

Machine Creativity: Artificial Intelligence Challenges to Copyright Law

The 10th Hong Kong IP Seminar
Intellectual Capital and Intangibles in an Innovation Century

Jyh-An Lee

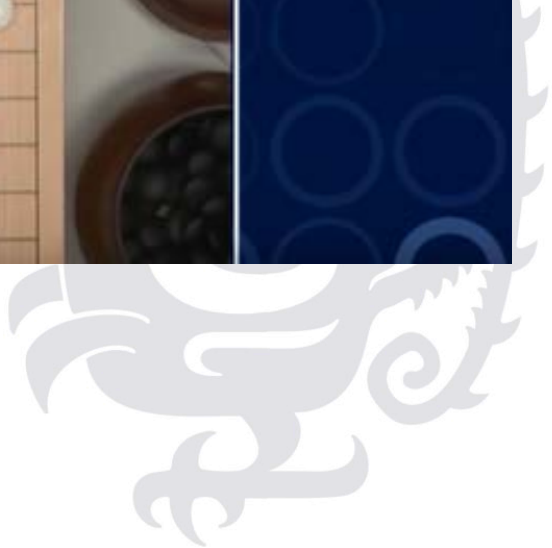
The Chinese University of Hong Kong

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✓ Introduction

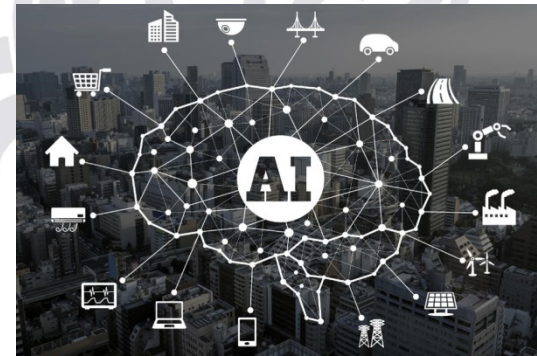
- AI Creation
- Copyright Protection of AI Work
- Policy Consideration
- Conclusion





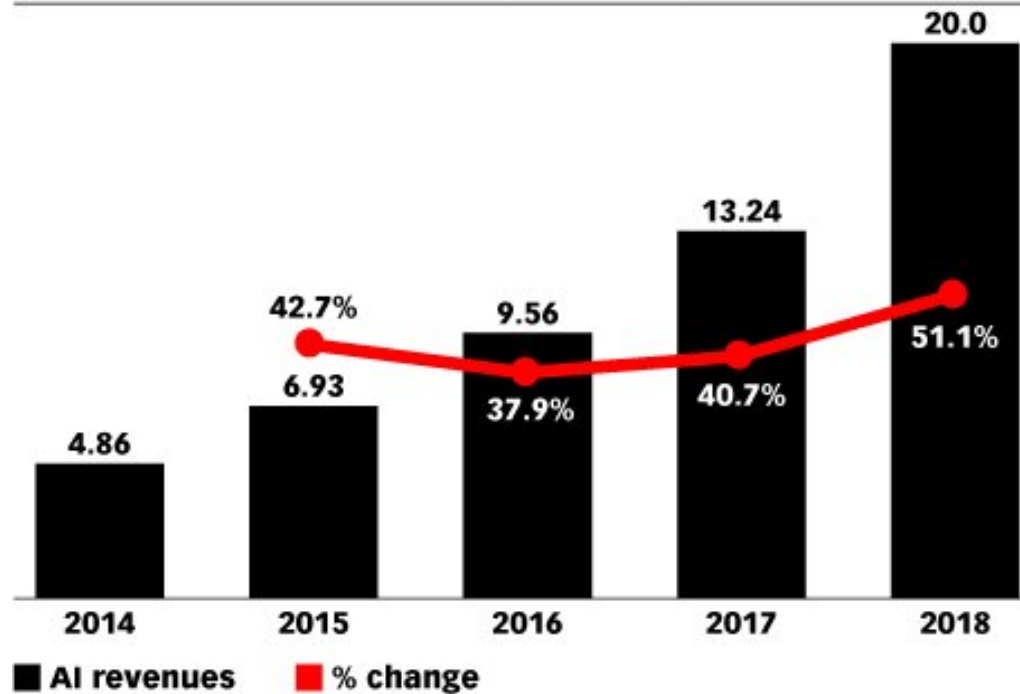
Introduction

- The term artificial intelligence (AI) was coined in 1950s, referring to machines that could perform tasks that required intelligence when performed by humans.
- AI has been increasingly important because of the advancement of digital and computing technologies as well as data science.



