

Innovate UK

Results of Competition: Smart Round 4 2015-16 - Development of Prototype

Competition Code: 1509_SmartRnd4_DOP

Total available funding for this competition was £7.29M from Innovate UK

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
Orthoserve Ltd	Femoral Stem Extraction System (STEM-X)	£212,320	£95,544
Project description - provided by applicants			
<p>Total Hip Replacement (known also as Total Hip Arthroplasty - THA) uses anti-biotic medical cement for stem implant fixation; this has been the 'gold' standard for many years. However, cement adhesion is susceptible to loosening and as a consequence stem migration causes adverse pain and discomfort to the patient. Over the last 15 years total joint arthroplasty in 50% of all cases have moved to the use of 'press fit' non-cemented prostheses. However, failed non-cemented implants are very stubborn and challenging to remove during Hip Revisional (HR) surgery leading to excessive losses of healthy bone stock. In most cases an Extensive Trochanteric Osteotomy (ETO) procedure is required along with a high cost bespoke replacement implant. An ETO takes approximately 5 hours and costs at least 10 times the cost of a primary THR procedure. An ETO procedure causes excessive trauma, bone and muscle dissection, and further poor patient recovery and inadequate mobility. Orthoserve have developed their concept - STEM-X, a non-implant specific surgical femoral stem extraction system that is capable of removing failed non-cemented prostheses with minimal bone loss in 30-40 minutes (total procedure time 1.5 hours). The proposed technology must be: (1) simple, easy-to-use, produce repeatable results; (2) gives rise to minimal muscle dissection, blood-loss & bone-loss; (3) reduce the time patient under anaesthetic; (4) insure minimal operative time & surgical costs; (5) non-implant specific; and (4) allows for earlier patient discharge/recovery & better post-operative mobility, reducing the need for further follow-up surgery. Finally the system allows for the replacement implant to be one size up from the one removed avoiding the need for bespoke and high cost implant manufacture. Also, using the STEM-X system will reduce non-cemented HR clinical costs to that of primary THR procedures thereby providing huge savings for the NH and private hospitals.</p>			

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Exagenica Research Ltd	Hydra Prototype Development Project	£579,342	£250,000
Project description - provided by applicants			
<p>Currently oil tankers are strictly limited to carrying crude oil cargoes on a singular outbound journey, returning with empty holds. The proposed Exagenica Research HYDRA project seeks to build on a successful proof of concept project which proved the conceptual viability of a novel maritime engineering solution with the potential to enable crude oil, product and chemical tankers to be multi-purposed in terms of the type of cargoes they can carry. This would facilitate transportation on inbound journeys, potentially transforming shipping economics and its socio-environmental impact. The HYDRA solution consists of an innovative, pre-fabricated conversion system designed by Exagenica Research. When implemented across the respective hold areas of a tanker, the HYDRA system will extend the ship's capability to carry more varied cargoes without the need to undergo expensive or lengthy cleaning. In addition to dramatically improving transportation versatility, the HYDRA conversion has also been designed to improve the structural integrity of hold areas, minimising the potential environmental damage caused by a hull breach while transporting liquid cargoes such as crude oil.</p>			

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Fianium Ltd	FEMTOPLANE-DoP "FEMTOsecond fibre oscillator PLANar waveguide amplifiEr laser system to enable globally affordable cataract surgery - Development of Prototype"	£389,441	£175,248

