

Robotics & AI: A brighter future

Thurs 10th Dec 2020

Dr. Caroline Chibelushi

www.ktn-uk.org

The KTN logo is displayed in a bold, black, sans-serif font. It is positioned on the right side of the slide, set against a large, semi-circular background that transitions from a dark green at the top to a bright green at the bottom. The letters 'k', 't', and 'n' are lowercase and connected, with the 't' having a distinctive shape where the top bar is slightly offset to the right.

ktn

Outline

- KTN
- RAI Innovation Networks
- AI in general
- Not only covid-19, 2020 had other problems
- RAI to reduce Covid-19 threats
- Spending Review -2020
- Funding opportunities

The Innovate UK Family

Funding



UK Research and Innovation



Collaborate



Connect

Knowledge Transfer Partnerships





KTN

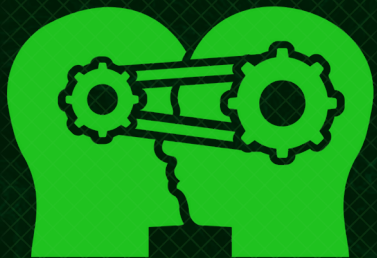
Connecting for Positive Change

KTN connects ideas, people and communities to drive innovation that changes lives.

ktn



KTN in Numbers



953

New business to business (B2B) and business to research (B2R) collaborations in 2018/19



38,895

Organisations in our network



£13.50

Investment Multiplier- For every £1 invested in KTN, more than £13.50 is generated for the UK economy



32,867

Delegates attended our events (up to 17% on previous year)



55,613

We have 55,613 active newsletter subscribers

Robotics & AI Innovation Network

Connecting innovators, end users and funders
to accelerate ambitious robotics and AI ideas
into solutions for real world problems



Focus Sectors

Accelerating the uptake of Robotics & AI in these key sectors:



Healthcare



Agri-Food



Infrastructure



Manufacturing



Waste
Processing



Robotics & AI Innovation Network

- Free membership
- 1.5k subscribed members across the UK
- Communications, online resources, events
- Platform for knowledge sharing and networking
- Raising awareness of UK capability
- Accelerating innovation and adoption

Publishing

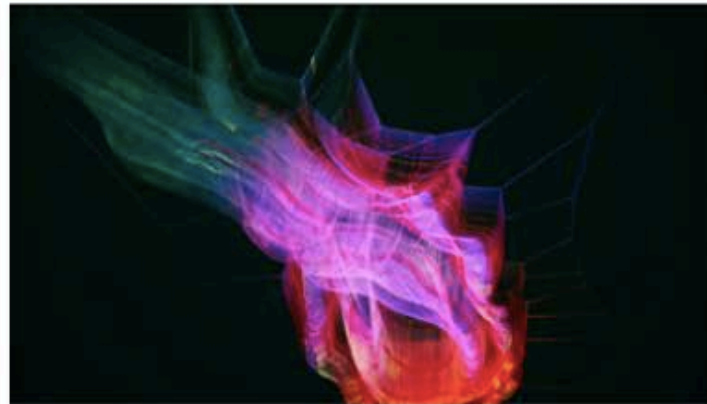
We are keen to make our RAI community aware of the opportunities available to them in areas which they may not think of



23.04.2020

Is AI ready to reduce Covid-19 threats today?

Dr. Caroline Chibelushi, KTM for AI, presents her views on the capabilities of AI in helping us deter present and future threats due to Covid-19.



21.04.2020

The Traditional ROI Measure is not for AI

Dr. Caroline Chibelushi, KTM Artificial Intelligence, shares her thoughts on the challenges of measuring the return on investment for AI.



18.07.2018

How the cut flower industry could use artificial intelligence to help businesses grow

