An Opportunity, a Threat and a Policy implication:

AI and the UK creative industries

John Davies,

Economic Research Fellow

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@johnardavies

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Creative Industries:

Design, Fashion. Film/TV, Computer games, Music, Architecture, Advertising, Publishing

Artificial Intelligence (AI):

Aim of building machines with human-like capabilities. Involves techniques like Machine learning, Deep learning & Data science

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Creative Industries & AI Two related UK strengths

Creative Industries Policy & Evidence Centre
Led by nesta

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The Art in the Artificial
AI and the creative industries

John Davies, Joel Klinger, Juan Mateos-Garcia, Kostas Stathoulopoulos[1]
June 2020

Executive summary

This report aims to quantify levels of activity at the interface of Artificial Intelligence (AI) activity and the creative industries. The UK has a strong position in the creative industries. It has been one of the fastest growing parts of the economy and one of the fastest growing sources of employment in recent years. The UK also has one of the highest shares of the workforce in Europe employed in the creative industries. The importance of the creative industries and AI for the UK's future has been recognised with both areas receiving their own Sector Deals from the government.

Recent breakthroughs in AI could have a large impact on the creative industries. Digitisation has meant that a high proportion of creative content: images, sound and text is now created, distributed and consumed digitally. Large volumes of creative content is recommended to us on platforms like Spotify and YouTube using AI techniques such as machine learning. Digitisation also means that creative content can be directly analysed using machine learning.

The tools of AI have become more effective and also more accessible with extensive open source software available on sites like GitHub. Recent developments such as Generative

- UK has sector deals for AI and Creative Industries

- Creative Industries have been one of the fastest growing sectors of the UK

- UK has one of the largest shares of employment in the creative industries in Europe

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Why AI is important for Creative Industries

1. **AI techniques routinely influence music, text and film we consume** YouTube, Spotify, Amazon & more use machine learning to recommend creative content

2. **AI can be applied across creative industries** Digitalisation means pictures, sound and text can all become data and be analysed using machine learning.

3. **New creative applications of AI** Recent AI breakthroughs: Generative Adversarial Networks (GANs) and Style Transfer already being used creatively.

4. **Scope for AI to spread across creative domains from digital convergence** Use of common digital tools, in particular from games, bringing creative sectors closer together

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AI applications in creative industries are already happening

These have all happened in the last two years

AI generated fashion collections

AI being used to produce albums

Interview
Holly Herndon: the musician who birthed an AI baby
Katie Hawthorne

The experimental composer has built an AI recording system called Spawn to help with her new album – should we worry that the robots are taking over?

AI artwork sold at auction for $432,500

AI being used to produce effects in music videos

Creative AI start-up acquisitions by large tech companies

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It looks like TikTok has acquired Jukedeck, a pioneering music AI UK startup

Mike Butcher @mikebutcher / 9:49 am BST • July 23, 2019   Comm

1. **Issue:** UK has 2 sector deals Creative industries and AI, but no connection between them, despite creative industries being highly digitised

2. **Question:** What is the UK activity in AI relevant for creative industries?
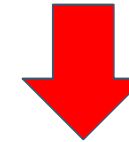
3. **Method:** Machine learning on text from scientific paper abstracts and company data

