonnes (€143bn) of food is wasted each year, a key feed-source of insects. It is clear innovation is needed and more specifically, locally grown, sustainable sources of protein for future food supply.

Entocycle farms and processes the Black Soldier Fly (BSF), whose larvae consume organic waste and convert it into high-quality protein and co-products, creating a circular economy. Entocycle's focus is development of bespoke innovative technology which bring down production cost through efficiency and uniformity of key processes. We have developed patent-pending breeding technology and prototyped high-potential solutions to other key challenges, bringing this much needed solution to market at competitive prices.

The companies' market entry will be the Aquaculture sector, a market where insect protein was deregulated in July 2017\. This market is worth £116m in the UK today and set to grow to £233m by 2030 (gov.scot, 2018).

The improvements on current state of the art will enable a UK company to be the first to achieve economies of scale in the industry, stealing the march in this high-value, high growth market. A local high-quality protein source will contribute to increased agricultural productivity and food security in the UK, and lower dependencies on imports.

As described by Alltech, a global leader in animal health: "Insect protein has been in the spotlight for some time now, and the industry has been waiting for a source that is both affordable and available. Entocycle was chosen as winner of 2018 Pearse Lyons Accelerator because they are addressing those two points."

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CATCHAPP LTD	Artificial Intelligence Meeting Scheduler	£173,460	£78,057

Project description - provided by applicants

CathApp is an Artificial Intelligence powered application that automates the scheduling of meetings, (business or social), thereby avoiding the need for multitudinous phone calls, emails, and text messages, see [www.catchapp.mobi][0].

CatchApp has undergone extensive beta testing, which has identified further functionality is required in order for the product to launch with the functionality the market demands.

[0]: http://www.catchapp.mobi/

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ILIKA TECHNOLOGIES LTD	PErpetual Track Sensors (PETS)	£166,783	£116,748
NETWORK RAIL INFRASTRUCTURE LTD		£49,855	£49,855
SMART COMPONENT TECHNOLOGIES LIMITED		£281,705	£197,194

Project description - provided by applicants

In this 18-month project, self-powered Sensors for monitoring key parameters affecting the performance of the railway infrastructure (load, temperature, shock, etc.) will be developed, deployed, tested and evaluated (move from TRL2-3 to TRL7). The Sensors will combine Ilika's Stereax(r) solid-state battery technology and Smart Component Technologies Ltd (SCT) novel ultra-low power sensor platform and will be wirelessly connected to Network Rail's existing condition monitoring platform (Intelligent Infrastructure). The self-powered sensors will be maintenance free and will generate data 24/7, 365 days a year.

The solid-state battery powered sensors will be the first of this type developed and tested for the railway industry. Solid-state batteries offer substantial benefits over currently used lithium-ion batteries, including; low leakage currents, compact design with twice the volumetric energy density of Lithium-ion batteries, high power density and cycle life of 5,000 cycles (equivalent to a 10-year lifespan).

The self-powered Sensors will be demonstrated on live Network Rail infrastructure as part of a 6-month trial deployment. Three representative Network Rail trial sites will be chosen, specifically targeting known problematic sites, as well as high speed and high frequency lines. At each trial site, Sensors will be distributed at 10m intervals, on strategic components (e.g. points motor, crossing nose, stretcher bar, etc.).

The project directly addresses challenges identified by Network Rail for 'Reliable and Resilient Switches' and will enable the widespread deployment of sensor technology in the railway industry.

The project consortium consists of Ilika (lead), Smart Component Technologies Ltd and Network Rail.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BLOCK DOX LIMITED	INSENS: Indoor Environmental Sensing for Improving Health, Wellbeing & Productivity in Buildings.	£403,007	£282,105