Artificial Intelligence (AI) Revenues in China, 2014-2018

billions of Chinese yuan renminbi and % change



Source: Analysys International Enfodesk, "2017 China Artificial Intelligence (AI) Industry Analysis Series: Smart Voice Usage Edition," April 21, 2017

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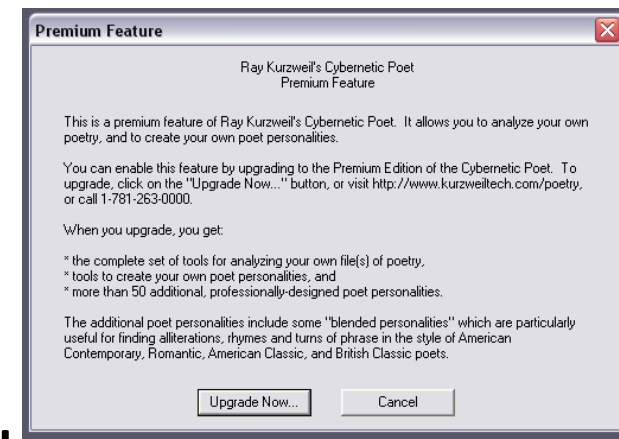


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AI Creation

- Ray Kurzweil's Cybernetic Poet (RKCP): a computer poet designed by the American futurist Ray Kurzweil.
- RKCP can read and analyze poems by an author and produce poetry with similar language style, patterns, and organization.



AI Creation

- Google's AI Projects

there is no one else in the world .
there is no one else in sight .
they were the only ones who mattered .
they were the only ones left .
he had to be with me .
she had to be with him .
i had to do this .
i wanted to kill him .
i started to cry .
i turned to him .





