Catapult Researcher in Residence (RiR) Programme: Opportunity Description

Digital twins through the supply chain

Name of the Catapult(s)	Future Cities Catapult (FCC) Digital Catapult (DC)
Location(s)	London and/or DC's local centres
Description of the Catapult(s)	The mission of Future Cities Catapult is to advance urban innovation, to grow UK companies, to make cities better. We bring together businesses, universities and city leaders so that they can work with each other to solve the problems that cities face. From our Urban Innovation Centre in London, we provide world-class facilities and expertise to support the development of new products and services, as well as opportunities to collaborate with others, test ideas and develop business models. We focus on healthy cities, urban mobility and integrated urban infrastructure, including connectivity. 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/ Applying business-led research, Catapults help businesses transform great ideas into valuable products and services to compete in the global markets of tomorrow.
Description of the Challenge	This challenge is aimed towards researchers interested in, or who want to understand, the crossover between the Digital Catapult and Future Cities Catapult interests, to create a paradigm shift within endless possible markets and application areas. To help spark application ideas, the below list outlines the focus areas for both the Digital Catapult and Future Cities Catapult. 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 **The Future Cities Catapult has four main focus areas, Digital Planning, Urban Mobility, Housing and Air Quality.** **Some examples of projects we are interested are described below. We will however consider all projects that fall within the focus of both catapults:** The current trend of outsourced globalised manufacturing and production puts intense pressure on the long-term sustainability of our planet's resources and environment.

A more effective orchestration of distributed local resources, manufacturing capabilities, material and logistic flows could enable a shift to more efficient localised urban production models and increase the competitiveness of our industry to respond to local demand.

Emerging digital infrastructure and manufacturing tools can provide the ability to configure manufacturing supply chains more dynamically across distributed production sites and optimise the overall use of resources and capabilities within and across cities and urban areas.

A critical component in enabling such optimisation are digital twins that reflect accurately the material flows within cities, last mile logistics, available resources and manufacturing capabilities and match these to the current demand locally and within partnering urban areas.

However, a digital twin might identify locations within a city or urban area for distributed manufacturing but currently the land use planning process may not consider these places suitable for manufacturing, plan for their impact nor allow planning applications for manufacturing in city centres.

Digital and Future Cities Catapults are keen to explore the idea of "digital twins" through the supply chain and into use and service for manufactured components or the built infrastructure. In the context of future visions of more distributed and autonomous manufacturing models, just in time supply networks, more production nearer points of consumption and evolving product design processes, we are looking to assess market and business opportunities and implementation challenges across industry sectors. The processes can include but are not limited to: site appraisal, design and planning, construction, quality assurance (in the factory), supply chain logistics (leaving the factory & distribution), final assembly, product distribution (retail), products in service / in use.

A variety of projects will be considered relevant to the missions of both Catapults, but we expect to see proposals addressing market demand, comparing different sectors or geographies, assessing the current state of play, economic or management models or challenges, service design or user experience studies, technology architectures or components or other related topics.

Please contact us to discuss you project idea before you submit your application. This will ensure that it will be within the focus areas of both Catapults.

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Researcher Specification	For this call, we are following EPSRC Eligibility Criteria.
Other Details	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.
	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.
Closing Date for Applications	17:00 (GMT) on Fri 21 September 2018

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