Project description - provided by applicants

Cataract surgery is one of the most common surgical procedures, with nearly 24 million procedures performed worldwide each year. Driven by an ageing population, the annual market is growing and is forecast to exceed £1.6 Billion by 2019. Introduced in 2010, Femtosecond laser cataract surgery (FLCS) is regarded to be the most important advancement in technology, enabling procedures to be automated, reducing the need for skilled surgeons and enabling perfect vision without the need for spectacles or contact lenses. FLCS is currently dependent on expensive, bulky and unreliable femtosecond laser systems with price tags ranging from £300K to £370K. FLCS procedures are not supported by national or private health services and have therefore only been available to the most-wealthy patients. FEMTOPLANE-DoP builds on a highly successful Innovate-UK collaborative R&D project between Fianium and the University of Southampton where the project team proved the concept of an innovative femtosecond laser architecture, demonstrating specifications far exceeding those required for FLCS yet with potential to be ultra-compact, robust, air-cooled and have low cost of build and ownership. Within FEMTOPLANE-DoP, a fully integrated prototype femtosecond laser will be built and qualified to FLCS specification requirements and will demonstrate up to 85% reduction in price (volume target £30K) and 80% reduction in size compared to existing state-of-art FLCS lasers. The innovative laser system will be highly disruptive, leading to widespread penetration of FLCS throughout the world and enabling patients in the poorest countries to benefit from the highest-quality procedures. Successful delivery of the prototype will be the first commercialisation step towards having a medically qualified laser source in production within 3-4 years of project completion and a 20X return on investment by 2020.

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Filmlight Ltd	Filmlight - Look in the Cloud	£703,289	£246,151
Project description - provided by applicants			
<p>The eighteen-month project will develop ways for creative teams making movies or TV shows to collaborate interactively to review and agree the 'look' of a sequence across all the stages of video processing. Video for effects-rich movies and TV drama is processed by multiple teams, both on-set and in postproduction, in a series of steps involving video capture, shot management, look management, transcoding, editing, VFX, compositing and grading. Each of these steps can change the look and the dramatic impact of a sequence, but it is extremely difficult for the director to ensure that a look is communicated, applied and maintained along the chain as sequences are repeatedly edited and effects, CGI and grades are added. Work is often distributed between companies in centres such as London, California, Vancouver, Wellington, Beijing and Mumbai. Creative professionals and teams view digital sequences in different conditions and applications: there is no guarantee that the 'red' seen in a facility house in London matches the colour the director on location in Rome wants to change. Mistakes occur and the 'look' drifts away from the director's vision, leading to frustration, delay, and expensive re-working. 'Look in the Cloud' will develop a metadata system and architecture that will allow all the creative teams to see, discuss and modify the look, with a Cloud-based workspace, metadata base and application plug-ins that enable everyone (director, cameraman, DIT, editor, VFX artist, colourist et al) to see ' and know they are seeing ' the same thing, irrespective of the software application or equipment they are using. FilmLight Ltd will market the resulting system and services to facility houses, film and TV studios and production companies around the world from its sales and marketing offices in London and USA and its international network of resellers.</p>			

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Oxford Space Systems Ltd	Oxford Space Systems: Deployable Cassegrain Ka-band Space Antenna (DeCSA) Prototype	£309,449	£139,252
Project description - provided by applicants			
<p>Oxford Space Systems (OSS) is an award-winning early-stage technology business focused on developing a new generation of deployable structures for the global space industry. The diverse and experienced OSS team is rapidly establishing itself as an innovative & agile supplier to the space sector. Although an essential part of many geostationary telecomms satellites - and likely to form a critical part of a large number of smaller low earth orbit (LEO) satellites - Europe currently does not have a flight-proven Large Deployable reflector Antenna (LDA). The EU presently relies upon the US for all LDAs. The European Space Agency (ESA) recently published a Working Group report which concluded, 'From the European industry point of view, there is an absolute dependence on the USA', and, 'Large reflector technologies are considered a fundamental requirement to maintain commercial and strategic competitiveness'. This was further echoed in a document published this year, 'Critical Space Technologies for European Strategic Non-Dependence', produced by the European Commission, ESA, and the European Defence Agency. LDAs fall into two families: Offset Feed and Cassegrain configurations. OSS has already developed an innovative and highly scalable Offset Feed LDA to TRL3 that is significantly lower in mass, cost and complexity than current offerings from the USA. OSS has been approached by a USA based company to explore the development of a Cassegrain LDA. This is for a proposed constellation of up to 35 LEO microsats scheduled for launch in Q4 2018. Having profiled its outline concept to the potential customer, OSS are confident that a significant export order can be secured if a prototype can be presented by mid-2017. In addition, OSS has similar interest from both EU and Canadian companies. Securing matched funding via this SMART award will enable the rapid development of a UK space technology that has excellent export potential to Europe, USA and beyond.</p>			