Project description - provided by applicants
Indoor environmental air quality directly impacts the health, wellbeing, & productivity of occupants. Studies evidence 4-6% performance decrease when offices are too hot/too cold; 101% increase in cognitive scores in well-ventilated offices and increased in productivity per employee of at least US$6,500\. Public Health England blames unhealthy buildings for costing the NHS over £7.4bn annually, & research from the Canadian Green Building Council has shown healthy buildings to be worth at least 7% more. The UK Green Building Council has identified current methods for measuring indoor environment data as "_highly challenging_".   **INSENS** is an affordable, retrofitable, real-time Indoor Environmental Sensor analytics solution to measure & analyse building health in real-time, integrated with real-time occupancy data & building management systems (BMS). The solution addresses an unmet market challenge with potential to be applied to other sectors including Smart Home & Smart Transportation.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ZEDSEN LIMITED	Tumour Detection in the Breast	£498,759	£349,131

Project description - provided by applicants
Although the biggest cause of premature female death, if diagnosed early breast cancer is curable. Zedsen is therefore developing a unique, wearable device which contains completely harmless next-generation sensors. It will be low cost, completely safe and will be both quick and simple to use. A smart phone will remind the owner once a month to wear the device and conduct a scan. If any abnormality is detected it can then be dealt with rapidly and simply. This highly innovative technological breakthrough from Zedsen, now being part funded by Innovate UK, represents yet another UK healthcare world first.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
GRAVITY SKETCH LIMITED	DRIVE (Design in Realtime Immersive Virtual Environments) - Gravity Sketch Limited	£405,446	£283,812

Project description - provided by applicants
The UK must continually innovate to stay at the forefront of automotive design. There is an opportunity to improve the automotive design process, as its currently inefficient, expensive and time-consuming. This ambitious Industrial Research project lead by UK-based, micro-SME Gravity Sketch, will develop DRIVE a platform allowing automotive designers and engineers to collaborate in real-time, immersive co-creation to produce high resolution industry-grade CAD data. DRIVE will allow rapid growth/scale-up of Gravity Sketch to deliver significant economic benefits to the UK economy and UK automotive and creative industries. DRIVE will conduct sophisticated R&D to prototype and prove viability of a platform to allow quicker automotive design cycles. This project has been meticulously planned for maximum innovation, commercial potential, UK-wide impacts and value-for-money. DRIVE will address market needs and support the UK to remain at the forefront of automotive design.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CEREBRUM MATTER LIMITED	Digital technology to addresses onset of neurodegenerative disorders in an ageing society.	£338,716	£152,422

Project description - provided by applicants
There is an increasing proportion of the global population with memory problems, depression, space-time disorientation or decreased logical reasoning with aging. These onset symptoms may lead to early-stage neurodegenerative disorders e.g. dementia. As these conditions progress, the brainwave activities decline. Present drug treatments come with severe side-effects, and non-drug treatments i.e. brain training apps are not patient specific and are not validated through clinical trials. We aim to address this global issue by developing a unique-personalised, clinically validated technology which improves a patient's cognitive brain function through application of therapeutic games and machine learning. Benefits: Benefits: (1) non-invasive; (2) improved mental ability; (3) reduced depression; (4) can provide early diagnosis; (5) ensures patient independence; (6) reduced reliance upon NHS and improves UK economy; and (6) will strengthen UK as leader in neurological disorder research.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
INTERCEDE VENTURES LTD	Aircraft surface management system offering validated reduction in fuel consumption and carbon footprint	£137,464	£85,228
University of the West of England		£58,318	£58,318