小冰師從於1920年以來
519位中國現代詩人，經
過對幾千首詩10000次的
學習，獲得了現代詩的
創造力

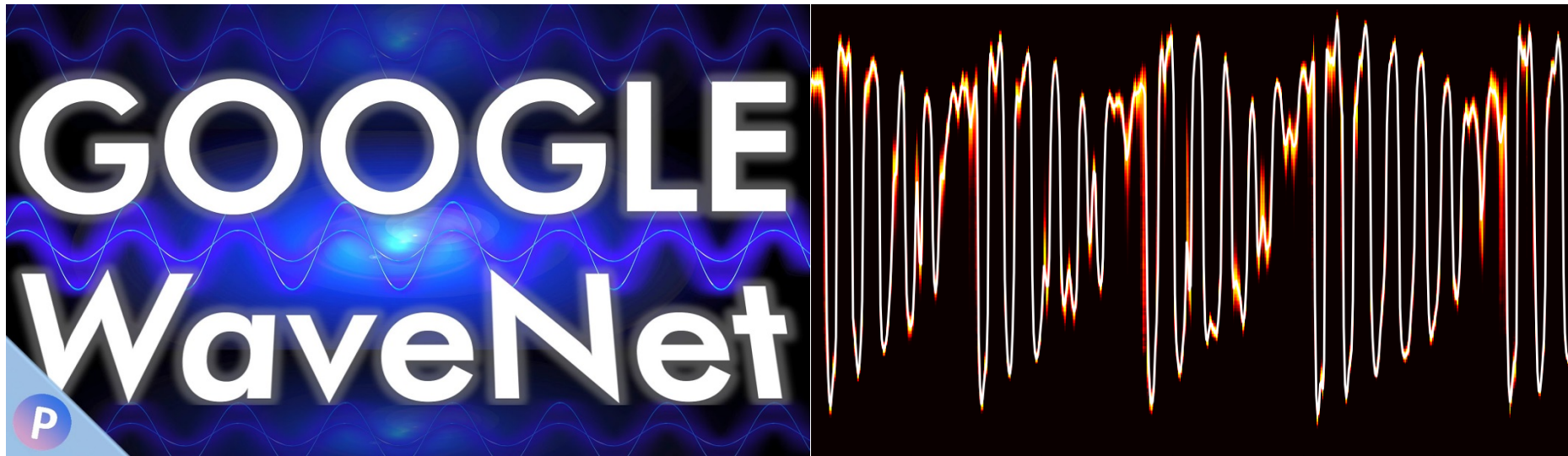
阳光失了玻璃窗

人类史上首部
人工智能灵思诗集

跟随“少女诗人”“萌妹子”微软小冰
走 | 进 | 诗 | 的 | 唯 | 美 | 世 | 界

AI Creation

- Google's WaveNet project produces piano compositions when given a set of classic music to analyze.



The Next Rembrandt

After studying the brushstrokes, coloration, motifs, patterns, and other aesthetic elements in Rembrandt's works, an intelligence machine in Netherland produced a portrait





Works Facilitated by Computers

- **Computer-assisted work**
 - Human beings use some tools to facilitate or improve their works
 - Just like pen-assisted, camera-assisted work
- **Computer-generated work**
 - After the programming activities, the role played by human in the creation of the work is negligible
 - Works are created in total absence of any human intervention at the time of the creation of the work.



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AI Work

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Originality



- Independent Creation
 - The work was not copied from elsewhere
- Minimum Degree of Human Creativity
 - Exercise of the author's skill and/or judgment
 - Civil law jurisdictions: reflection of personality





Engineering Test to Determine AI

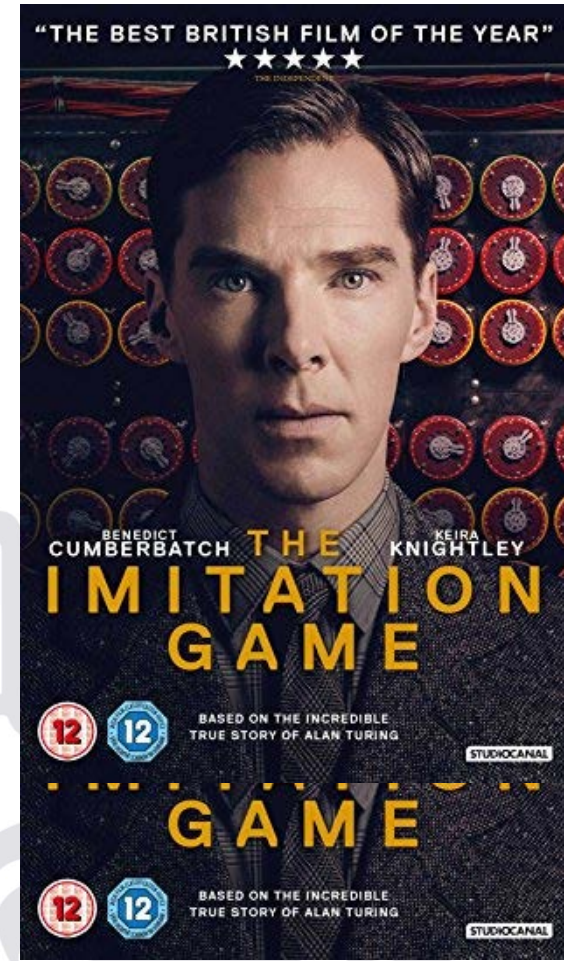


WHAT IS A.I.?