Question very hard/impossible to answer from official statistics

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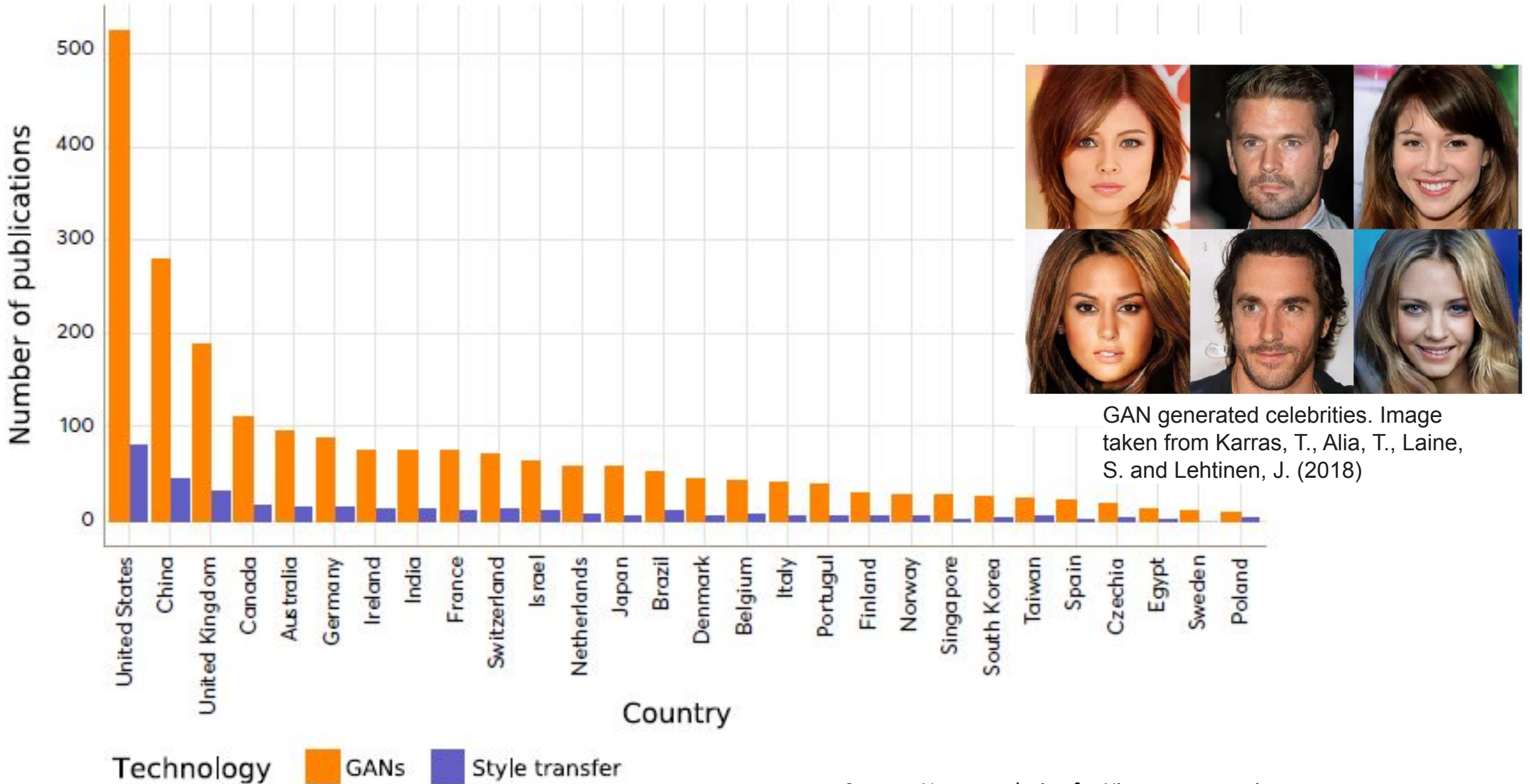1. **UK has the third highest level of AI research publications after the US and China**

2. **If we focus on AI research on image, text and sound data this is still true.**

|	Country	Image based	Sound based	Text based	All three
1	United States	3,319	199	749	4,041
2	China	1,590	59	257	1,805
3	United Kingdom	1,138	116	270	1,437
4	Germany	666	51	139	823
5	Canada	658	47	141	818
6	Australia	573	33	115	684
7	India	474	26	133	594
8	Switzerland	461	33	104	570
9	France	449	33	85	549
10	Ireland	412	32	119	538

Source: Nesta analysis of arXiv computer science

UK a leader in research on AI such as GANs and Style Transfer that are being used creatively

GAN generated celebrities. Image taken from Karras, T., Alia, T., Laine, S. and Lehtinen, J. (2018)

Y-axis: Number of publications (0 to 500)

X-axis (Country): United States, China, United Kingdom, Canada, Australia, Germany, Ireland, India, France, Switzerland, Israel, Netherlands, Japan, Brazil, Denmark, Belgium, Italy, Portugal, Finland, Norway, Singapore, South Korea, Taiwan, Spain, Czechia, Egypt, Sweden, Poland

