Summary
The Economic and Social Research Council (ESRC) and The Alan Turing Institute are pleased to announce the second round of a Joint Fellowship Scheme aimed at driving forward the development and application of cutting edge data science to study major societal challenges.

This second joint call will focus on three key application areas where data-intensive digital technologies could bring advances in delivery and innovation - Financial Services (FinTech); Public Policy and Government; and Urban Analytics, covering areas such as:

- machine learning and artificial intelligence
- blockchain technology
FinTech is viewed by many as potentially transformative for the financial services industry, with major implications for established business models, financial networks and trading platforms. Likewise, government is a major holder of data which data science could harness to improve dramatically the design and provision of public services as well as informing public policy-making and innovation across all levels of government. Research in urban analytics has the potential to contribute both to the basic science of cities and to enhance urban planning, taking into account the transformation of services through companies such as Amazon and Uber, and the priorities of sustainability and climate change.

However, maximising the potential gains and minimising the potential costs for citizens, consumers, government, businesses and the wider economy will depend on how the new technologies are applied. This raises important questions for issues such as regulation, resource allocation, risk management, financial inclusion, social and economic development, access to justice, equity, privacy and trust. These issues need to be addressed through interdisciplinary research which includes the social sciences as well as the core research areas - maths, computer science and ‘big data’ analytics - on which the new technologies are based.

Proposals are welcome from mid-career and senior social scientists from an eligible UK Research and Innovation (UKRI) Research Organisation (RO) (https://www.ukri.org/funding/how-to-apply/eligibility/) with an interest in data analytics and associated fields and one or more of the three application areas specified. Up to two studentships will be attached to each Fellowship and it is expected that these will work in cognate areas to that of the Fellow.

Students must meet standard ESRC academic and residential eligibility requirements. Further information on eligibility can be found on the ESRC website: https://esrc.ukri.org/skills-and-careers/studentships/prospective-students/am-i-eligible-for-an-esrc-studentship

Fellows are invited to submit proposals for up to 36 months. A minimum of 50% time commitment over the period of the grant will be required from the Fellow.

The ESRC will fund 60% of the Fellow’s salary at 80% fEC and the RO is expected to fund the remainder of the salary cost of the time committed to the Fellowship. (Please refer to the FAQs document for further details.)

Proposals need to be submitted to the ESRC by no later than 16:00 on 5 September 2018.

After peer review, successful applicants will be invited for interviews which will take place on 25 October 2018.

Funding decisions will be available from mid-November 2018 and the Fellowships are expected to start no later than 1 April 2019.
We are anticipating supporting up to three fellows, dependent on the quality of the proposals.

**Background and scope**

The Alan Turing Institute (Turing) is the national institute for data science and artificial intelligence, headquartered at the British Library.

Five founding universities – Cambridge, Edinburgh, Oxford, UCL and Warwick – and the UK Engineering and Physical Sciences Research Council created The Alan Turing Institute in 2015 in order to drive forward both the theoretical development of data science and its practical application to real world problems. Eight new universities – Birmingham, Bristol, Exeter, Leeds, Manchester, Newcastle, Queen Mary University of London and Southampton – joined the Institute in 2018.

Further information on the Institute’s work can be found at [https://www.turing.ac.uk/](https://www.turing.ac.uk/)

The Turing is committed to interdisciplinary research. It aims to be peopled by a wide range of scholars with an interest in data intensive research who will work together to tackle scientific challenges.

In 2018 the Turing published eight research challenges which will be used to drive its research ([https://www.turing.ac.uk/research/](https://www.turing.ac.uk/research/)). These challenges are indicative of wider areas of science we will work in and are underpinned by a set of core capabilities.

The Institute’s research is underpinned by a number of major research programmes in engineering, defence and security, health, economic data science, AI, public policy and data science at scale. It expects to introduce programmes in Urban Analytics and Data Science for Science later in 2018.