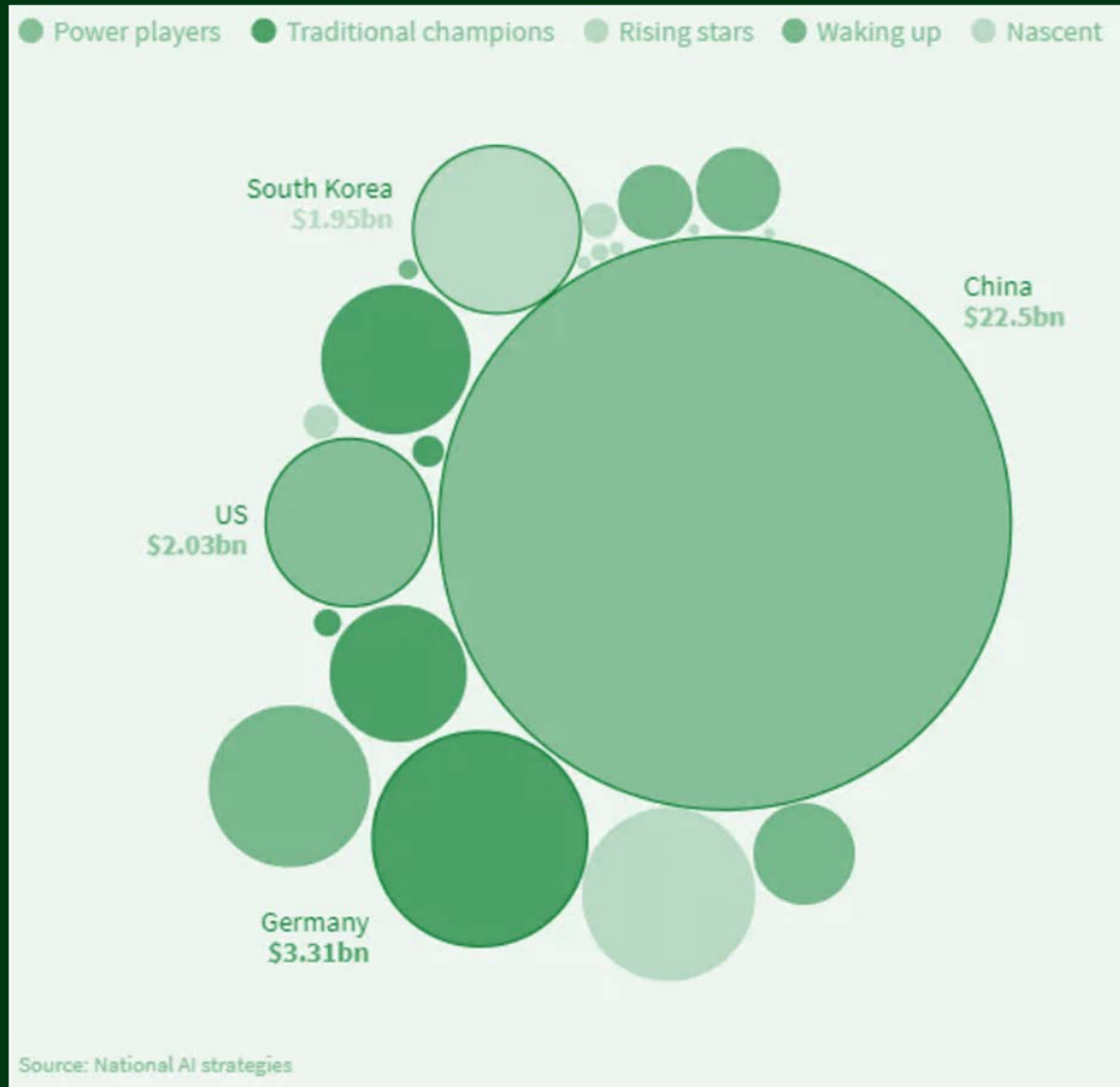
KTN's Knowledge Transfer Manager for AI, Caroline Chibelushi has been looking at the

External Publications

Chibelushi, C. (2020). AI & Prediction of Future Pandemics. Re Work: How can we leverage AI for pandemics?. Whitepaper 2020.