Technology — ◼ GANs ◼ Style transfer

UK may be a leading AI research centre, but other countries catching up rapidly

% Growth rates in AI research 2019-2015

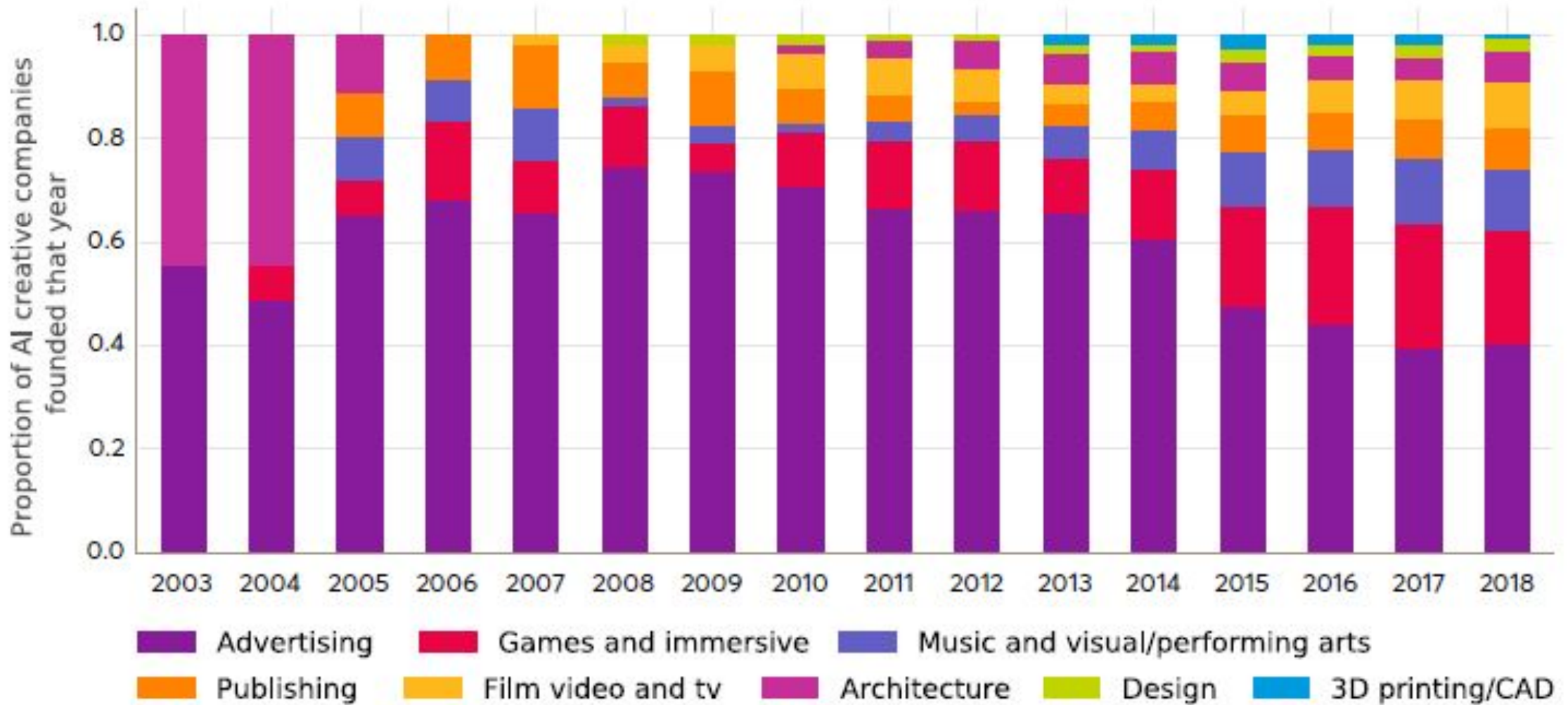Source: Nesta analysis of arXiv computer science