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HomeTouch Care Ltd	ARCH (Affordable, Reliable Care at Home) – HomeTouch	£555,512	£249,980
Project description - provided by applicants			
<p>Families and councils are under pressure as the rapidly growing need for home care, largely driven by an aging population, cannot be met by the current agency model. This threatens the continuity and quality of UK care. Councils have cut home care £4.6bn since 2011, causing agencies to downscale services, rely on multiple carers for each client, and reduce many visits to 15 minutes. Over 85% of councils pay less than the recommended minimum £15.74 per hour for home care, of which agencies take over 50%, which leaves carers struggling on less than the National Living Wage. Poor staff retention and rates of sickness absence are mounting. With this strain, 45% of UK care agencies are in deficit and looking to exit. Agencies are beginning to turn away council block care contracts, and there is risk of market failure. Hospitals have been bearing the brunt, delaying discharges because adequate home care support is not available. Known as 'bed blocking', this issue costs the NHS £699m per year. Facing these breakdowns, councils increasingly promote 'Direct-Payments' which put the responsibility for arranging and managing care in the hands of the recipients and their families. But care recipients and their families struggle to arrange their own care. Individual contracts with agencies are expensive and difficult to navigate. Efficient solutions are required to streamline the care matching and managing process and make it financially viable. HomeTouch is an established care introductory agency with both private and Direct-Pay clients in the UK. The company has proven the concept of using technology to radically reduce care costs and complexities. It will offer advanced carer-recipient matching, verification and dynamic pricing, to help families, recipients, carers and councils easily deliver and manage care.</p>			

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Root6 Ltd	Root6 Media Packaging Agent	£555,119	£249,803
Project description - provided by applicants			
<p>The twenty-one-month project will develop a system to automate the packaging of videobasedmedia to meet the format and content requirements and standards of differentbroadcasters and on-line media distribution channels around the world.Media packaging is the essential way to provide access to programmes anytime, anywhereand on any device. Different broadcasters around the world have different technicalspecifications, as do on-line platforms and content owners such as Fox, Netflix, Disney andWarner. They have different rules about picture resolution, aspect ratio, technical metadata,descriptive metadata, countdown clock, black burst, colour bars and audio tones. Advertisingbreaks, language tracks, and elements such as call-in voting instructions (which have to beremoved for re-broadcast or on-demand versions) add to the complexity of packaging. Mediapackaging currently requires a great deal of skilled operator intervention in a postproductionsuite, working out which parts of the original or incoming programme material are to be kept,which have to be discarded and what needs to be added. Service providers are struggling tokeep up with the complexity and volume of work, which is increasingly unaffordable.Media Packaging Agent will develop a highly automated intelligent system with- An analysis engine to deconstruct incoming media and extract metadata;- User interfaces and web services to control and verify the analysis and subsequent(re)packaging- A'recipe engine' with specifications and a rules engine to manage the re-editing andpackaging- A media conforming pipeline, to packaged or repackage media to any chosen recipeor format.Root6 Ltd will market the results to postproduction companies, broadcasters and streamingmedia companies around the world.</p>			