Project description - provided by applicants
A major contributor of carbon emissions is global transportation. Encouraged by government legislation and customer pressure, the global aviation sector continues to seek methods to reduce the amount of carbon generated by the industry. Dirt deposits on aircraft exterior surfaces can reduce the ease with which an aircraft can fly through the air and, consequently, increase the amount of fuel the aircraft burns. This may only amount to a few percent, but across multiple aircraft over an extended period the increase in greenhouses gases emitted is significant and the additional costs for an airline can be extremely large. Working with the airline industry, Intercede Ventures Ltd (IVL), supported by the University of the West of England, Bristol (UWE) have invented a new system to help airlines to minimise expenditure associated with increased fuel consumption due to dirt deposits, and consequently, additionally, enhance an airlines 'eco-credentials'. IVL's IASA _(trade mark)_ system provides a complete solution for airlines to facilitate management of the cleaning of their aircraft. It includes a novel instrument to measure dirt deposits on an aircraft's surface (for ease and safety the measurement is performed from the ground, shining optical beams at the surface to be measured), together with software to calculate a cost associated with the fuel consumption related to the measured dirt deposits, in order to determine if cleaning is required. The IASA system will have full aircraft manufacturing approvals and traceability. It will also be validated to evidence the reduced carbon footprints for aircraft using the system, which represents vitally important data for airlines in relation new requirements which come in to force in 2020\. In this project, the surface analyser instrument will be developed and tested on aircraft structures. In addition, algorithms and associated software will be developed to analyse data from the new instrument to indicate when an aircraft should be cleaned. Finally, trials will be performed on working aircraft over a period of 6 months. The current standard in the airline industry is that aircraft are cleaned at predefined times in the year (typically 4 times). The trial performed in this project will verify the ability of the IASA system to reduce fuel consumption relative to this standard industry approach, by tailoring cleaning for each aircraft.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
AXIS ENERGY PROJECTS LIMITED	Axis TLB System - Model Tests	£177,726	£124,408
University of Edinburgh		£74,734	£74,734

Project description - provided by applicants

With the projected growth to supply the clean energy from 103GW to 268GW by 2050, the UK/EU government anticipates a market for deep water floating wind generation.

From 2017-2018, TRL3 was reached when the University of Strathclyde successfully confirmed numerical analysis of the system. This project concerns the validation of TRL4 of the floating wind system by performing tank tests at the University of Edinburgh's FloWave tank facility.

The system has been modelled with a 10MW turbine in northern North Sea conditions and, not only does it provide excellent stability for the turbine in operational conditions, it still provides stability for the turbine with the highest tensioned tether failed in the worst operational and storm conditions.

Its novel design minimises mooring loads via a number of features. Tether tensions are thereby minimised reducing their cost, further reducing the amount of steel required in the buoy and the size of the anchor.

The novel design of the central column damps the system, reduces tether peak tensions and tension fluctuations with an associated improvement in their fatigue life. Previous work has concluded that _"The flooded central column can lead to significant reductions in both surge and heave motions compared with the non-flooded central column. This feature further reduced the fluctuations in the tethers' tension and improved the stability performance- University of Strathclyde"_ The column is in fact an oscillating water column with the potential for wave energy to beharvested via a suitable wave energy converter. The design of the damped foundation reduces fatigue in the turbine thus reducing Operational Expenditure (OPEX).

A safe, stable and efficient installation method has been devised.

The proprietary modular gravity anchor is proven technology. It is easy to install. No heavy lift vessel is required and there are no expensive, acoustically polluting, piling operations. Its small footprint ensures that the environmental impact on the seabed is minimal, the anchor is placed on the seabed embedding under its self-weight. There are no drag embedment anchors or catenary anchor legs to disturb the seabed. Disruption to other stakeholders such as shipping and fishermen is reduced by virtue of the vertical tethers.

The combination of all these factors ensure a safe, easy to install, reliable foundation for floating wind. It provides the opportunity for combined wind and wave power generation and ensures the lowest LCOE, less than £95 /MWh - this in northern North Sea harsh environmental conditions.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
BIOTOOLOMICS LIMITED	Novel technology to purify viral vectors free of empty capsids for gene therapy use at manufacturing scale	£443,996	£310,797

Project description - provided by applicants
Gene therapy has formed one of the most advanced medical technology in the modern precision medicine area. It has shown some unique advantages in curing certain diseases. There is a growing demand of high quality viral medicines to be manufactured with efficient and cost-effective methods. This Research Project proposes a highly efficient chromatography bead technology to elegantly remove host-cell-based impurities and virus-related impurities to obtain high quality viral materials at processing scale.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
LAUNCHPAD RECRUITS LTD	LaunchPad Recruitment Process Automation	£430,025	£193,511