The ambitions of the Turing align very closely with those of ESRC which has a long-held strategic objective to strengthen quantitative and data science skills across the UK social science research base. The growing advent of big data and the need to look at new ways to analyse such data has added further impetus to the need to build new research capacity in this area. A partnership with the Turing is seen as an integral and innovative part of this broader strategy.

As the UK’s national institute for data science and artificial intelligence, the Turing Institute is well placed to take a leading role in the use of data science to address modern questions in public policy, urban analytics and financial services.

The fellow will benefit from being able to interact with leading scholars from a variety of disciplines, including statistics, computer science, and economics, as well as software engineering expertise. The Institute’s strategic partnership with HSBC (which underpins the economic data science programme) also brings the possibility of collaborating with a leading global financial institution on the questions of interest, while the programme in public policy (and later, urban analytics) bring in partnerships with departments and agencies from across the public sector.
Each award recipient will be entitled to the benefits of a Turing Fellow for the duration of the award period, which include:

- access to work space at the Institute
- Intel cloud credits
- support from the research facilitation and partnerships team in developing the project
- eligibility to apply for seed core funding, and
- opportunities for collaboration with Turing Fellows from across a network of 13 universities.

**Call details**

The ESRC-Alan Turing Institute Fellowship Scheme is looking to appointment fellows in the following areas:

**Financial Services**

FinTech is viewed as potentially transformative for the financial services industry, with major implications for established business models, financial networks, and trading platforms. These technologies are at different stages of sophistication and maturity; whilst much is written about the potential revolutionary nature of distributive ledger technology (blockchain), for example, how this will actually impact on the industry remains unclear. On the other hand, less exotic applications, for example mobile technology, are already well established.

FinTech is seen as a source of competitive advantage for the UK which together with Ireland was, according to the 2015 report by the Government’s Chief Scientific Advisor, the world’s fastest growing region for FinTech investment ([https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/413095/gs-15-3-fintech-futures.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/413095/gs-15-3-fintech-futures.pdf)). The Government’s stated position is to cement the UK’s leading position and to be a global hub for financial innovation. However, maximising the potential gains and minimising the potential costs for consumers, businesses and the wider economy will depend on how the technologies are applied. This raises important questions for issue such as regulation, risk management, financial inclusion, privacy and trust. These issues need to be addressed through interdisciplinary research which includes the social sciences as well as the core research areas - maths, computer science and ‘big data’ analytics - on which the new technologies are based.

Some potential research issues are set out below. However, these are intended to be illustrative and by no means exhaustive.

**Key research issues**

**Technological innovation, business models, data access**

- What are the main areas of opportunity offered by the adoption of the new technologies in the development and delivery of financial services? To what extent will the results take the form of transformative innovations in business models, resulting in radical reductions in costs and gains in productivity, the personalisation of existing services and products or the development of entirely new services which conceivably will cut across existing industry and product lines?
• What are the potential barriers to the successful adoption (technical or otherwise) faced by innovators and businesses in the financial services industry and how these might be resolved? To what extent is data availability and access an issue: how can access to quality data be improved? What scope is there for cooperation and data sharing across the financial service industry and its sub-sectors?

Industry structure, customer access
• Will new technology allow core financial services to be ‘unbundled’ and provided separately through genuinely disruptive new competitors, or alternatively provided directly by established players? Will there be a role for greater sharing of infrastructure?

• What are the core competitive advantages of banks and other financial services firms in this context? Is it the trust placed in them by customers (reinforced by regulation), their access to customer data or their role as managers of personal and corporate identity in financial transactions?

• Will technology result in integrated services provided within a single online/mobile environment or through a vertically separated “app store” model, with competition at one level between platforms to attract users, and at the other level between financial services providers offering their applications via these platforms?

• Will the emergence of new competitors and business models (for example, peer-to-peer lending, crowdfunding) substantially improve access to credit and equity funding to, for example, SMEs, or will this remain a relatively niche market? Similarly, can FinTech help improve access to financial services to the financially excluded (for example, through alternative approaches to credit risk scoring using new data and analytics) or alternatively will some be excluded from the digital economy for reasons of age, education, culture and social background?