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OpTek Ltd	Laser Processing of Next Generation Optical Fibre Interconnects.	£378,111	£170,150
Project description - provided by applicants			
<p>A Prototype of a game-changing laser-based method for processing optical fibre connectors for high-speed, low-cost termination of optical fibres will be developed within this project. The 2X annual growth of the internet and rise of ultrahigh definition video means fibre optics is taking over from electrical cables as the only viable method of moving data even short distances, whether that is between the millions of servers and switches in a data centre or between high-definition video equipment and the television. This is creating a demand for 10 billion fibre optic cables, all of which need the ends of the optical fibre to be terminated with an optical quality and consistent finish. The dominant optical fibre termination technology used by industry today involves manually polishing the fibre end using low cost labour. This produces inconsistent results and is not compatible with automation or with the step-up in volume required. OpTek have previously developed and patented a method of laser processing fibres that is used in high-precision low-volume niche applications that can tolerate high cost. Additionally, OpTek has internally developed the capability to achieve the required quality in a lower-cost platform as part of a Proof-of-Concept project. The present project translates this platform into a Prototype machine to match the target prices demanded in these high-volume applications. This will be based on the innovative laser and optical arrangements developed in the previous Proof-of-Concept stage, matched to the actual optical performance criteria required of the optical fibre terminations. The Prototype will be suitable for manufacture in the UK, providing a way for OpTek and the UK to participate and benefit from the once in a lifetime opportunity driven by the shift from copper to fibre which would otherwise only be appropriate to low-cost-base geographies.</p>			

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Protrack Solutions Ltd	Protract: Prolock - The Communicating Smart Padlock	£369,212	£166,145
Project description - provided by applicants			
<p>The countries infrastructure for water, electricity, rail and telephone are protected in rural areas by over 1M padlocks. Unauthorised access to this infrastructure could remain undetected for days or weeks. The remoteness of the sites often makes guarding by patrol impossible. In these days of a heightened state of alert this could be a risk waiting to happen. Management of keys for this infrastructure is notoriously difficult. Bunches of keys are regularly lost or worse still stolen making the risk of theft or water pollution made difficult to attribute. This project aims to reduce this risk to the nation by developing an electronic padlock that can raise an alarm when disturbed. In addition the access code can be changed at a moments notice or as soon as the pin is compromised by a staff leaver. The ability to control and monitor what's happening to critical infrastructure is seen by the industry as a major breakthrough for security. With the advent of the Internet of Things the ability to link an incursion or break in to other security intelligence systems will make tracking and detection of intruders more likely. This project makes use of IoT technology to ensure future connectivity is a given. Protrack will use a new patented to build in the tamper alert functionality that will open up new horizons unobtainable by conventional dumb locks. The project will also address the wider integration of security systems to the Smart City.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Avanti Conveyors Ltd	Remote Central Palletising (RCP) in the Corrugated Packaging Industry	£592,900	£250,000
Project description - provided by applicants			
<p>This project aims to develop an innovative palletising solution that will be faster, more flexible, with a smaller physical footprint, delivering significant economic and safety benefits to the corrugated box industry. World demand for corrugated boxes is forecast to increase 4.2 percent per year to 234 billion square meters in 2017. In Europe the Corrugated Board industry production is approximately 42 billion square meters per year with the industry comprising 420 companies and 686 production plants. In corrugated box plants, flat sheets of corrugated board are fed in stacks/piles to converting machines. These converters print and cut out the boxes. On exiting the converter, the sheet is split in a separator with the finished goods packed in individual bundles of 10 to 100 pieces per bundle, depending on the product type and sizes. These bundles are then configured on pallets in patterns in accordance with end user requirements. There is a need in the industry for ever increasing flexibility and quality of production; boxes are now used as a marketing tool requiring higher quality boxes and printing definition; with order sizes reducing reflecting more rapid/frequent end user product/promotion changes (job changes are therefore frequent, a few times/hr, with converter adjustment taking 10-20 minutes, also requiring set up of the separator and palletising device). Based on industry observation, converting equipment therefore currently runs at 30-50% of maximum capacity. The proposed development - Remote Central Palletising (RCP) - eliminates the automatic or manual palletising at every converter line, and centralises these operations in a specific RCP area, away from the converting lines. This in turn allows converters to run at maximum capacity rather than at a rate dictated by the peripheral equipment (as is currently the case). As a result of this development it is estimated that productivity could be increased by 15% through the adoption of RCP</p>			

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European EMC Products Ltd	European EMC Products Ltd: Development of electronics disabling system	£462,087	£207,939
Project description - provided by applicants			
European EMC Products (EEP) are market leaders in the provision of electromagnetic (EM)shielding products. Through their pioneering work in this field, EEP have identified an opportunity to create a military-level non-lethal weapon that utilises a fast rise Electromagnetic Pulse (EMP); this could be used to disable electronics in enemy targets such as drones, or vehicles being used to attack perimeter security.			