Project description - provided by applicants
LaunchPad Recruits (LR) is an innovative tech startup based in London that provides video assessment software. Founded in 2011, LR quickly became a leader and a trendsetter in the video interviewing market by implementing proprietary software with reviewing and bias management functionality. By developing the Recruitment Process Automation (RPA) solution, LR will improve the recruiter's ability to screen large recruitment campaigns while providing a superior recruitment experience to candidates. The greatest advantage of video assessments is the potential wealth of data that is collected such as speech, emotions and expressions. The proposed solution will be able to use features from the data collected to automatically predict a candidates' ability and fit into a company. Additionally automated-scheduling is used to move candidates along the recruitment funnel quickly. By using LR's Verify anti-bias reviewing software, RPA will be able to remove interviewer bias and inconsistencies in recruitment to achieve a more diverse and skilled workforce. As a result companies will incur a significant reduction in costs and experience a large increase in productivity. Implementation of this solution has large potential to disrupt the recruitment market.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
IOCOM UK LIMITED	IOCOM: Next generation telecommunications for the emergency services	£498,317	£348,822

Project description - provided by applicants
IOCOM is an advanced collaboration platform that allows governments and enterprise organisations to collaborate securely and reliably over the internet. The company's patented technology allows unrestricted sharing of video, voice and data to enable next-generation virtual services. In the proposed project, IOCOM proposes to develop a 'smart ambulance' with the view of putting a virtual doctor in every ambulance, enabling the correct specialist to diagnose the patient at the earliest opportunity to save lives and costs.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
GRID SMARTER CITIES LTD	FTCP - Freight Traffic Control (Construction) Platform	£454,072	£317,850
EB CHARGING LTD		£18,980	£13,286
LONDON BOROUGH OF CROYDON HOLDINGS LLP		£14,765	£14,765

Project description - provided by applicants

Construction activity is essential to ensure the regeneration of not only London but also all UK cities and ultimately all cities around the world. With growing populations and increased urbanisation there's an ever-increasing need to provide more buildings for offices, retail and leisure and transport infrastructure to facilitate urban mobility.

Whilst this growth potentially poses a problem it also creates opportunities for cities to develop new systems and processes facilitating and enabling streamlining of existing operations and develop new commercial models. The benefits of co-ordinating existing technologies and enabling user adoption through a nudge approach has the ability to deliver not operational benefits but also new revenue streams from optimisation of a city's assets such as the kerbspace and road network. Efficiencies for fleet operators from being able to book guaranteed delivery slots and reserve holding areas means savings in fuel, time and thereforein emissions benefitting the environment both generally and locally. Reduced miles driven means fewer accidents.

Building visibility of construction freight vehicle movements into planning consent enables this anonymised data to be fed into real-time traffic management systems and historic data can be used in future modelling including how and where Clean Air Zones could be implemented. From an operator's perspective the granularity of data movements will enable a better understanding of whether EV HGVs could be considered as a cheaper operational option as well as enabling operational efficiencies from insightful interventions

In London 35% of daytime HGV traffic in London is generated by the construction industry, equating to 520,000 miles per day. The annual value of construction in London is £31bn and the volume of construction freight is only set to grow further. This work generates a significant amount of road freight movement, which in turn increases congestion, emissions and road risk. The cost of construction road freight for the whole of London is £780m.

Grid Smarter Cities intends to build a Freight Traffic Control Platform for construction freight to enable:
- guaranteed landing slots for deliveries at or adjacent to construction sites
- guaranteed holding areas at defined time / distance from site to prevent vehicle circling
- visibility of all vehicle movements in real-time to ensure adherence to prescribed routes
- improved delivery management for site operators
- improved routing and scheduling for delivery fleets
- EV HGV viability
- commercialisation of the kerbspace through booking fees.
- modular approach to enable scaling.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Team Enterprises	A low cost, small footprint garden bike store	£137,592	£96,314

Project description - provided by applicants

In a survey of adults across the UK, 40% do not own a bike and 20% of those said that they would like a bike if they could find a suitable storage solution. For many bike owners, particularly those in built-up areas with limited outside space, the problem of storing their bike securely and conveniently has limited the amount that they want to get it out and use it.

Outside houses bikes are attached with D Locks or chains to railings but the bikes are often exposed to the elements and on full view to encourage speculative thieving. Sometimes they are covered by a fabric waterproof sheet which is not convenient to put on and off and not effective at keeping the bike dry.