Public policy, regulation and competition policy
• What should public policy be towards FinTech given stated government objectives for leadership in this sector? To what extent is this about creating a supportive environment for firms at the earliest stage of development, so as to encourage innovation and a strong supporting ‘ecosystem’ of technical, financial and regulatory expertise, or alternatively about reducing barriers to competition and innovation, and producing more efficient, less burdensome prudential and conduct of business regulation (which arguably protects incumbents).

• Is there a need for proactive intervention by competition regulators to limit the market power enjoyed by incumbent players? What form should this take?

• What are the trade-offs between stability, innovation and competition and how should this guide regulatory and competition policy?

• What are the prospects for RegTech, the employment of new technology to improve and reduce the cost of regulatory processes, in the context of the financial services industry?
Identity, security and trust

- Households, businesses and public services are now capturing and storing massive amounts of data. Who has control of this data? What permissioning is required to use it? Where does the responsibility for maintaining security lie? How do customers make the appropriate informed decisions on the trade-off between privacy and service?

- What is the best approach to establishing digital identity in accessing financial services? Should the aim be a single national or global identity or the integration of multiple identities working together? What is the role of financial services firms: passive users of identities or providers of identity services?

- To what extent is the shift to internet and mobile financial services solutions creating new security vulnerabilities (for example, cyber-attack, fraud) and how can these be best guarded against? Are major firms doing enough to communicate and understand the operational and business risks inherent in the new technology so as to be able to respond effectively to new challenges?

- How well do customers understand risks in the digital environment? To what extent should the obligation be on them (as opposed to firms or the regulator) to ensure their own protection?

Public Policy and Government Innovation

Data science and artificial intelligence could have a potentially transformative effect on the ways in which government makes policy and designs services. The Turing’s Public Policy Programme is working with policymakers across government to explore how data-driven public service provision and policymaking might solve long running policy problems and foster innovation in government.

Data science and Artificial Intelligence (AI) technologies might be used to:

- design personalised public services that are tailored to meet citizens’ needs and situation
- inform a fairer data-driven allocation of public resources
- identify policy priorities by modelling complex systems and scenarios
- track and evaluate hard-to-measure policy impacts
- make the decision making process more efficient and transparent

The programme is also working (with the Turing’s Data Ethics Group) to build the ethical foundations for the use of data science and AI in policymaking. Data-intensive technologies like machine learning introduce new challenges, including the question of whether and where predictive capacity can be used at the individual level, and new questions of transparency, privacy, equity and accountability in the use of algorithms to aid public sector decision-making.

Data science advances that the programme has already identified as important are as follows:

- agent-based computing
• machine learning, including the development of predictive capacity, and the identification and measurement bias
• behavioural insights, including natural experiments and regression discontinuity designs
• linking of data sources, such as the linking of transactional data and survey data
• modelling of volatility, risk and uncertainty

However, these areas are indicative rather than exhaustive and applications will be welcomed from researchers working in any application of data science to policy challenges.

Urban Analytics
Urban analytics – underpinning city planning and economic and social development – is a developing theme in its own right at the Turing I but will also have a cross-cutting role connecting to such Turing themes as Health, Defence, Finance and Data-Centric Engineering, and the Public Policy Programme.

Potential areas of research include:
• Information system design as the basis for urban analytics in the ‘big data’ age
• Mathematical and computer modelling in the context of data science and AI
• Applications in urban and regional planning, including infrastructure analytics

Research in urban analytics has the potential to contribute both the basic science of cities and the enhance urban planning – the latter in its land use role, but also extending into economic and social development, taking into account the transformation of services through companies such as Amazon and Uber, and the priorities of sustainability and climate change.

Main purpose and expectations of the Fellowship
The Fellowships are aimed at social scientists with interests in data analytics and associated fields who wish to draw on the resources and expertise of the Turing Institute to develop their knowledge of this area and explore the implications of potential applications in financial services (FinTech), public policy or urban analytics.