Turing Test

- Developed by Alan Turing, an English computer scientist, mathematician, logician, cryptanalyst, philosopher, and theoretical biologist
- “Computing Machinery and Intelligence”
 - *Can Machines Think?*
- Turing Test: **A machine is intelligent if it is able to think**



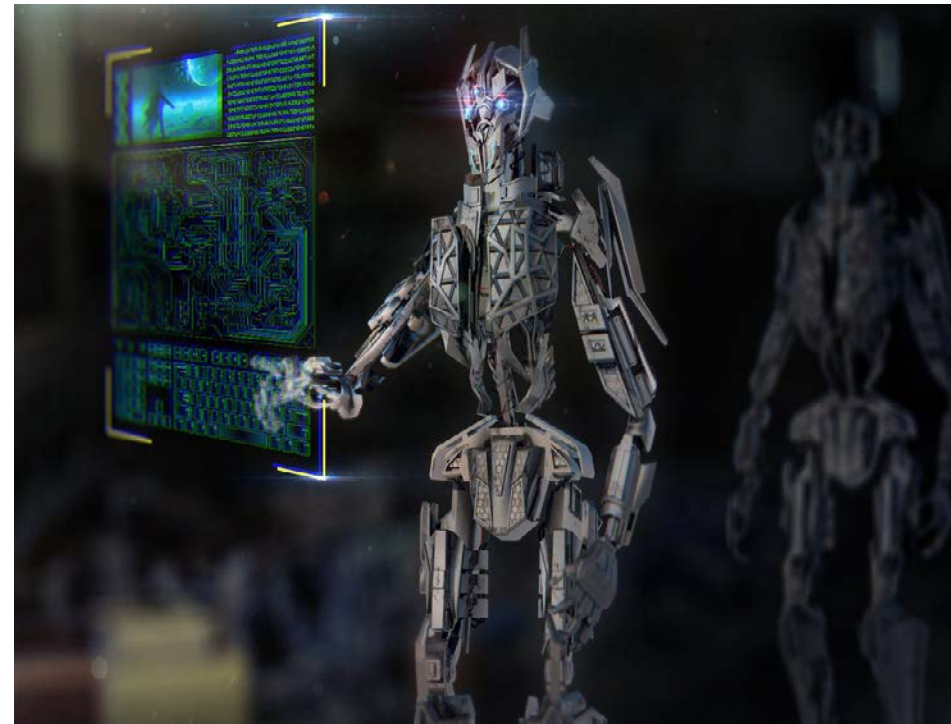
Lovelace Test



- Lady Ada Lovelace (1843), an English mathematician considered the world's first computer programmer
 - A machine could not have human-like intelligence as long as it only did what humans intentionally programmed it to do.
 - A machine must be able to create **original** ideas if it is to be considered “intelligent”.
- Lovelace Test (2010)
 - A machine can pass this test if it can produce an outcome that its designer cannot explain based on their original code

Copyright Protection

- Should copyright protect AI work when AI makes its own creative decisions independent from human input?
- Is AI work original?



No Protection

- United States Copyright Office, *Compendium of U.S. Copyright Office Practices* (3rd edn, 2017)
 - “To qualify as a work of ‘authorship’ a work **must be created by a human being**...Works that do not satisfy this requirement are not copyrightable.”
 - “the Office will **not** register works **produced by a machine**...that operates...automatically without any creative input or intervention from a human author.”



UNITED STATES COPYRIGHT OFFICE

No Production

- United States Copyright Office, *Compendium of U.S. Copyright Office Practices* (3rd edn, 2017) (cont'd)
 - examples for uncopyrightable works
 - Medical imaging produced by x-rays, ultrasounds, magnetic resonance imaging, or other diagnostic equipment”
 - A claim based on a mechanical weaving process that randomly produces irregular shapes in the fabric without any discernible pattern.”