The solution for some bike owners is to keep their bikes inside, hanging on hooks in hallways or generally around the home where they cause congestion and clutter up the living space.

There has also been a growing trend to erect small sheds or bike stores in front gardens however these are costly and will generally fall foul of Planning Regulations and in some cases householders have been forced to remove these shelters.

The Bike Park is a compact, low cost bike shelter

that is convenient, aesthetically pleasing and not an eyesore to the street scene when erected in a front garden

while providing protection from the weather and theft.

The Bike Park concept is based on utilising a low cost plastic sheet material that can be pressed/heated to form an integral hinge. With a planned manufacturing cost of £20 the Bike Park retail price is designed to be less than half that of current products with added benefits of being

*smaller footprint and better suited to a front garden

*more secure against theft

*aesthetically pleasing and less conspicuous to thieves

*lower cost delivery/easier for consumers to collect from store

*easier for DIY home assembly/installation

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
IPROOV LIMITED	DEVISIVE - Detection of VIdeo Synthesis attacks In VErification	£275,536	£192,875

Project description - provided by applicants
Project DEVISIVE uses the very latest advances in machine learning and image processing to address the challenges of synthetic video. Videos that show untruthful imagery of people present a major threat to society, and their detection in certain contexts will be crucial. Building on its leadership position in assuring genuine presence, iProov will undertake leading edge industrial research in this project to develop innovative technologies to defend citizens' identities against this emerging threat.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FIBERIGHT LIMITED	HARRPP Higher-value Advanced Recovery and Recycling of Paper and Plastics	£290,369	£203,258
MDS RECYCLING LIMITED		£50,789	£35,552
PRESTON BOARD AND PACKAGING LIMITED		£81,796	£49,078
SILTBUSTER LIMITED		£72,325	£43,395

Project description - provided by applicants

Current sorting and recycling processes generate ~15% waste or 'reject' materials which have traditionally been uneconomic to recycle; these wastes are non-target materials that are typically landfilled or incinerated, 'wasting' potentially valuable materials and resources. This project will develop a solution for these waste materials, enabling them to be recycled with an associated wealth of environmental and economic benefits.

This project will establish the viability of developing a facility in the UK to recover value from this residual waste. Fiberight has developed an innovative circular economy solution to create value-added products from residual waste, which is typically sent to landfill or incinerated. This project will showcase the recovery of two main resources from residual waste; fibre (from paper and card) and plastic film (from plastic bags, packaging etc.) and demonstrate the use of these in the production of new cardboard-based products and within recycled plastic pellet products.

The project will generate significant positive environmental impacts by diverting waste from landfill, by recovering valuable materials to be used again and by achieving carbon savings to help combat climate change. There will also be economic and social benefits through developing UK domestic recycling capacity and job creation.

The partners involved in the project are: (i) Fiberight Ltd, an SME who has developed an innovative waste recovery process for residual waste; (ii) Romiley Board Mill who recycle waste paper to manufacture cardboard products; (iii) MDS Recycling a plastic processing and recycling company who create plastic products that meet international import requirements; and (iv) Siltbuster a UK-based equipment manufacturer of washing and separation equipment and water treatment facilities.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SYMPHONY VENTURES LTD	Project Allegro - Making the benefits of Robotic Process Automation accessible for SME businesses	£481,934	£284,341

Project description - provided by applicants
Robotic Process Automation (RPA) is the use of software to automate operations software that organisations use to run their business processes. Deploying RPA brings the associated business processes more efficiency, consistency and improves processing speed and quality, delivering Business Process Optimisation (BPO) through the stages involved in its application, implementation and use. The aim of the Allegro project is to simplify, significantly, the process by which RPA can be deployed. This will be achieved through the application of computer-based image and voice processing and machine learning to capture and understand how a business process is completed by a human operator. The resulting representation of the business process will then be automated using one or more of the available RPA products.   The main objective of the project is to create several proof-of-concept and prototype demonstrators of the new business process capture approach and evaluate these to confirm that the image and voice processing and machine-learning techniques can be used appropriately. The initial set of business processes to be captured will be focused on financial record keeping and human resources record keeping.   The key benefits accrued from this new approach are: * The human effort required to capture the definition of a business process will be reduced significantly (a reduction of over 75% is a long-term objective). This makes the deployment of this system available to SMEs as well as the current target market of large enterprises;   * For customers of this system the time to achieve return on investment will be significantly reduced. Alternatively, this product will become available to SMEs who traditionally cannot make use of RPA tools due to their cost of deployment.   * Customers will be able to build solutions that make use of best-of-breed RPA solutions without being vulnerable to supplier lock-in.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SUNDOG MEDIA TOOLKIT LTD	Machine learning for automated colour processing of high dynamic range motion picture content	£441,552	£309,086

