

**Catapult Researchers in Residence (RiR) Programme:
Opportunity Description**

Digital Manufacturing

Name of the Catapult(s)	Digital Catapult High Value Manufacturing Catapult
Location(s)	London and/or relevant HVMC centres
Description of the Catapult(s)	<p>The Catapult centres are a network of not for profit world-leading centres designed to transform the UK's capability for innovation in specific areas and help drive future economic growth.</p> <p>Digital Catapult accelerates business access to new digital markets and carries out applied research and development to identify new applications of emerging technology, helping scale up digital companies and supporting traditional businesses to make better use of new and emerging digital technologies. https://digicatapult.org.uk/</p> <p>The High Value Manufacturing Catapult (HVMC) is one of a network of elite technology and innovation centres established by Innovate UK as a long-term investment in the UK's economic capability.</p> <p>Applying business-led research, Catapults help businesses transform great ideas into valuable products and services to compete in the global markets of tomorrow.</p>
Description of the Challenge	<p>This challenge is aimed towards researchers interested in, or who want to understand, the crossover between the Digital Catapult and High Value Manufacturing Catapult interests, to create a paradigm shift within endless possible markets and application areas.</p> <p>To help spark application ideas, the below list outlines the focus areas for both the Digital Catapult and High Value Manufacturing Catapult. The project should be aligned with one or more of the interests of the Digital Catapult and High Value Manufacturing Catapult.</p> <p>The Digital Catapult focusses on four main technology areas: Immersive Technologies (VR/AR/MR), Artificial Intelligence (AI/ML), Future Networks (IoT, 5G, LPWAN) and Future Focus (Cybersecurity, Distributed Ledgers, Blockchain and Smart Contracts). Key markets sectors for the Digital Catapult are the Creative Industries, and Digital Manufacturing.</p> <p>HVMC is addressing the following key strategic themes :</p> <ul style="list-style-type: none"> • Digital manufacturing • Robotics and automation • Materials processing and new materials • Process engineering, biotechnology and biologics • Product design & verification <p>We would welcome any projects that focus on one of these layers or that fits within the scope of the 'Made Smarter' Review https://www.gov.uk/government/publications/made-smarter-review</p> <p>Some examples of projects we are interested are described below. We will however consider all projects that fall within the focus of both catapults:</p> <ul style="list-style-type: none"> • Distributed, ledger technology, or cybersecurity, or AI, or IoT in the supply chain. • Securing cyber-physical systems. • Protecting data integrity and fidelity across the production, supply and whole-of-life operational processes. • Secure and transparent data and reputation sharing across suppliers for agile supply chains.

	<ul style="list-style-type: none"> • Product Description and Information Management System (for both Production and Aftersales). • Smart Factory and Production Management System (Digital Twin Creation, Plant Simulation and Maintenance). • Smart Supply Chain Management and Distribution System (Manage flow between supplier, into the factory and distribution to customers). • Examining threats to the security of cyber-physical systems that run on the Internet, which exhibit emergent properties and could give rise to systemic instabilities. • Capture of Manufacturing knowledge: The application of digital technology to capture existing “good practice” from “good/trained employees” for the purpose of training the future workforce, augmented with robotics. • The impact of Distributed Autonomous Manufacturing : New business/enterprise models will be made possible through the exploitation of technologies such as factories in a box, fablabs, 3D printers, micro-factories, and makers spaces. There is potential for significant societal and economic change, and we would like to gain an increased understanding of the future landscape that might result. • Very Low Cost, centimetre-accuracy, positioning technologies to locate assets (inc human workforce) in danger zones : In modern workplaces, factories and industries, it is difficult to locate and track assets and people in real time with accuracies of approx. 1m indoors, and 10m outdoors. Solutions like GPS, RFID, Bluetooth, UWB are typically either too expensive, too power hungry for extensive life if battery powered, or lacking the requisite accuracy. We would like to research this problem and to cover first the existing solutions, and then to investigate and identify future technologies (eg very low cost GPS based on printed electronics) and understand their feasibility as replacements for conventional GPS and RFID tags in an industrial setting. • AI & Edge Computing: It is predicted that by 2020 more than five million smart sensors and other IoT devices will be in use around the world, and these devices will generate at least 507.5 zettabytes of data. Edge computing combined with AI/ML algorithms may help organizations to handle this volume of data. We would like to gain a greater understanding of the tools for implementing such systems. <p>Please contact us to discuss your project idea before you submit your application. This will ensure that it will be within the focus areas of both Catapults.</p> <p>catarina.fernandes@digicatapult.org.uk</p> <p>mike.hinton@hvm.catapult.org.uk</p>
<p>Researcher Specification</p>	<p>For this call, we are following EPSRC Eligibility Criteria.</p>
<p>Other Details</p>	<p>The aims of the Researchers in Residence (RiR) programme are to build connections, support pathways to impact, and knowledge exchange between academia and the Catapult centres.</p> <p>The output of this residency would include a report, and depending on the project, could include a prototype system to demonstrate the principles of a larger project.</p>
<p>Closing Date for Applications</p>	<p>17:00 (GMT) Friday, 21 September 2018</p>