

Innovate UK

Results of Competition: Open Round 2 24 to 36 Months

Competition Code: 1612_EE_OPEN

Total available funding is £15m (for all 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
Far-UK Ltd	Thermoplastic: Monomer to Automotive Parts (TMAP)	£249,746	£174,822
M Wright & Sons Ltd		£249,504	£149,702
Oxford Advanced Surfaces Limited		£239,837	£167,886
University of Derby		£238,977	£238,977
Project description - provided by applicants			
To meet the future needs of the vehicle production industry ways of reducing CO2 are required. Improvements in powertrain are only able to meet a portion of this challenge, to deliver the complete reduction in CO2 required a massive weight reduction of current vehicles is required. This weight reduction also must be accomplished by without affecting the performance, safety or quality of the vehicles. In addition, if the vehicles are to be taken to production then this must all be achieved cost effectively. This programme aims to develop a new range of materials that meet all of these challenges. The materials being developed are based around thermoplastics. These materials benefit from enhanced recyclability and the processes employed in this this programme will allow these materials to be used cost effectively in structural applications in the automobile industry.			

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Dice Industries Ltd	Biodice (Super light Thermal Propulsion Unit)	£242,483	£169,738
JWA Racing Limited		£500,000	£350,000
University of Birmingham		£255,984	£255,984
Project description - provided by applicants			
<p>Dice offers a subtle but game changing advancement to the proven Otto cycle by utilizing the cylinder space under the piston as a secondary 'boost' combustion chamber. The reduced engine mass leads to lower fuel consumption, consequent lower emission output and manufacturing costs. Thus, the project is aligned with the scope of boosting UK growth, opportunity and sustainable transport. The University of Birmingham (UoB) has a wealth of knowledge, knowhow and expertise in the optimisation, emissions reduction and simulation of ICEs. The funding would bring about a final prototype, small production line and a small concept vehicle. This technology will allow the mass of the engine to be reduced thereby increasing fuel efficiency of vehicles and aims to demonstrate how to reduce the carbon impact of ICEs. DICE technology is compatible with any spark or compression ignition fuel and is aligned with hybrid electric vehicles, where adoption of the technology will allow larger batteries to be fitted. Fuel consumption reductions have considerable economic benefits to users, and Dice is aimed at the attainment and advancement of EU directive 333/2014 to reduce CO2 emissions, especially for trucks. The DICE engine does not change the fundamentals of internal combustion, and can be used with any fuel including biofuels, alcohol and hydrogen etc. A huge contributor to CO2 are trucks and it is widely accepted that electrification for trucks is not feasible. This is just one area where Dice technology should be implemented.</p>			

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Faiveley Brecknell Willis	Self-sensing railway electrification system for efficient operation and improved maintenance	£651,467	£325,734
City University of London		£270,994	£270,994
Sengenla Ltd		£76,955	£53,869
Project description - provided by applicants			
<p>The increasing demand for improved efficiency and reliability in the rail industry worldwide drives the market for advanced asset and fleet management tools, including remote diagnostics (or prognostics) and better asset planning offering real value-for-money to operators. The focus on safety will also increase: rail automation will help increase efficiency without compromising on safety and thus reduce what could be a major area of rising costs. There are some measurement systems available for monitoring rail electrification systems, for example, by using multiple strain gauges and accelerometers, however their power delivery and data transmission require a careful insulation under such a high voltage condition. This limitation could lead to some extreme scenarios, such as dewirement, thus causing a widespread traffic disruption. This project addresses the above challenge by exploiting the ideal insulator nature of the optical fibre itself through integration of optical fibre sensors into the current-collecting pantographs for remote monitoring, when AC locomotives are powered at 25kV and travel at speeds up to 350 km/h under all weather conditions. The sensor data obtained will be used both for integrated control and for the development of a condition-based maintenance model, to allow better asset and fleet management without comprising on safety. The key objective of this project is to translate the innovative research into a new product that is able to improve the reliability and efficiency and lower the cost of rail operation and maintenance that benefits the large population worldwide.</p>			