The main purpose of the Fellowship is to:
• develop an interdisciplinary research programme and conduct outstanding, creative and innovative research incorporating data science and the relevant social science, to develop internationally-significant outcomes through high-impact publications
• collaborate with others across Turing and the broader data science, artificial intelligence, and social science community, towards outputs and outcomes that yield significant academic, societal or economic impact
• play a role in advancing the strategic objectives of Turing and ESRC
• achieve research excellence as appropriate to the applicant’s discipline
• help build new interdisciplinary research capacity in data science and relevant social science through training of the proposed associated PhD students
• help broaden and deepen the interdisciplinary research base of Turing through building a critical mass of social scientists at Turing.

We want the successful candidate to use the Fellowship to:
• generate and pursue original research ideas, design and conduct a successful programme of investigation and develop innovative, world-class research
• publish research in high-quality peer-reviewed national and international journals and present research results at national and international meetings, conferences, seminars and workshops
• take part in knowledge exchange and/or translation activities as appropriate; such as collaborative working with Turing’s partners, or with government departments/policymakers, and on public engagement, policy events, and so on
• advance their own professional development, with support from Turing and the host partner university
• build additional interdisciplinary capacity in data science and social science through the supervision and training of PhD students.

To fulfil these duties the Fellow is expected to spend some time at the Turing headquarters in the British Library, London. This will involve participating in activities, research forums and sponsored events, and developing collaborative relationships across the Institute where beneficial to their research. It is hoped that the Fellow will engage with the Turing’s programmes of research (https://www.turing.ac.uk/category/research/programmes/), particularly the Economic Data Science programme (https://www.turing.ac.uk/research_projects/economic-data-science/); the Public Policy Programme (https://www.turing.ac.uk/research_projects/public-policy-programme/) and the nascent programme in Urban Analytics. Fellows will be expected to participate in the intellectual life of the programme, attending workshops and events sponsored by the programme, and engaging with the programme’s research as appropriate to their specialism. This range of activities is seen as critical to developing links and potential further collaborations, promoting multi-disciplinary thinking at the Turing, and in providing the necessary support for the PhD students that will be attached to the Fellowship.

Reporting requirements
In addition to the standard ESRC reporting requirements (https://esrc.ukri.org/funding/guidance-for-grant-holders/reporting/), a minimum degree of reporting to the Turing by the Fellow is expected on an annual basis. The Fellow will prepare and submit an annual summary of the progress made towards fulfilling the objectives of the Fellowship. The Fellow will meet with an appropriate representative from the Turing to review progress. A report on the conduct and outcome of the research must also be submitted by the Fellow within three months of the end of the award period.

Associated studentships
Studying at the Turing offers students a unique opportunity to undertake a data science-focused PhD in a multidisciplinary environment, where over 100 experts (https://www.turing.ac.uk/turing-fellows/) from different research disciplines work side-by-side to solve problems, generate ideas and transform research into real-world impact.

To help build new capacity in this rich environment and to increase social science research capability in data science, up to two studentships will be attached to each Fellowship proposal. It is expected that these will work in similar areas to that of the Fellow but must provide the opportunity for a distinct and independent course of enquiry for the student and the Fellowship should still be viable without the studentship. The Fellow will act as the primary supervisor helping in particular to develop the quantitative and data science skills of the students. Secondary supervisors may be from other ROs who form part of the Turing.
Students need to be registered on an ESRC Doctoral Training Partnership (DTP) [https://esrc.ukri.org/skills-and-careers/studentships/doctoral-training-partnerships/] or Centre for the Doctoral Training (CDT) [https://esrc.ukri.org/skills-and-careers/studentships/centres-for-doctoral-training/] training pathway at the same RO of the Fellow.