Project description - provided by applicants
Use of artificial intelligence applications to address high dynamic range and wide colour gamut colour pipeline issues in professional media production.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FLOREON-TRANSFORMING PACKAGING LTD	Reuse and Recycle: Improving End of Life Options for Bioplastics	£137,176	£96,023

Project description - provided by applicants
Bioplastics are poised to become the leading viable alternative to oil based plastics, but in order to achieve market traction, significant improvements in material properties are required to take them from niche deployments to wide-scale adoption. Floreon provide high performance bioplastics that don't cost the Earth. The aim of this project is to further enhance the performance of an existing bioplastic compound, increasing its reusability and recyclability which will open up new and demanding applications such as stadium/festival cups and cutlery. Producing these products from a sustainable sourced bioplastic will reduce oil-based plastic usage offering a viable alternative to oil dependance. The base material of Floreon's bioplastic is completely renewable and has a far lower carbon footprint to produce (70% lower than polystyrene) so the resulting products are better for the environment both before and after use.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SWITCH THAT TECHNOLOGIES LIMITED	BoilerGuardian: Smart Heating System Fault Monitoring over NBIoT	£102,520	£71,764
WATT KNOWLEDGE LTD		£33,840	£23,688

Project description - provided by applicants

The UK has the largest number of domestic boilers in Europe, by 2020 there will be over 24M dwellings that will have gas or oil boilers (Source: BSRA, 2017). These heating systems are of a variety of ages and efficiencies. Smart boilers have the potential to reduce energy bills, currently 55% of the average domestic energy bill is due to heating. Typically, an inefficient boiler wastes around 10% of the energy it consumes.

This project is focused on making all these boilers smart without having to change the boiler. We achieve this by simply adding a small beacon to the boiler to monitor the system, together with advanced intelligence and data analytics.

Imagine you could:

* Save on costly boiler repair and prevent unnecessary boiler damage
* Have smart heating, without having to buy a new boiler
* Be alerted to faults before they become expensive to fix
* Reduce your energy bills, with personalised advice based on your real usage

Suppose you have a portfolio of properties that you manage, you will want to:

* Know which boilers need priority servicing/maintenance
* Advise engineers of the type of fault so they have the relevant spare parts
* Monitor boiler usage so it is not neglected or overused
* Report on the performance of boilers across all the manufacturers in your propertyportfolio to help you plan and make purchasing decisions

As a carer, fit our technology to heating systems of elderly/vulnerable relatives, to monitor their heating and you can ensure that their home temperature does not go below a safe threshold and that their boiler is safe.

Imagine you are an energy supplier and you want access to heating use data to better plan energy supply and to give consumers more choice between personalised tariffs. Imagine you are leading a council or government department and you want to prioritise eco heating subsidies, winter payments and fuel allowances to those that need it the most. Imagine you want to ensure that elderly, disabled or vulnerable people in your community have safe, efficient and well maintained boilers and are using them appropriately during cold spells.

This project addresses all of the above. We will design low power beacons that can be fitted to existing boilers and test the feasibility of a secure and resilient software analysis platform which takes data from locally fitted boiler beacons for all the features described above.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
NQMCare	NQM Care Analytics	£391,252	£273,876
SOUTHERN POLICY CENTRE LIMITED		£97,492	£68,244

Project description - provided by applicants

NQM Care Analytics applies Artificial Intelligence and Statistical techniques to the problem of social care delivery.