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User Replay Ltd	UserReplay Analytics machine learning project	£554,854	£249,684
Project description - provided by applicants			
<p>Websites are never perfect. They are complex systems and are prone to technical errors. They are used by human beings, who do not always behave in expected ways. When humans meet software, there will always be a certain amount of trouble. Up to 25% of users struggle when they attempt to make purchases online, and as a result many become frustrated with a website and leave without purchasing. Such struggles are believed to cost the UK economy over £1bn due to abandoned online transactions (source: Experian). Companies are increasingly trying to understand the struggles faced by the customer. Digital Customer Experience Management (Digital CEM) solutions have been developed to address this huge business problem. Digital CEM is based on recording user journeys, storing them for analysis, and enabling journeys of interest to be visually replayed alongside technical diagnostics. The resulting insight allows the online retailer to achieve higher sales by a decrease in the number of abandoned transactions. UserReplay Limited was founded in 2009, and specialises in "session replay technology" designed to allow web developers to record, re-run and analyse a visitor's journey through a website. This service is intended to measure and optimise the digital experience. We are able to find and fix site bugs, resolve disputes, recover abandoned baskets and prevent fraud online. This project seeks to develop a prototype solution which takes the analytical functionality of our existing Digital CEM to a completely new level through the use of data mining and machine learning to automate the process of discovery and diagnosis of customer experience issues, a process which even with the best tools has previously required a highly trained analyst. In doing so, substantial R&D will be necessary to resolve technical uncertainties. The resultant system will provide a step change in capability which will mark it out from existing alternatives.</p>			

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Hoxton Analytics Ltd	Hoxton Analytics footfall counter prototype	£362,819	£160,000
Project description - provided by applicants			
Development of the hardware and software relating to a system that accurately counts footfall and profiles demographics based on the shoes a person is wearing. The system consists of a hardware element including a camera, processor and communications equipment, and a software infrastructure including communications and databasing, and innovative algorithms that detect and profile people based on their footwear.			

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Mediatonic Ltd	Mediatonic Limited - Catapult	£670,134	£250,000
Project description - provided by applicants			
<p>Global games grew from \$67b in 2012 to \$91.5b in 2015. During this period the industry shifted toward web-enabled & mobile tech; spawning many new market entrants. With that, business models such as Free-to-Play with In-App Purchases (IAP) appeared and developers began to operate their games as 'Live Services' where the largest games in these categories for mobile and PC frequently exceed sales of \$1bn/annum. Mobile devices, digital distribution and the rise of 'indie' developers created an excess of content (around 3m apps on Apple's AppStore and Google Play alone). This deflated store prices and forced companies to find new ways to earn revenue. In a Live Services approach, companies use web-enabled tech to continually provide new content and to engage customers for longer ' helping to grow lifetime revenue. Sources: Gartner, NewZoo, Statista, VentureBeat, Developer Economics</p> <p>Creating and supporting the new tech however, involves many set-up costs and technical know-how. The largest game studios are often leaders in 3D graphics, CPU performance and other client-facing tech but they are keen to pivot towards Live Services which present significant challenges. Mediatonic designs, develops and manages games for the world's largest publishers including Activision, Disney, Microsoft & Time Warner in the US and Europe; and DeNA, GREE & Square Enix in Japan. Our production experience across multiple live titles gives us a unique position to build an industry-leading technology platform to accelerate change in other companies. Our goal is to build an enterprise-level engineering solution that provides critical back-end Live Services for high-end games. Purpose built for large teams; Catapult will reduce costs and circumvent many fatal problems that developers find after launching their service. This project will develop a Prototype to demonstrate how this can be achieved and to validate the commercial potential.</p>			