AI in General

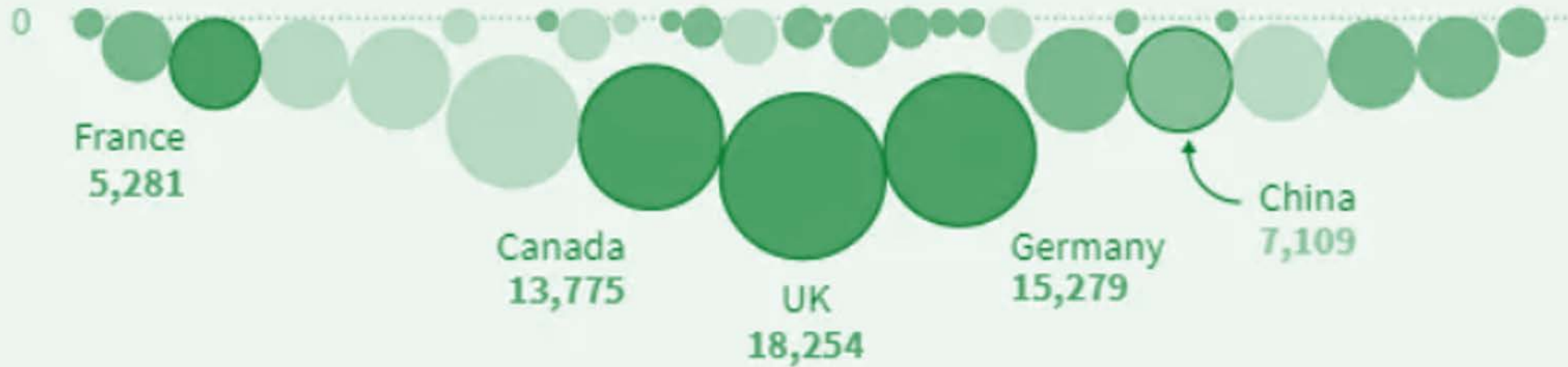
Government Investment in AI



Research and Publications

Number of articles published by top-rated AI experts

● Power players ● Traditional champions ● Rising stars ● Waking up ● Nascent



Rising stars and traditional champions benefit from a wealth of talent.

Image: Tortoise Intelligence

**UNDERSTANDING MACHINES:
EXPLAINABLE**



Explainable AI

- **Reduces:**
 - Bias
 - Job losses
- **Supports** the development of meaningful AI standards
- **Complements** and does not replace human workers
- Expected to **dominate** AI landscape in the next **three years**
- Avoid AI *black boxes*
- Expect **high** levels of human **scrutiny**

AI to predict Fire, Floods and Earthquakes

Complexity of Fire Prediction

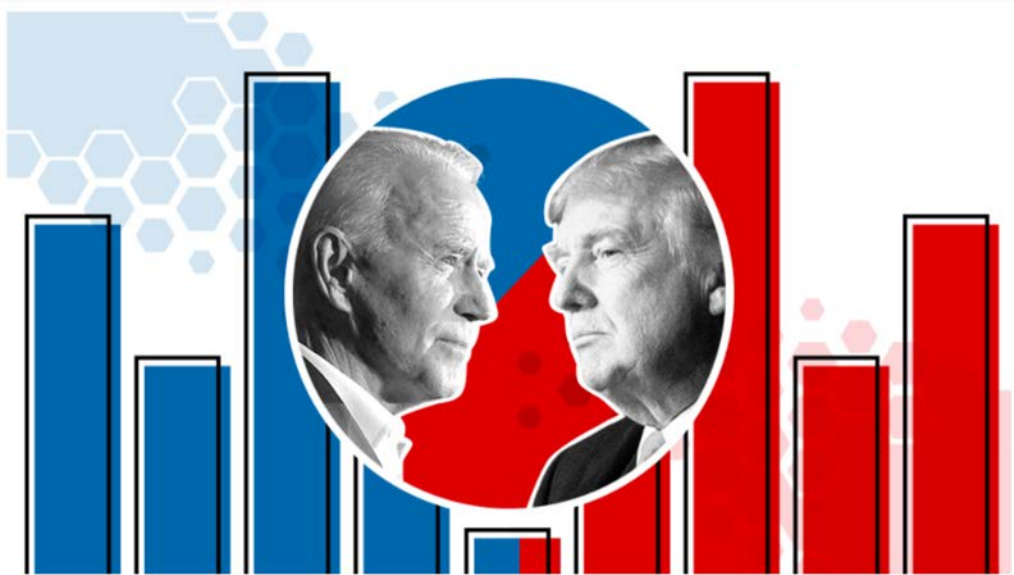
The New South Wales government has announced it will be investigating how **artificial intelligence**, combined with **data** from **satellites** and local **sensor networks**, can be used to help speed up **bushfire detection** and **predict fire behaviour**

We are investigating further how we **use the data from multiple satellites** and **local sensor networks** to create algorithms that will help detect fires earlier, **predict fire behaviour**, and help emergency services **respond more effectively** to protect homes, people and nature.