UNITED STATES COPYRIGHT OFFICE

No Protection



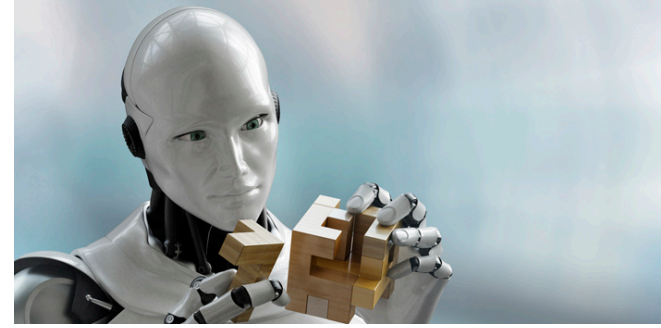
- Preamble to the Copyright Term Directive 93/98:
 - Original work is the “author’s own intellectual creation reflecting his personality”
- *Painer v Standard Verlags, GmbH* (C-145/10) EU:C” 2011: 798; [2012] E.C.D.R. 6.
 - A copyright work reflect the author’s “personality and express his free and creative choices in the production of that photograph”

Protection

- UK: Copyright, Designs and Patent Act 1988 (CPDA)
 - s.178: a **computer-generated work**
 - “generated by computer in circumstances such that there is **no human author** of the work”
 - s.9(3): “In the case of a literary, dramatic, musical or artistic work which is computer-generated, the **author** shall be taken to be the person by whom the **arrangements necessary for** the creation of the work are undertaken.”



Protection



- UK: Copyright, Designs and Patent Act 1988 (CPDA) (cont'd)
 - s.12(3): period of 50 years from the end of the calendar year in which the work was made
 - s.79 & s.81: exemption from moral rights
 - William Cornish et al:
 - Neighbouring right approach
 - conflicting with EU’s “intellectual creation” standard (2013)



Protection

- Issues regarding copyright ownership: who is “the person by whom the **arrangements necessary for** the creation of the work are undertaken”?
 - AI Programmers? Users?
 - *Nova Productions v Mazooma Games*
[2007] EWCA Civ 219; [2007] Bus. L.R. 1032
 - Computer-generated work: Graphics and frames shown on the screen when playing a computer game



Protection

- *Nova Productions v Mazooma Games* [2007] EWCA Civ 219; [2007] Bus. L.R. 1032
 - Jacob LJ
 - The programmer “is the person by whom the arrangements necessary for the creation of the works were undertaken and therefore is deemed to be the author by virtue of s.9(3)”
 - The player’s “input is not artistic in nature and he has contributed no skill or labour of an artistic kind. Nor has he undertaken any arrangements necessary for the creation of the frame images. All he has done is to play the game.”
 - Standard: **who “contributed skill or labour of an artistic kind”?**

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• Incentive

100 STARTUPS USING ARTIFICIAL INTELLIGENCE TO TRANSFORM INDUSTRIES

CONVERSATIONAL AI/ BOTS



VISION



AUTO



ROBOTICS



CYBERSECURITY



BUSINESS INTELLIGENCE & ANALYTICS



CORE AI



AD, SALES, CRM



HEALTHCARE



OTHER



TEXT ANALYSIS/ GENERATION



IOT/IIT



COMMERCE



FINTECH & INSURANCE



THE INNOVATION SUMMIT



The current AI wave is poised to finally break through

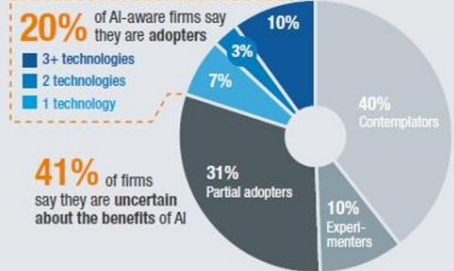
Investment in AI is growing at a high rate, but adoption in 2017 remains low

In 2016, companies invested **\$26B to \$39B** in artificial intelligence

TECH GIANTS **\$20B to \$30B**

STARTUPS **\$6B to \$9B**

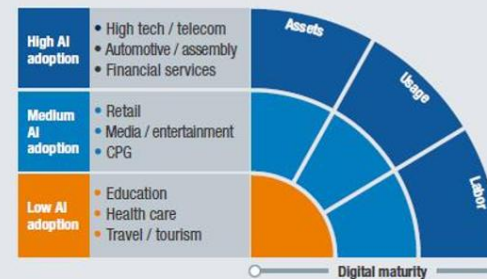
3x External investment growth since 2013