The compound impacts of an ageing population and diminishing resources for local authorities mean our social care system is in crises. Local authorities are faced with the impossible problem of doing more with less. The economic realities of current services provision mean not only is it getting harder and harder for citizens to qualify for state assisted support, but also that care agencies are becoming insolvent or refusing to bid on contracts because they are not financially viable.

NQM Care analytics uses a portfolio of AI and big data modelling techniques to helps address these issues. Using the individual social care records, combined with national population models and derived health, social and economic indicators, it is possible to provide detailed analysis and recommendations which can improve the planning and running of an efficient social care system. Specifically NQM Care Analytics provides the following features.

1) Performance analysis: using national and locally derived models we can benchmark care agency performance, localities and health conditions against each other in order to better manage service provision.

2) Impact analysis: using fine grained historical data we can evaluate the impact of policy management interventions near to real time.

3) Commissioning triaging: by providing a synthesised view of a patients case history, overlaid by a statistical model of prognosis (with our without interventions), we can provide social workers with better information in order to commission their services.

4) Infrastructure planning: local authorities need to plan for the future, whether this is staff recruitment, tendering for agencies or physically building infrastructure, like care homes, these are multi million investments that need to be correctly sized to make best use of the public purse. Proven modelling tools can be invaluable in this context.

Our innovation is two fold. Firstly, using the proven, highly secure Trusted Data Exchange, we are granted access to confidential individual social care records for analysis; something not typically allowed. Secondly, using advanced Bayesian network methods, we induce complex statistical models which can improve the planning and management of social care.

This technology has already been prototyped with Hampshire County and Southampton City Councils, using raw data.

The project is an active collaboration between NQM, providing data analytics expertise and Southern Policy Centre, a think tank comprising former local and central govermetn officials who will provide complemnetary consultancy

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FREE RUNNING BUILDINGS LIMITED	FREEHEAT: Revolutionising the viability of natural ventilation through heat recovery	£684,742	£479,319
University of Sheffield		£259,530	£259,530

Project description - provided by applicants

Free Running Buildings Limited targets the first cost-effective high-performance passive ventilation system with heat recovery, with the aim of radically reducing the energy, carbon dioxide and cost-burden of achieving legislative requirements for indoor-air-quality in public-sector buildings: namely schools, healthcare facilities and leisure centres.

Health, performance and productivity of occupants in these buildings is significantly impacted by failure to maintain acceptable levels of carbon dioxide, pollutant/allergens and temperature. Adequately ventilating these buildings requires the inside-air to be fully refreshed every 6-10 minutes, with existing approaches to ventilation and heating yielding over 60% of energy-use and running-costs in these sectors.

To address the huge energy and cost-demands of current technologies such as air-conditioning or mechanical ventilation systems, adoption of wind-tower-based passive ventilation is growing. However, the requirement to constantly and rapidly raise the inlet air temperature, when the weather outside is below a comfortable ambient temperature, stimulates a significant space-heating requirement in many market territories. This requirement fundamentally restricts the zero-energy operating window and corresponding viability of this approach in many scenarios.

In response, and working collaboratively with the University of Sheffield (Building Energy Group and the Advanced Manufacturing Research Centre), Free Running Buildings now aims to further develop their core technologies for wind-driven passive ventilation and heat-exchange to realise FREEHEAT. Targeting a 5-degree Celsius thermal gain using novel heat pipe designs and configurations to capture exhaust energy and pre-heat inlet air to realise a step-change in passive heat-recovery-efficiency and system weight, integrating this technology into their proprietary modular flat-pack assembly also catalyses new retrofit capability for existing passive ventilation systems.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

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
Proxima Concepts Ltd	Improved Oral Vaccine for Coccidiosis in Chicks	£499,197	£349,438
University of Edinburgh		£190,661	£190,661