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Cobra Seats Ltd	Pre-production prototyping of Cobra Seats Marine Suspension System	£277,673	£124,952
Project description - provided by applicants			
<p>The project is to develop and produce pre-production prototypes of new marine vessel seats based on a revolutionary suspension system for shock mitigation. This has been successfully demonstrated to deliver significant performance benefits at lower cost than existing technologies and thus has the potential to disrupt the current market. A patent has been filed. The pre-production prototypes will be used to further refine the suspension mechanism and product, gain valuable user experience insights from potential customers, and provide quantitative data on shock mitigation performance. The market for marine suspension seating is growing (estimated to be in excess of £60m with annual growth rates of up to 8%), driven by a healthy demand for new vessels and legislative pressure which is forcing boat owners and operators to improve crew conditions and reduce the damaging effects of wave impact transmitted through the vessel's structure and fittings. As a result of this project, a substantial market opportunity will be realised by Cobra which will benefit the UK economy, has significant export potential and important social and environmental advantages. Vitality, an important health and safety challenge will be addressed, resulting in fewer injuries and lost work time in the UK and globally (with annual costs estimated of between £257 million and £665 million in the UK alone). The project will also trial a novel production route which takes advantage of recent advances in mould materials and manufacturing technologies. If this production route is successful it will enable even lower cost production of the new seats and when technical and commercial viability is proven, it will help not only keep production in the UK, but expand domestic composite production in a market that is increasingly dominated by composites manufactured abroad in low labour rate economies.</p>			

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Itim Ltd	Providing Retailers with a Virtual Personal Shopping Assistant (VPSA) to Increase Engagement with their Regular Customers	£642,860	£225,000
Project description - provided by applicants			
<p>Retailers who have regular customers are seeing the internet erode brand loyalty, as it is easy for their customers to shop elsewhere. To reverse that they need to provide more personalised shopping services delivered by staff in a store. They recognise consumers are increasingly time poor and are presented by the internet with too many product choices. Retailers want to offer their valuable customers personalised services that provide customers with matched solutions without an increase in costs. Delivering that today is too labour intensive and expensive. We are looking to provide retailers a central cloud based Virtual Personal Shopping Assistant (VPSA) designed for retailers; which will provide their customers with personalised shopping services, delivered by staff in stores, creating the opportunity to upsell and cross sell in the store. This requires at its heart innovative technology which uses artificial intelligence and machine learning to match products to customers and links customers to store staff. Our feasibility and research gives us confidence that we can do this delivering excellent results.</p>			

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Innovate UK

Results of Competition: Smart Round 4 2015-16 - Development of Prototype
Competition Code: 1509_SmartRnd4_DOP