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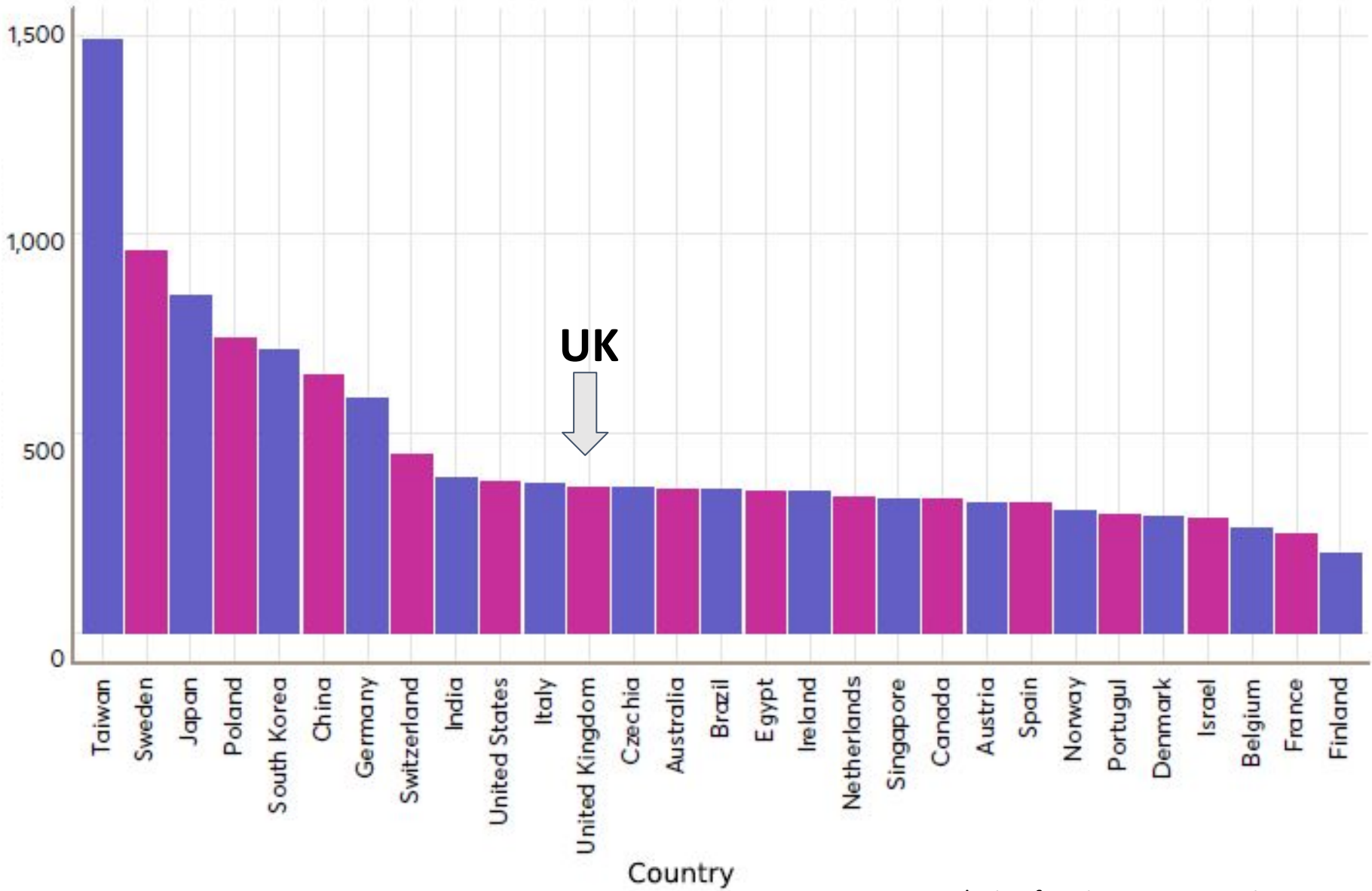
Limited UK funded research involving both AI and Creative industries

		Project categorised as AI	
		False	True
Project categorised as creative	False	36,132	1,346
	True	952	43

We identified only 43 projects involving both AI and Creative industries on the database of research funded projects on Gateway to Research

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Source: Nesta analysis of Gateway to Research data

AI and Creative startups moving away from advertising, into other creative domains

Legend:
- Advertising
- Games and immersive
- Music and visual/performing arts
- Publishing
- Film video and tv
- Architecture
- Design
- 3D printing/CAD

Y-axis: Proportion of AI creative companies founded that year

X-axis: 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018

Source: Nesta analysis of Crunchbase data

Note: absolute levels of start-up activity in the early 00s are much lower than in 2018 so % levels of activity are not comparable

Evidence UK relatively advanced in startup activity involving AI & Creative Industries, but still small scale

Source: Nesta analysis of Crunchbase data.