Factors affecting Fire prediction:

1. Atmospheric Conditions
2. Fuel Load
3. Soil Moisture
4. Availability of Water

AI to Strengthen & Defend Democracy



Traditional Polling is outdated

QUESTION:

Is there a more accurate way to project election results than traditional polling, which mostly relies on telephone calls and online panel surveys?



Democracy & The Internet

Further growth of gigantic Internet platforms like Amazon, Apple, Facebook, Google, and Twitter

- Dominate the dissemination of information
- Coordination of political mobilisation

AI has a role to play

- Encourage competitive middleware

AI to Reduce COVID-19 Threats



Can AI predict the next epidemic?

Prediction of pandemics is long overdue, we have data, research, technologies and a long history of zoonoses to the extent that July 6 is World Zoonosis Day, which commemorates the work of French biologist Louis Pasteur, who successfully administered the first vaccine against rabies, a zoonotic disease, on July 6, 1885. There is no reason for not predicting COVID-19, but there is a reason to predict the future pandemics – Caroline Chibelushi

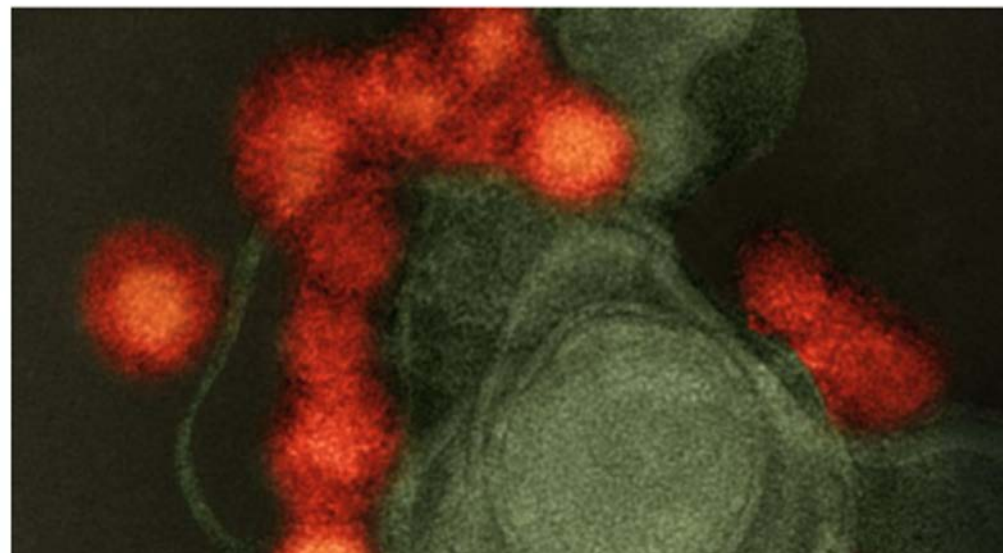


Can AI predict the next epidemic?

- **Predicting/identifying** the virus host early can help **prevent the spread** to humans
- **Currently**, this work is done **manually**.
 - It takes years of intensive field research and laboratory work