Project description - provided by applicants
Coccidiosis is a disease of young birds caused by the _Eimeria_ parasites and its infection causes severe weight loss and distress to the infected animals. In addition, infection with _Eimeria_ parasites will predispose the birds for secondary infections especially with bacteria leading to clinical disease, loss of appetite and welfare issues. _Eimeria_ is one of the most prevalent pathogenic organisms causing disease in chickens leading to losses of over $3 billion worldwide each year. The most desirable method for combating coccidiosis is vaccination, but current vaccines are problematic since they are difficult to manufacture, employing live parasites which require replication in chickens. Also the use of birds to produce the current vaccines raises additional safety and welfare issues. To date no commercial vaccine based on recombinant proteins exists, and current attempts to construct sub-unit vaccines have been limited by the absence of a robust, cost-effective delivery systems that can be easily administered to large numbers of birds. A vaccine for the protection of chickens against coccidiosis will be developed using known recombinant antigens incorporated into a validated oil-based oral vaccine formulation. In these studies, we will target _Eimeria tenella_, the most economically important _Eimeria_ species. The vaccine will be designed so that the end product can be added to poultry feed, a convenient, low cost, large scale route to vaccinate large populations of animals. This vaccine will overcome problems in the poultry industry relating to loss of livestock as a result of infection with _Eimeria_. This project seeks to overcome these problems by using a highly effective vaccine carrier based on oils which have demonstrated protection against disease in other animal models, such as plague and avian influenza. In this proposal these oils will be supplemented with stimulators that enhance the immune responses of the chicken. Once the most immunogenic combination is selected, vaccination challenge experiments will performed to test their potential to protect birds against _Eimeria_ infections.

Results of Competition: Open Round 2

Competition Code: 1807_OPEN_R2

Total available funding is £20 million across 2 streams

Participant organisation names	Project title	Proposed project costs	Proposed project grant
UNMADE LTD.	KICK (Key Innovations enabling Customised Knitted footwear) - Unmade Limited and New Balance Athletic Shoes Limited	£715,436	£321,946
NEW BALANCE ATHLETIC SHOES (U.K.) LIMITED		£143,471	£35,868

Project description - provided by applicants
Need - Both global demand for customisation and knitted athletic footwear are rapidly increasing, however customised knitted footwear cannot be mass produced because of factors including the inadequate dimensional tolerance of custom knitwear, varying yarn properties and the need for improved order management and customisation technologies. **Project -** KICK aims to prove the technical and commercial viability of innovative technologies to address the opportunity. This project will output prototypes, trial results and commercialisation plans. **Impact on Team -** This project will improve the business productivity, growth and create export opportunities for project lead Unmade and partner New Balance. This technology represents a step-change in capability and offers the significant competitive advantages for the team, manufacturing sector and UK.

Results of Competition: Open Round 2

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
THE FOUNDRY VISIONMONGERS LTD.	SmartROTO	£416,174	£249,704
DOUBLE NEGATIVE LIMITED		£284,018	£142,009
University of Bath		£106,625	£106,625

Project description - provided by applicants

SmartROTO is a 21 month R&D project which aims to design, develop and demonstrate intelligent tools for high-end rotoscoping of live action footage and will also investigate the sharing of machine learning networks and datasets between industrial and research communities. The ability to share huge datasets from real world productions has the potential of significantly accelerating the research and development of machine learning.

In modern visual effects ('VFX'), the manual separation of filmed elements, "rotoscoping", is an essential part of the digital post-production process. It is time-consuming, manual and largely non-creative, typically outsourced (outside the UK) and has remained unchanged for the last decade. The SmartROTO tools will address the need for optimisation of this process by using machine learning to create a step change in rotoscoping technology. The technology will minimise the interaction required by the rotoscoping artist while keeping a familiar and intuitive user experience.

SmartROTO brings together three world leading organisations: Foundry, Double Negative (DNEG) and University of Bath (UoB). Foundry is the project leader and its success has been built on its cutting edge software development for post-production. In SmartROTO they will provide their expertise in image manipulation tools to develop technology to allow easy rotoscoping of media objects. DNEG is one of the world's leading visual effects, animation and stereo conversion companies for feature film and television. They contribute huge datasets to the project along with their highly experienced technical R&D Team and rotoscoping artists. The University of Bath provide the core innovation in computer vision and machine learning to create novel technologies (algorithms and mathematical models) that will underpin SmartRoto.

The SmartROTO technology will bring significant savings to the VFX industry, a new plugin for NUKE from Foundry and new ways to share training datasets.