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Ncam Technologies Ltd	RTC - Real-Time Compositing	£862,543	£603,780
Project description - provided by applicants			
RTC – Real-Time Compositing - will carry out Research & Development to create a new real-time compositing 'VFX-in-a-box' product to replace traditional compositing in a post-production pipeline and also greatly improve on limited overlay systems used on set locations. The approach will exploit recent CPU & GPU advances in modern PC architecture, and include game engine technology to make real-time compositing of 3D object elements at high quality a real possibility. This will disrupt the outdated iterative post-production workflow (using final-frame renders) with real-time on-demand results providing huge efficiency gains and quality improvements for companies that use it. RTC will achieve the first ever real-time solution for compositing of visual effects which can be used both in the traditional markets (broadcast and film/TV post-production); as well as enabling professional level Augmented Reality (AR) and wide ranging use in general live presentation techniques for emerging markets across many industry sectors.			

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Metrosol Limited	The Development of an Industrial	£316,865	£221,806
NPL Management Limited	Primary (Johnson Noise) Thermometer	£30,982	£15,491
Project description - provided by applicants			
<p>This project aims to develop a fundamentally different type of thermometer (based on the measurement of Johnson noise) that will not drift. Conventional thermometers are "secondary thermometers" in which a property is measured that is affected by temperature, for example most digital thermometers measure either the resistance of or the voltage produced by the sensor. However, the property measured can be affected by other things so these thermometers drift as they age. This new thermometer is a "primary thermometer" in which the parameters measured are linked directly to temperature by a fundamental physical law, which does not change with time. The phenomenon has been known for a long time, but the signals involved are so small that it has not, so far, been possible to make these measurements reliably in a typical industrial environment. A new approach to measuring Johnson noise will be employed that overcomes the problems that have so far prevented this technique from being used to measure temperature in industrial applications. A successful, commercial Johnson noise thermometer is expected to capture a significant share of the high-performance segment of the industrial temperature measurement market.</p>			

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Worldwide Fruit Ltd	VisionDSS: a low cost portable imaging solution to improve quality, increase productivity and reduce storage losses of premium apple varieties	£219,524	£109,762
Fruition PO Ltd		£209,200	£104,600
Stemmer Imaging Ltd		£236,650	£118,325
NIAB		£295,979	£295,979
T&G Group (Turners and Growers)		£38,080	£0

Project description - provided by applicants

There is increasing consumer and retailer demand for high-quality UK-grown premium dessert apples, and this will increase further post-BREXIT as retailers favour British produce. However, achieving consistent high quality across variable growing seasons is difficult, and premium varieties are susceptible to storage disorders that can render whole consignments unmarketable, leading to losses of £2.5-8.3Mp.a. In some years, losses of 30% present a serious reputational risk and jeopardise future production and marketing strategies. The pre-harvest factors that lower eating quality and predispose fruit to storage disorders are not yet known, but research has shown that targeted nutrition management can elevate antioxidants in apple tissue that help to mitigate against the development of disorders. However, little is known of the changes in fruit biochemical composition during the growing season that predispose fruit towards storage disorders, and so the development of mitigation strategies has been restricted to adjusting post-harvest, high cost, high stringency storage conditions. New technologies that provide assurance of quality after long-term storage will help to extend the selling season of UK-grown apples and drive import substitution. This project will develop a low-cost, portable vision system, incorporating mathematical models and algorithms to deliver a DSS for growers to inform in-season mitigation strategies and optimum picking times, to identify 'at risk' crops pre-harvest, to inform storage and marketing strategies, and to enhance the production, quality and reputation of premium varieties in the UK and globally.