Machine learning tool can predict viral reservoirs in the animal kingdom

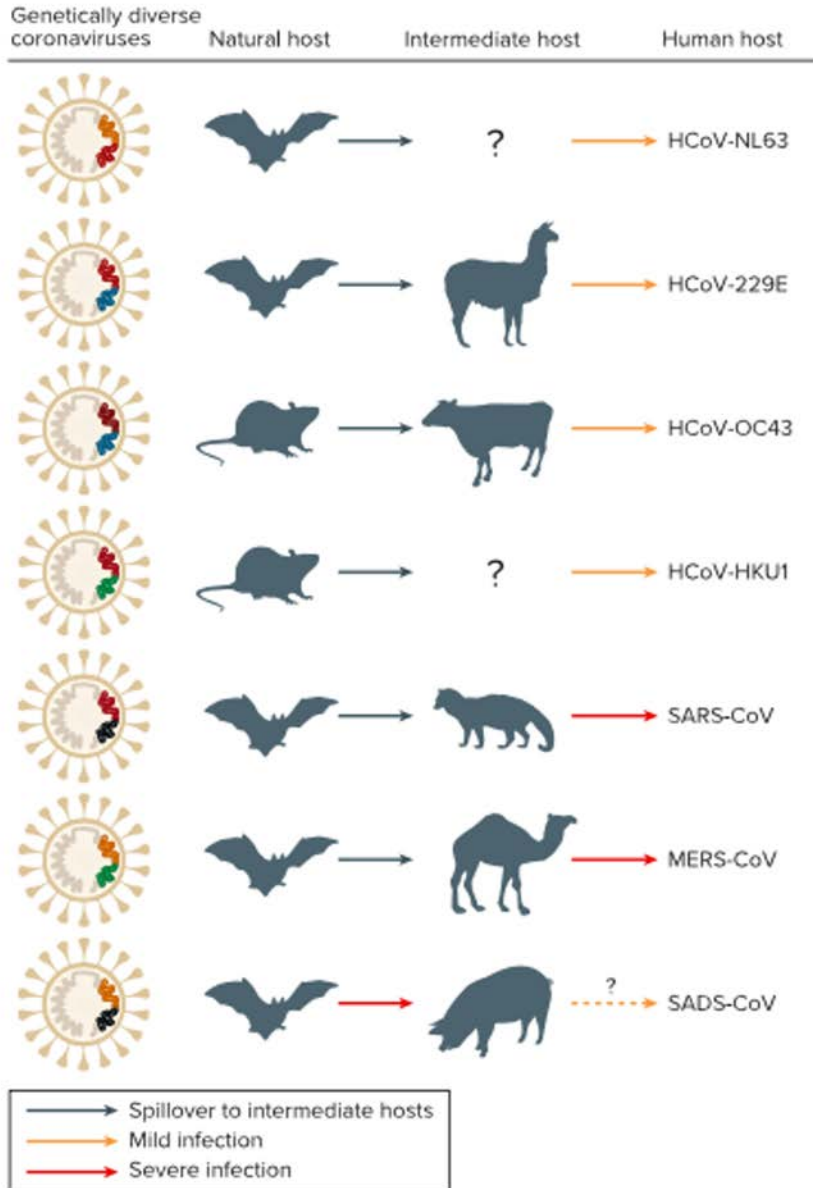
by University of Glasgow



Can AI predict the next epidemic?

- A new machine learning algorithm has been designed to use viral genome sequences to **predict** the **likely natural host** for a broad spectrum of **RNA viruses**, the viral group that most often **jumps from animals to humans**.

Past coronavirus spillovers and their origins



AI can support Scientists

- **Bats** uniquely carry a **number of high-profile viruses** and appear to tolerate them and their symptoms
- The **reason** for this is **not well known** and our knowledge on bats is still very limited
- There are some 1,300 bat species, and they are the second largest order of mammals after rodents.

Reducing the Impact of COVID-19 in all Sectors

Pick for Britain website crashes at launch, after minister calls for 'Land Army' to harvest crops

Fears voiced that new recruits are inexperienced and unable to keep up pace, or may leave to return to their normal jobs

By Gordon Rayner, POLITICAL EDITOR and Hayley Dixon

19 May 2020 · 4:46pm



Agriculture in Britain

- Estimates suggest that 90% of the 75,000 seasonal workers in edible horticulture in the UK are migrants from the EU.



Agriculture in the USA

- Farmers dumped lakes of fresh milk; 3.7M gallons/day in April
- Crop growers plowed acres of vegetables into ground as the nation food supply chain snap and crumble
- A single chicken processor is smashing 750,000 unhatched eggs every week



Unsustainable



Solutions for the Hospitality Industry of the future

- Easy, contact-less check-in
- Improving communication and scheduling of services, eliminating unnecessary interactions using mobile devices
- Offering guests an online platform where they can check-in, order food, even open their door and drapes



The Future Flight Challenge

- Revolutionise air transport
 - Making the UK the market leader
- Support the development of new technologies in the UK
- Focusing on drones, urban air vehicles and hybrid-electric regional aircraft