Total available funding for this competition was £7.29M from Innovate UK

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
Rinicom Ltd	VIDEO-MESH II	£458,106	£206,147
Project description - provided by applicants			
<p>Rinicom's VIDEO-MESH II proposes to develop a novel surveillance system, integrating HD dual optical-thermal cameras and a robust mesh communications system, to enable the distribution of multiple high-quality live video streams to authorised devices, real-time wireless broadband transmission and seamless access to video meta data and information exchange. VIDEO-MESH Development of Prototype (VIDEO-MESH II) will design and implement the new dual-cam system, as it provides direct device-to-device broadband communications and adds the network access point functionality, resulting in the ability to rapidly and effectively extend the network reach without requiring additional investments or modifications to the existing physical infrastructure. VIDEO-MESH II will deliver a technologically-innovative prototype that validates the system's network performance and scalability towards the dynamic connection of multiple information producers (e.g., dual-cam systems, third-party camera systems, remotely operated systems) and consumers (e.g., mobile stations, unmanned vehicles). Rinicom's VIDEO-MESH will be the FIRST EVER HD optical and thermal cameras supporting wireless mesh broadband networking, at a highly competitive price. It innovatively combines the added value of dual HD cameras in surveillance with Rinicom's proprietary mesh networking, COFDM robust waveform and smart video analytics to create a truly game-changing surveillance asset, supporting a seamless network of (mesh-compatible) interconnected systems that sustain high-throughput data sharing exchange, automatic detection and tracking and communications relay to third systems. VIDEO-MESH II cutting-edge innovation will impact the surveillance market, introducing a unique, high performing, adaptive, secure and cost-effective dual-cam mesh networking surveillance system that is beyond the current market state-of-the-art and delivers improved protection of citizens, critical infrastructures and border control.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Liquids Research Ltd	Metallic Magnetic Nanoparticles for Polymer Microbeads	£233,963	£105,283
Project description - provided by applicants			
<p>Polymer microbeads are uniform spheres of polystyrene which can be functionalised so that they will attach to proteins and other entities in blood plasma or other bodily fluids. The microbeads are impregnated with nanoparticles of magnetite, iron oxide, so that they can be separated using a magnetic field allowing quantitative analysis or assay. Microbeads are available in sizes down to 0.3µ but there is a demand for beads with sizes <0.1µ. At this size it is not possible to get a sufficient loading of magnetite so that the separation of the molecules can be achieved. The only way to increase the magnetic content is to use a metallic material where the magnetisation is 4 times greater. Liquids Research Ltd (LRL) has held discussions with Merck Chimie who are the largest company in the EU in the microbead market. They have sales in excess of ~300M/year in a world market approaching ~1B. We are told that there is a substantial and immediate market for metallic magnetic nanoparticles for inclusion in polymer beads. Metallic nanoparticles are generally unstable in air. Recent academic work indicates that metallic nanoparticles can be encapsulated in a carbon shell rendering them stable. LRL has undertaken a feasibility study funded by the Welsh Assembly Government through the SMART programme and we have reproduced this academic work confirming this result. The objective of this project is to scale up the production of metallic magnetic nanoparticles >20g batches which would fulfil the requirements set by Merck for production trials of polymer beads. There remain technical issues to be resolved associated with the particles fusing together on a production scale and the dispersion of the in styrene which can be polymerised. In the bio-medical field there are rigorous specifications for new materials which we will undertake using our ISO9001 accreditation. The achievement of a 20g batch size would be adequate for bead production as the demand is 1kg/year.</p>			

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Skim It Ltd	Skim.it Development of Prototype	£556,144	£250,000
Project description - provided by applicants			
<p>It is generally agreed that there is an overload of information being shared in business organizations. Internal communications have suffered dramatically in recent years with an explosion in published content, and a resultant lower employee engagement. Coupled with the popularity of Facebook, twitter etc is also feeding through into the business world, so staff now expect Enterprise Social software which does not impose any rigid structure on users; and is more collaborative. Some organisations have recognised this, but they have been ill-equipped to manage the resultant interactions and content. Finally, many organisations allow Bring Your Own Device (BYOD), but they then find it much harder to distribute content to such a wide variety of employee's tablets and smartphones. Skim.it Limited is developing a Natural Language Processing (NLP) API to improve the way we share and consume information online. The NLP technology will carry out semantic text calculations of text heavy documents and web articles, and summarize them into short skim readable snippets, called Skims. Giving the reader a clear overview of an article's content, allowing them to determine the relevance of the article, and whether to continue reading in full. Our technology will be offered to the business market within our own application and as an API to aid the visualization, exploration and dissemination of an organisation's native content. This project builds on the success of a recent Smart Proof of Concept grant. We have a strong management team with experience in building startup businesses to multi-million dollar exits, and a technology team who include renowned Natural Language Processing professors. Our board of advisors include Vice Presidents of large enterprises, and top University Professors.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Spend360 International Ltd	ORAC	£515,104	£231,797
Project description - provided by applicants			
<p>The aim of the ORAC development project is to advance the results drawn from the InnovateUK Proof of Concept research project. That research into the use of machine learning (specifically neural networks) techniques has shown that Spend360 can significantly improve the accuracy of data classification within a spend analysis system. This enables effective cost reduction and supplier management by providing detailed all-round insight into procurement spend by an organisation. Currently these systems are heavily dependent on human interaction and require considerable domain-specific knowledge therefore accurate automation is essential. The current state-of-the-art for automated data classification in such systems is only 50%-70% accurate and so requires considerable human intervention to complete the task (this also assumes the auto classification is capable of addressing a wide range of market sectors). Research by Spend360 has shown that when these new machine learning approaches are combined with other techniques, an accuracy of >95% could be achieved. The innovation will be based upon a variably-sized, multilayered neural network approach: specifically using a general purpose Long Short Term Memory (LSTM) network to map invoice descriptions (sequences of words) to UNSPSC codes. The primary benefit that will accrue from this new innovative approach is that it will significantly reduce the human involvement in the classification process and associated data quality assurance. This will significantly reduce the time to complete the classification and improve the accuracy. Together, this will result in cost reduction of the solution thereby enabling adoption by a range of organisations that find the current associated service costs too high. Furthermore, the automation will enable an organisation to undertake more detailed and varied forms of spend analysis so trend analysis can be used to identify ways in which the spend profiles can be further optimised.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CSols Ltd	Game changing software for Analytical Instruments: Real impact in a \$100bn pa market.	£552,771	£248,746