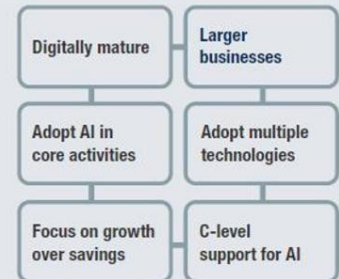
41% of firms say they are uncertain about the benefits of AI

How companies are adopting AI

AI adoption is greatest in sectors that are already strong digital adopters

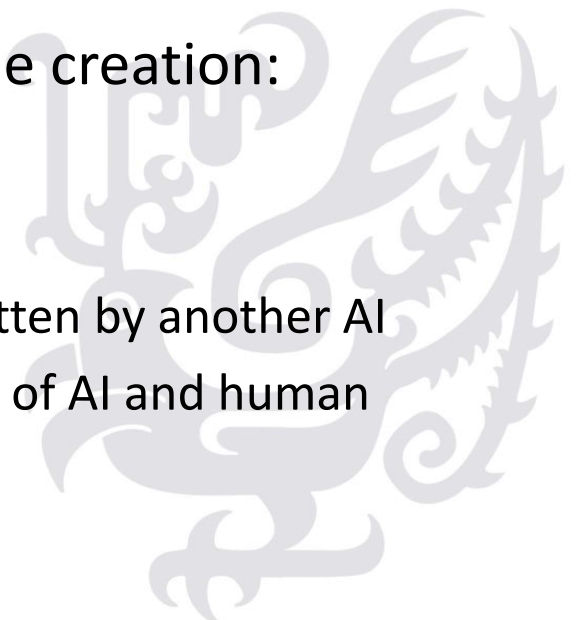


Six characteristics of early AI adopters





- Incentive
- Authorship
 - Personal nature of the originality
 - Rethinking “computer-generated content”
 - Still consider the human nature of the creation: necessary arrangement
 - May be much more complicated
 - A work created by an AI, which was written by another AI
 - A work resulting from the collaboration of AI and human beings



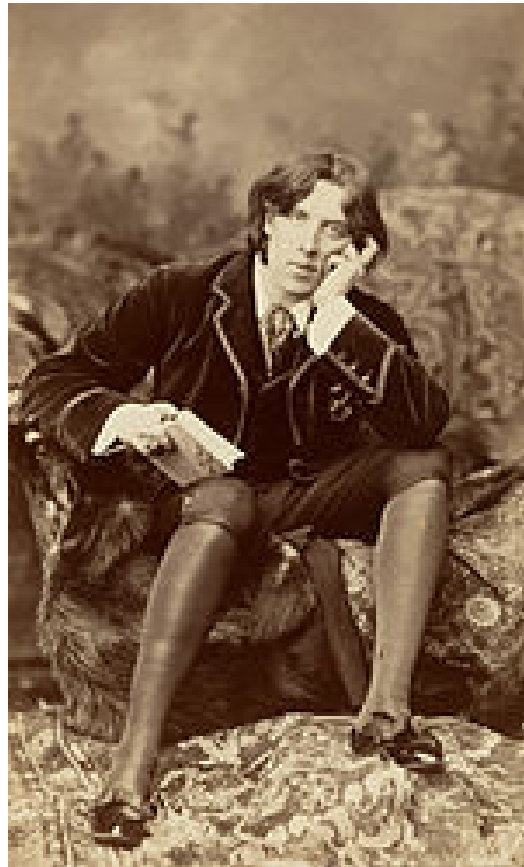
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- Incentive
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- **Use of Technology in Creation**