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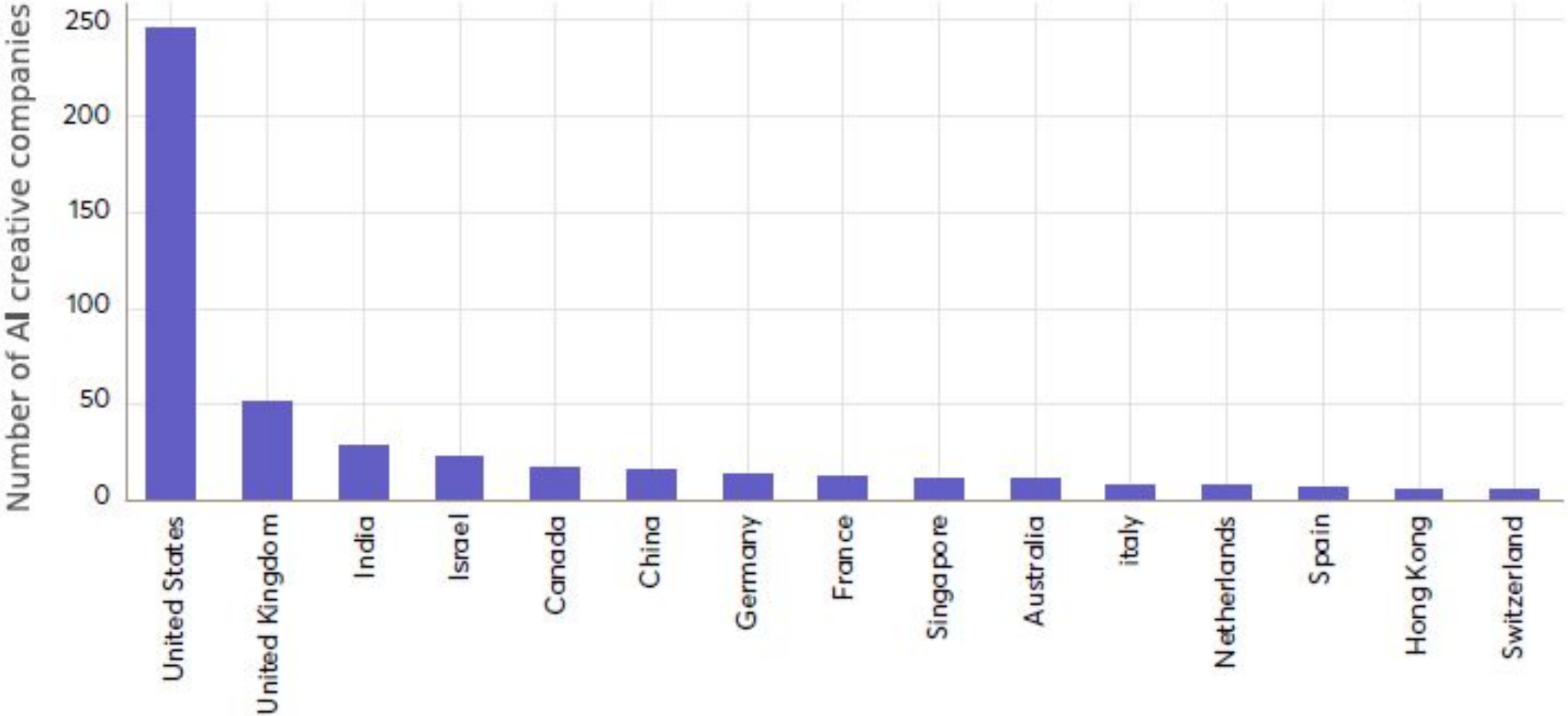
- UK has world leading creative industries
- UK a major global research centre in AI, and for AI research relevant for creative industries
- Several reasons AI likely to impact the sector
- Applications combining AI and creative industries limited in UK, but high relative to rest of world
- Rapid growth in AI globally means UK's position cannot be taken for granted

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Opportunity: UK can combine its complementary strengths of AI & Creative Industries

Threat: AI disrupts Creative Industries, UK does nothing and gets left behind

Policy implication: UK should bridge the gap between academic research in AI and creative practitioners.

Practical actions: More funded University sector collaborations, centre on AI & Creative Industries to unite work in this area

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Thanks for listening

John.Davies@Nesta.org.uk

@johnardavies

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Recent breakthroughs in AI could have a large impact on the creative industries. Digitisation has meant that a high proportion of creative content: images, sound and text is now created, distributed and consumed digitally. Large volumes of creative content is recommended to us on platforms like Spotify and YouTube using AI techniques such as machine learning. Digitisation also means that creative content can be directly analysed using machine learning.

The tools of AI have become more effective and also more accessible with extensive open source software available on sites like GitHub. Recent developments such as Generative Adversarial networks (GANs) and style transfer have enabled new ways to be creative and are influencing artistic activity. The convergence of creative domains driven by wider digital change, such as the use of games technologies in visual effects and architecture, also mean that AI breakthroughs in one area could spread to multiple creative domains.

The UK therefore has an opportunity to exploit the synergies from its strength in both AI and the creative industries. At the same time if AI has a large impact on creative activity, and the UK does not keep pace with developments, then its position in the creative industries could be undermined.

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