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OMass Technologies Limited	A new platform for drug discovery on membrane protein targets	£659,463	£461,624
Carol Robinson Research Group (Oxford University)		£20,098	£20,098
Project description - provided by applicants			
<p>Membrane proteins represent the largest class of drug targets. Developing new ways to study these targets is therefore of paramount importance in drug development programmes. This project addresses this need by developing and applying novel technology to understand drug binding to membrane proteins in the most natural environment possible. Our innovation consists of a stage upon which we place cell membranes or mimetics, a jet of solvent is directed at the membranes and an inlet samples the particles, producing a stream of charged particles for study in a mass spectrometer. The key advantage of this approach is that it enables us to add drugs to the target in a natural membrane or mimetic, not possible previously. In addition, it addresses the limitations of current methods as it allows high-throughput analyses. Drugs to be tested can be added to the jet of solvent and directed to different parts of the membrane/ lipid bilayer preparation. As we increase the robustness of the prototype we will be able to deliver multiple drugs in turn, to discrete regions of the membrane preparation. During the course of this project we will develop our prototype in partnership with biotech, pharma and design engineers to bring the prototype to a state suitable for manufacture and ultimately to market. With this platform, and working with our partnership companies in biotech and pharma, we will change the way in which membrane targets are screened for small molecule binding and as such believe that the platform will become a downstream product and an essential component of many drug discovery pipelines.</p>			

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Forensic Pathways Ltd	LOQUITUR: bringing the field of ballistic forensics to DNA-type standards.	£341,706	£239,194
University of Huddersfield		£200,853	£200,853
Project description - provided by applicants			
<p>The increased use of firearms in criminal and terrorist acts drives the need for development of technology in the area of ballistic analysis which enables efficient and successful prosecution of criminals by providing high quality bullet, cartridge and thus firearm matching evidence. Current ballistic analysis technologies perform poorly compared to DNA evidence and the leading technology providers only offer a highly restrictive system where Law Enforcement Agencies (LEA's) do not legally own their recorded evidence. Current technologies do not make use of the latest scientific and technological developments, and their approach severely hinders evidence sharing between LEA's, using what should be compatible systems. This is specifically a problem for countries sharing a border, where sometimes bullets/cartridge cases have to be physically transported between countries to enable comparison. Ultimately this delays, and in some cases, prevents, the successful prosecution of criminals. This project will exploit the most recent scientific and technological advances to produce a cutting-edge technology which provides LEA with highly efficient, reliable, totally compatible and more cost-effective methods of generating/sharing ballistic evidence.</p>			

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Future Intelligence Ltd	Wide Smart Safe, Robust and Resilient Smart Cities Application Using Fog Computing (WATCH)	£223,986	£156,790
London South Bank University		£87,915	£87,915
Project description - provided by applicants			
<p>The aim of the WATCH project is to distribute processing to the network edge as much as possible exploiting a new type of unified telecommunication and micro-datacenter nodes able to jointly provide networking, local processing and storage resources for the support of novel applications across users with heterogeneous capabilities. The WATCH platform brings a collaborative environment to a variety of sources and devices in a smart city domain. This will be accomplished by utilising novel technologies such as SDN and NFV to facilitate the creation of "islands" of interconnected devices, which in turn form Fogs (lightweight cloud computing at the edge) to abstract resources into a unified pool. Resources on the pool will be utilised to carry out Computing, Caching and Communication (3C) resources, services/tasks and deploy them close to the end user, while at the same time use the enhanced cloud resources. WATCH objective is to improve the provisioning of smart surveillance (object detection, object tracking, and face or text recognition) using edge computing from different types of cameras (for example, body-worn cameras, Smartphone cameras, city cameras and car recorders), IoT devices and vehicles, generating media analytics. Future Intelligence Ltd, leading SME, is already providing solutions for smart city and smart lighting and markets. This project will expand its solution portfolio with new capabilities and new featured products and services. On the other hand, London Southbank University will expand its academic leadership in advanced cloud infrastructures area.</p>			

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