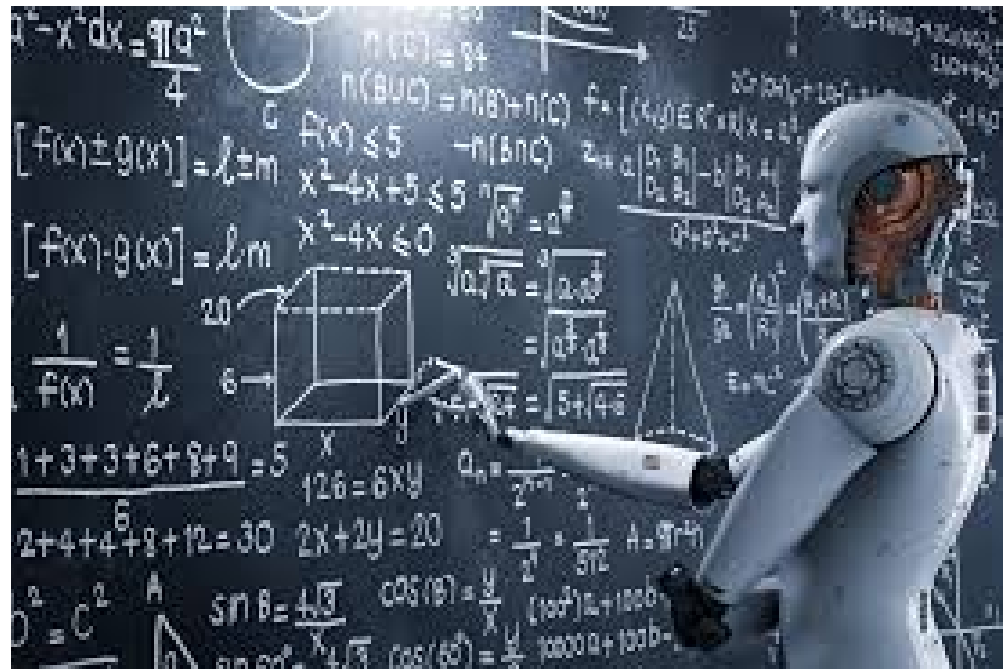
Use of Technology in Creation



- *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53 (1884)
 - Defendant Burrow-Giles argued that a photograph is not a writing nor “the production of an author”
 - Supreme Court: there was “original mental conception...[in] posing...Oscar Wilde in front of the camera, selecting and arranging the costume, draperies...arranging the subject so as to present graceful outlines, arranging and disposing the light and shade...”



- *Nova Productions v Mazooma Games* [2007] EWCA Civ 219; [2007] Bus. L.R. 1032
 - Copyright owned by programmers but not game players?
 - Users/licensees of AI to create



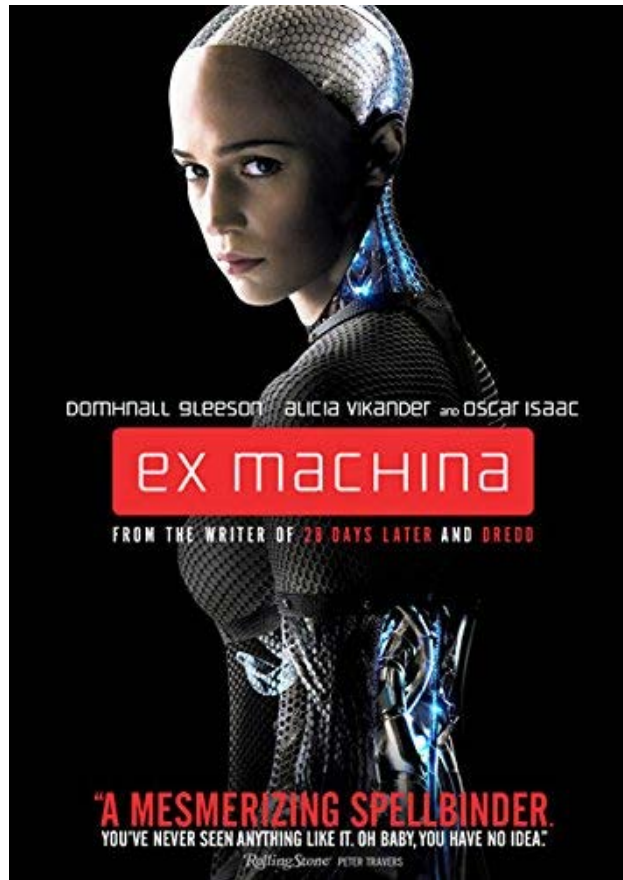
- Incentive
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 - Personal nature of the originality
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- Use of Technology in Creation
- **Other ways to encourage AI development?**