Project description - provided by applicants

Analytical laboratories (Labs) test samples to determine what is in them. A wide range of sophisticated Intelligent Instruments do this work. It is ~ \$100bn pa global market. Instruments (typical cost £30k-100k) are controlled by proprietary software running on attached, dedicated PCs. There are millions of such systems globally. They produce numerical results (e.g. Zinc concentration is 4.6). Usually automated, each generates hundreds/thousands of results/day. Depending on what is being measured, they use different techniques (e.g. spectroscopy) by which the market is segmented. Instrument software is effective at generating results, but it is not optimized for maximum operational efficiency in the Lab environment. Through leading edge technical innovation, critical use of what are known as software agents (collections of autonomous software systems that collaborate to perform some task), 30 years of global domain expertise and a novel approach, we will maximize instrument efficiency. This proposal is for the creation of radically designed, prototype software, Instrument PC Essentials (IPCE), that will: Get a new instrument into service faster with higher ongoing availability and throughput. Produce results at dramatically lower costs, with better quality and get them to the Lab's customers quicker. The aim is for Vendors to ship IPCE preinstalled on instrument PCs. So the software must: Be of low enough cost to effect minimally the end user instrument price. Work 'straight out of the box'. Be so compelling in its benefits to Lab users, that it shifts the competitive balance towards instruments that use it. Savings from using IPCE are such that for most it would: pay for itself AND the instrument in its lifetime provide highly significant quality, speed and usability benefits. IPCE technology will shift the competitive landscape for Vendors through providing huge advantages to their users. It will be disruptive in a \$100bn p.a. marketplace.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
NeuDrive Ltd	FlexOS - Industrially scaling a novel material and process technology for fully flexible and printable organic electronics	£548,547	£246,846
Project description - provided by applicants			
<p>Plastic displays based on flexible printed electronics are predicted to revolutionise the performance, product differentiation and cost of novel device form factors. Whilst existing rigid screens can benefit from a step change in weight, thickness, ruggedness, power use and useable lifetime, displays that can be repeatedly bent, folded or rolled will be critical components in applications such as wearable devices. However, despite established front plane technologies such as OLED showing the required flexibility and long-term performance for dynamically flexible displays (DFD), a corresponding fully flexible backplane technology to drive the display output is yet to be realised. NeuDrive Limited have developed a novel OTFT form factor and fabrication process based on FlexOS (trademarked) - a proprietary OSC formulation based on soluble small molecules/high permittivity semiconductor binders - with world-leading mobility, stability and uniformity performance validated for flexible display backplanes. However, the current pilot scale process is not fully compatible with OEM production line equipment/materials and NeuDrive therefore seek to realise an enabling industrial process technology for economic manufacture of FlexOS-OTFT, underpinning a robust supply chain for DFD backplanes. The project aims to develop new process technology and proprietary passive materials to support immediate adoption on OEM production lines.</p>			

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