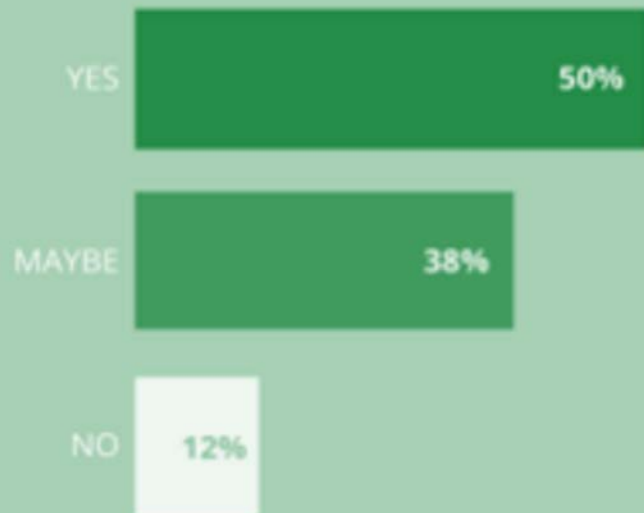


Other Transport Challenges

- 14 weeks to process major timetable changes
- Innovate the sector in order to maintain social distancing

Make it British

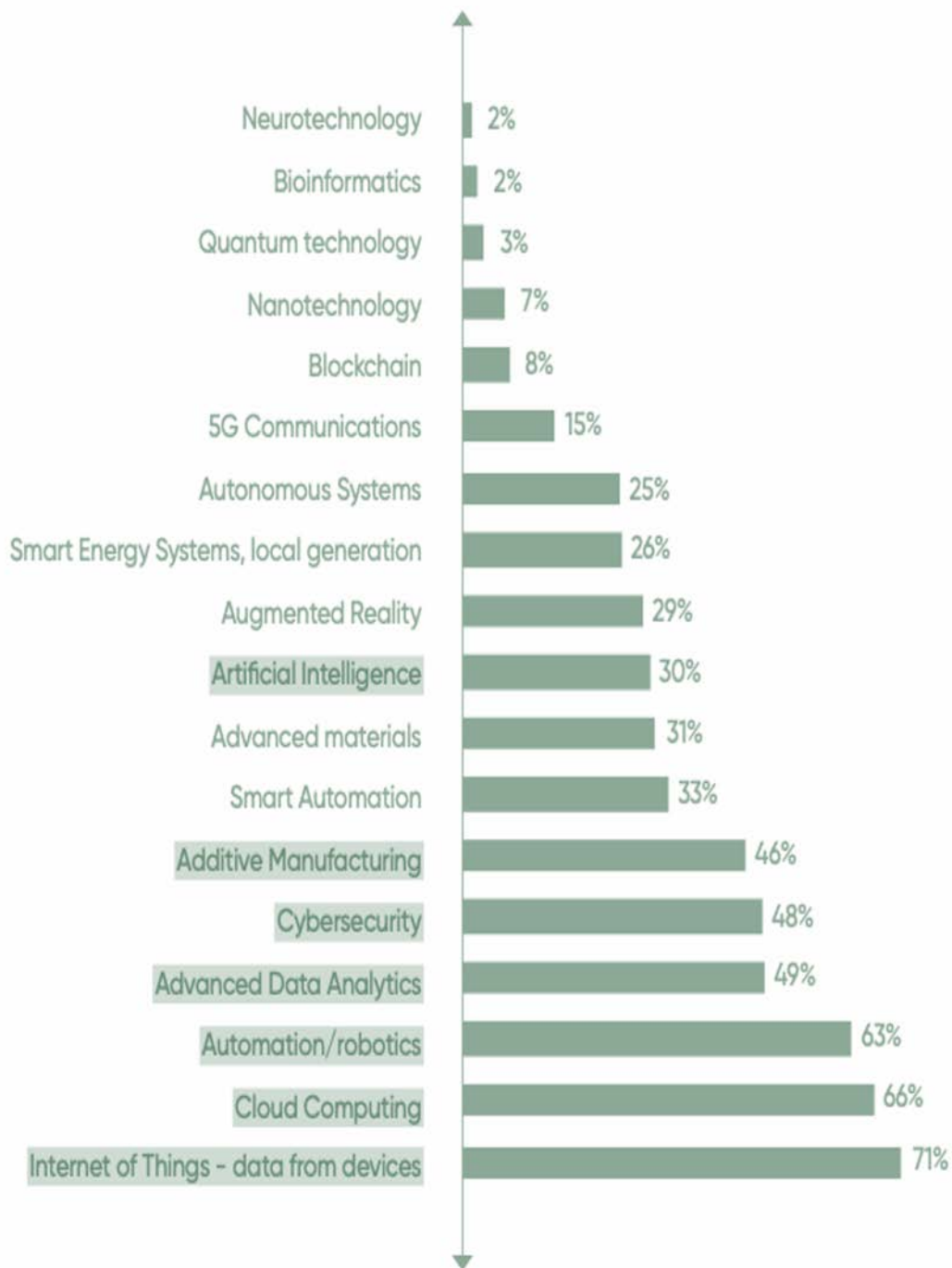
Have you received any new business enquiries linked to the ongoing impact of the Coronavirus?