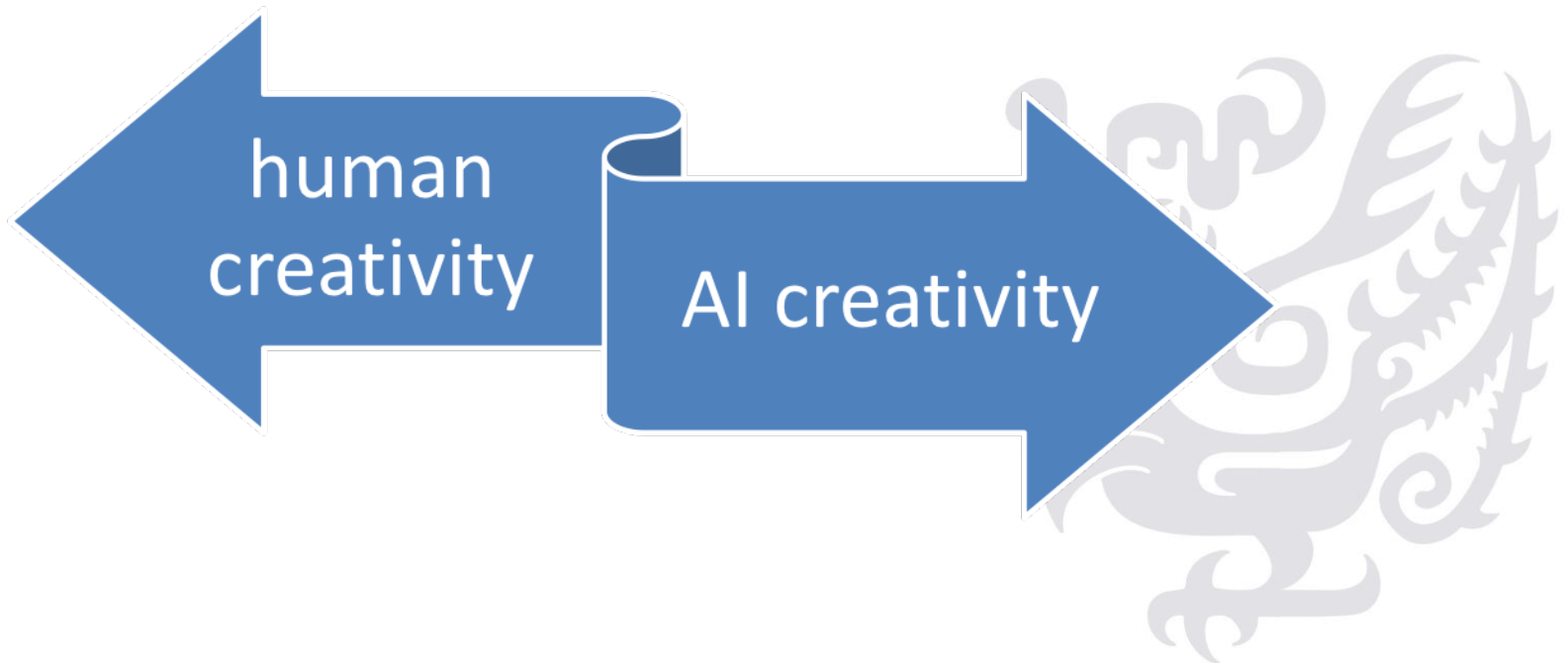
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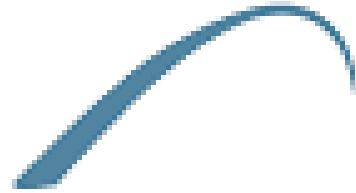






- The degree of human control and creative decision made by human
- The degree of AI's independence in creative activities
- Grey area in between





THANK YOU
FOR
YOUR ATTENTION