Students will be expected to meet the core social science training set out in the ESRC Postgraduate Training and Development Guidelines [https://esrc.ukri.org/skills-and-careers/studentships/doctoral-training-centres/postgraduate-training-guidelines/] (Annex 1). For students with a previous master’s degree, the DTP/CDT Management Board will be responsible for deciding if the student has met these requirements. For students who have not met these requirements, up to an additional year of funding (at the UKRI standard rate) will be provided to enable completion of a master’s that meets the core training requirements.

A Turing Doctoral Studentship is a 3.5 year programme inclusive of fees and stipend. A Turing student is expected to spend a majority of their doctoral studies at the Turing headquarters within the British Library. All Turing doctoral students may spend up to 30 weeks/3 terms at their host RO (requirements vary by RO) during their doctoral training.

A doctoral student receives:

- Doctoral stipend: the stipend will be paid at: £20,500 per year (subject to annual increases). This includes London Weighting and is higher than the standard ESRC stipend to ensure it is commensurate with other students at the Turing.
- Fees: will be paid at the UKRI level. Current fee levels can be found at: [https://www.ukri.org/skills/funding-for-research-training/]
- The student will be able to claim up to £2,600 for materials/computer purchase. All students are required to purchase a new computer as specified by the Turing to ensure compliance with their security requirements.
- The student will be reimbursed by the Turing for travel and subsistence to conferences, meetings and for training up to the value of £2,000 a year.
- The student will be able to claim a fixed allowance for travel, and where appropriate, accommodation between the Turing and host RO. This may vary depending on the location of the home institution.

For more detailed information on eligibility to apply for associated studentships and the terms and conditions governing them please see call specification Annex 1 (available at [https://esrc.ukri.org/funding/funding-opportunities/esrc-alan-turing-institute-joint-fellowship-scheme-2018/]).

**Fellowship funding**

We view these Fellows as a way of building data science skills across the social science base within the UK, and recognise that many ROs are already creating their own capabilities in this area. We therefore see this as an opportunity for the ESRC and the Turing to partner with those ROs. For this reason, it is expected that half of the salary costs of the Fellowship be met by the host institution.
The grant for the Fellowship will be issued and managed by the ESRC in accordance with our normal Research Funding Guide (https://esrc.ukri.org/funding/guidance-for-applicants/research-funding-guide/) and procedures as stated on the website. Proposals should be costed on a full economic cost (fEC) basis.

Turing will provide dedicated facilities for the Fellow and PhD students at its headquarters at the British Library, London.

Please note the following exceptions to the standard research funding guidelines:

**Fellow salary costs**
A minimum of 50% time commitment over the period of the fellowship will be required from the successful applicants. The ESRC will pay 60% of the Fellow’s salary costs that are associated with the Fellowship, at 80% fEC (this is commensurate with half the 100% fEC of the Fellows salary). The RO is expected to fund the remainder of the Fellowship-associated salary cost. (Please refer to the FAQs for further information).

**Travel and subsistence**
ESRC will allow travel and subsistence costs to be claimed for the commute between the host RO and the Turing. This will be dependent on the location of the host RO (please refer to the FAQs for further information).

Costs for travel and subsistence to attend conferences or events can also be claimed through the Fellowship. However, these must be integral to the Fellowship and not associated with any costs that may be covered by the Turing (see ‘Turing internal funding schemes’ below).

**Turing internal funding schemes**
In addition to costs submitted to ESRC through the proposal, the Fellow will also be able to apply, on a competitive basis, to the Turing’s internal schemes for the following costs:

**Visiting research in small groups**
The aim is to collaborate with researchers outside the Turing. There will be an opportunity to apply to the Turing for additional funding to support visiting researchers through their internal competitive schemes. A maximum budget of £4,500 per annum can be submitted for supporting visiting researchers.

**Turing external sponsorship workshop funds**
Funding of up to £3,000 per workshop is available to help support workshops that are running as part of an external event, for example a meeting or conference.