Make it British
Manufacture Coronavirus Survey

Challenges in the Textile Industry

- Closing of major Chinese textile manufacturing companies due to COVID-19
- Need to innovate the textile sector to reduce high levels of dependency
 - 50% of UK fashion and textile manufacturers reported an increase in new business enquiries due to COVID-19



AI and the Manufacturing Sector

- Demand for AI as per the Annual Manufacturing Report in 2020





Challenges in Other Sectors

- Healthcare
- Construction
- Supply Chain and Distribution



HM Treasury

SPENDING REVIEW 2020

Spending Review 2020

- Security
 - £6.6 Bn: Military, defence modernisation & cyber security, humanitarian disaster
- Health
 - £1.3 Bn: NHIR, Genomic England, general life sciences
 - £559 million to support the modernisation of technology across the health and care system, including the NHS's Artificial Intelligence Lab
 - £ 4.2 Bn – NHS refurbishing their infrastructure
 - £325M – NHS diagnostics equipment
- Infrastructure
 - £19 Bn – transport investment -2021
 - £1.7 Bn- local roads maintenance and upgrades

Spending Review 2020



SPENDING REVIEW 2020

- **Public Services**
 - £1.9 billion for DWP to deliver labour market support, including through the Kickstart Scheme
 - Over £270 million in 2020-21 to support the recovery of the justice system
 - including funding to ensure safety in prisons and courts
 - funding to reduce backlogs in the Crown Court caused by Covid-19
- **Local Businesses**
 - £1.1 billion of one-off funding for councils – to support businesses, as a key part of the local economy
- **Levelling Up**
 - Fund worth £4 billion for England, that will attract up to £0.8 billion for Scotland, Wales and Northern Ireland in the usual way
- **Green Industrial Revolution**
 - £1.1 billion to make homes and buildings net zero-ready.

Funding Opportunities

UFO (Small Flying Objects) call for proposals

Opens: 27/11/2020 Closes: 18/02/2021

Manufacturing Made Smarter Innovation Hub – Smart Factory: Expression of Interest

Opens: 23/11/2020 Closes: 13/01/2020

Smart Farming Innovations for Small-Scale Producers

Opens: 19/10/2020 Closes: 25/02/2021

KTN-iX Challenge: Robotics Platform- Generator Bolt Inspection and Tightening

Opens: 02/11/2020 Closes: 11/01/2021

SBRI Removing air pollutants from homes to safeguard health

Opens: 23/11/2020 Closes: 13/01/2021

African agriculture knowledge transfer partnership (KTP) round 5

Opens: 02/11/2020 Closes: 27/01/2021

ATI Programme strategic batch: Expression of Interest December 2020

Opens: 07/12/2020 Closes: 23/12/2020





For additional Information

- Visit the KTN website
- Attend a KTN event
- Speak to one of our KTN experts
- Be introduced to potential collaborators



Keep informed

Signing for UKRI alerts

- KTN newsletter: <https://www.ktn-uk.co.uk/register>
- KTN events: <https://ktn-uk.co.uk/events>
- UKRI newsletter :
<http://info.innovateuk.org/InnovateUKemailsignupISCF-adaptive>
- UKRI Funding:
<https://apply-for-innovation-funding.service.gov.uk/competition/search>

Connect with Us

<https://ktn-uk.org/robotics-ai/>

https://twitter.com/KTN_RA1

<https://www.linkedin.com/groups/8585234/>

Artificial Intelligence: caroline.chibelushi@ktn-uk.org

Robotics: marie.emerson@ktn-uk.org

The KTN logo is displayed in a bold, lowercase, sans-serif font. The letters 'k', 't', and 'n' are connected at their base. The logo is white and is centered within a large, semi-transparent blue circle that occupies the right side of the slide.

ktn