**Turing events funds**
Funding of up to £10,000 per workshop is available to support standalone data science and artificial intelligence events such as workshops, public engagement, seminars, summer schools, etc. Funds can be used for the travel and subsistence of external speakers and organisers, catering costs and consumables. In addition, researchers may request the use of the Turing event space, meeting rooms, and logistical support from the events team. All
proposals must be reasonably costed in accordance with available guidelines and all costs must be fully justified.

Applying through the Turing internal schemes will provide the successful Fellow with the same opportunities available to other Turing Fellows. Applications for internal funding schemes are measured for their impact against the Institute's expressed research priorities.

**Security screening**
Working at the Turing will allow access to the systems and information of both the Institute and its partners, misuse could carry significant risks in terms of breach of relevant data protection obligations and reputational damage. As the national institute for data science and AI, we take very seriously the appropriate protection of data and information, and the intent of the security checks is to undertake all reasonable steps to protect ours and our partners’ data and information. Everyone engaged with the Turing, including Fellows and PhD students and operations staff will undergo the same security checks before working here. The checks will be carried out via a third party organisation called Agenda Security Screening and will include the following components: identity confirmation, five year employment history, sanctions and Politically Exposed Person (PEP), deep web internet mining (Open Source Intelligence; OSINT), UK criminal check and Basic Disclosure Scotland (DBS). Any award will be conditional upon the Fellow and students agreeing to undergo and passing these checks to the satisfaction of the Turing.

**How to apply**
Proposals are welcome from mid-career and senior career academics who can demonstrate experience of supervising PhD students. Applicants must provide demonstrable evidence of their existing skills in the use of quantitative techniques and clearly describe how they envisage these will be developed by working at the Turing. The expectation is that the applicant will be able to show how their research programme will show impact through advancing scientific knowledge and direct application to real-world challenges.

The principal investigator should be from a research organisation eligible for ESRC funding. The host research organisation should also be part of a Doctoral Training Partnership ([https://esrc.ukri.org/skills-and-careers/studentships/doctoral-training-partnerships/](https://esrc.ukri.org/skills-and-careers/studentships/doctoral-training-partnerships/)) or Centre for Doctoral Training ([https://esrc.ukri.org/skills-and-careers/studentships/centres-for-doctoral-training/](https://esrc.ukri.org/skills-and-careers/studentships/centres-for-doctoral-training/)).

Proposals need to be submitted to the ESRC by **no later than 16:00 on 5 September 2018.**

All proposals **must** be made on the [Je-S Proposal Form](https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx), which is available at: [https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx](https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx).

Je-S is the electronic submission system which is used by all research councils to provide a common electronic system that supports research administration. More detailed information can be found at [https://je-s.rcuk.ac.uk/](https://je-s.rcuk.ac.uk/). In particular, applicants should note the registration requirements for making a Je-S submission. Please also refer to the Je-S Guidance for this scheme in conjunction with this Call Specification.
Only those proposals submitted through the Je-S system will be accepted for processing. The proposal submitted through Je-S will be taken to be the final version, and will be the version used for external peer assessment.

What we will do with your information
In accordance with General Data Protection Regulation (GDPR) the personal information that you provide within the proposal will specifically be used for the purpose of administering this call. The information will be viewed by ESRC and the Turing staff and selection panel members, and your information will not be used for any other purpose without your specific consent.

For further information on how your information is used, how we maintain the security of your information, and your rights to access information we hold on you, please contact the Joint Information Services Unit (jisu@epsrc.ac.uk).

Commissioning timetable
- Open date for proposals – 5 June 2018
- Closing date for proposals – 16:00 on 5 September 2018
- Interviews and panel meeting – 25 October 2018
- Fellowship Start Date – 1 April 2019
- Studentships Start Date – 1 October 2019

Contacts
If you have any questions or would like further information about the scheme, contact:

- Claire Dyball
  Email: esrcturing@esrc.ukri.org
  Telephone: 01793 413003

Enquiries relating to technical aspects of the Je-S form should be addressed to:
- Je-S helpdesk
  Email: jeshelp@rcuk.ac.uk
  Telephone: 01793 444164