Artificial Intelligence

Navigating the Legal, Regulatory and Ethical requirements

11 December 2019

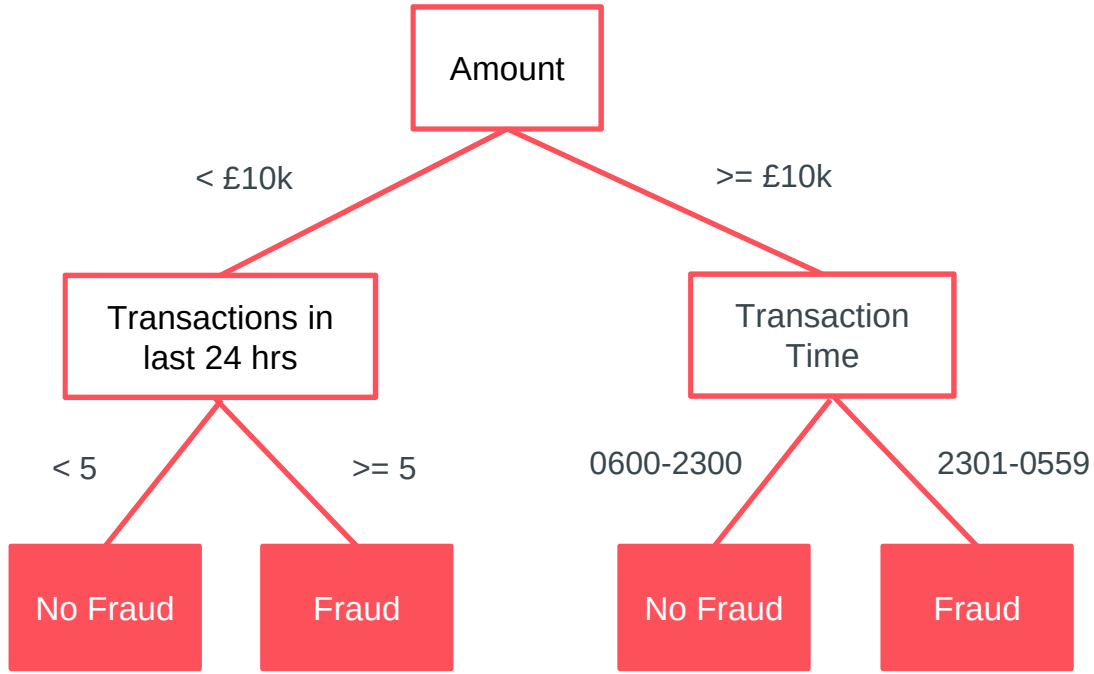
Introduction

Traditional (non-AI) computer programming

Traditional programming involves computers making decisions based on pre-programmed rules

Example – fraud detection

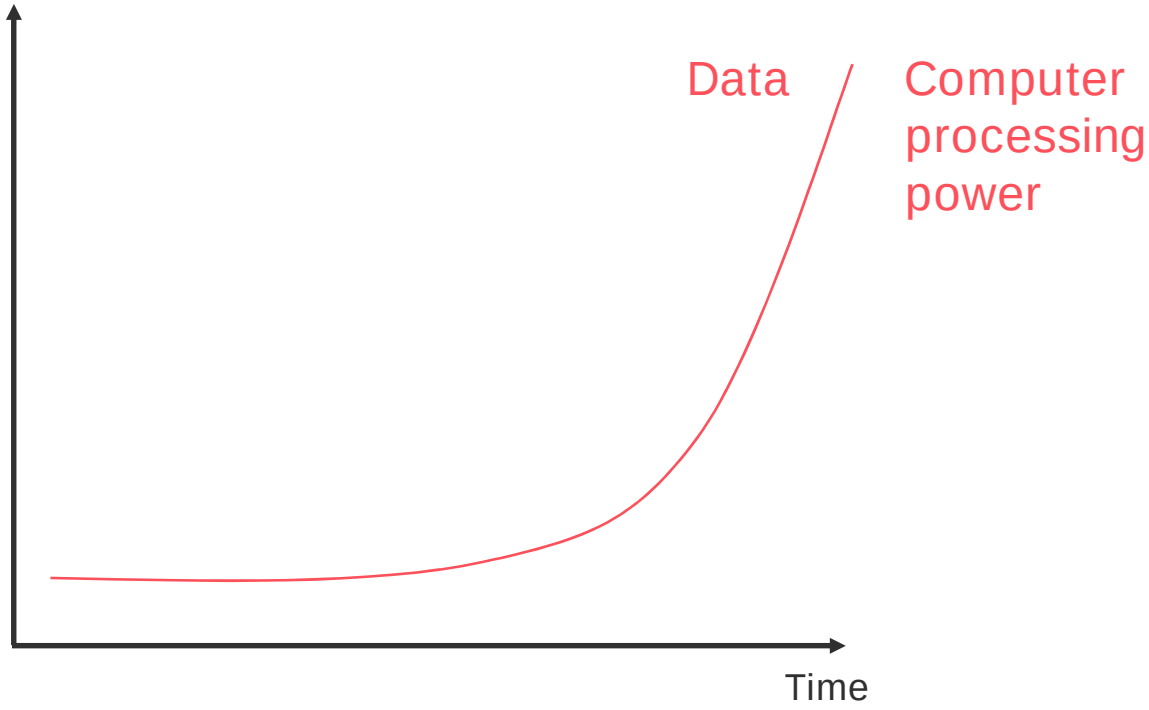
- A computer can analyse customer transactions and, using a set of pre-programmed rules, decide whether or not the transaction is fraudulent
- Humans need to decide on the features the computer should review and the weight of each of those features



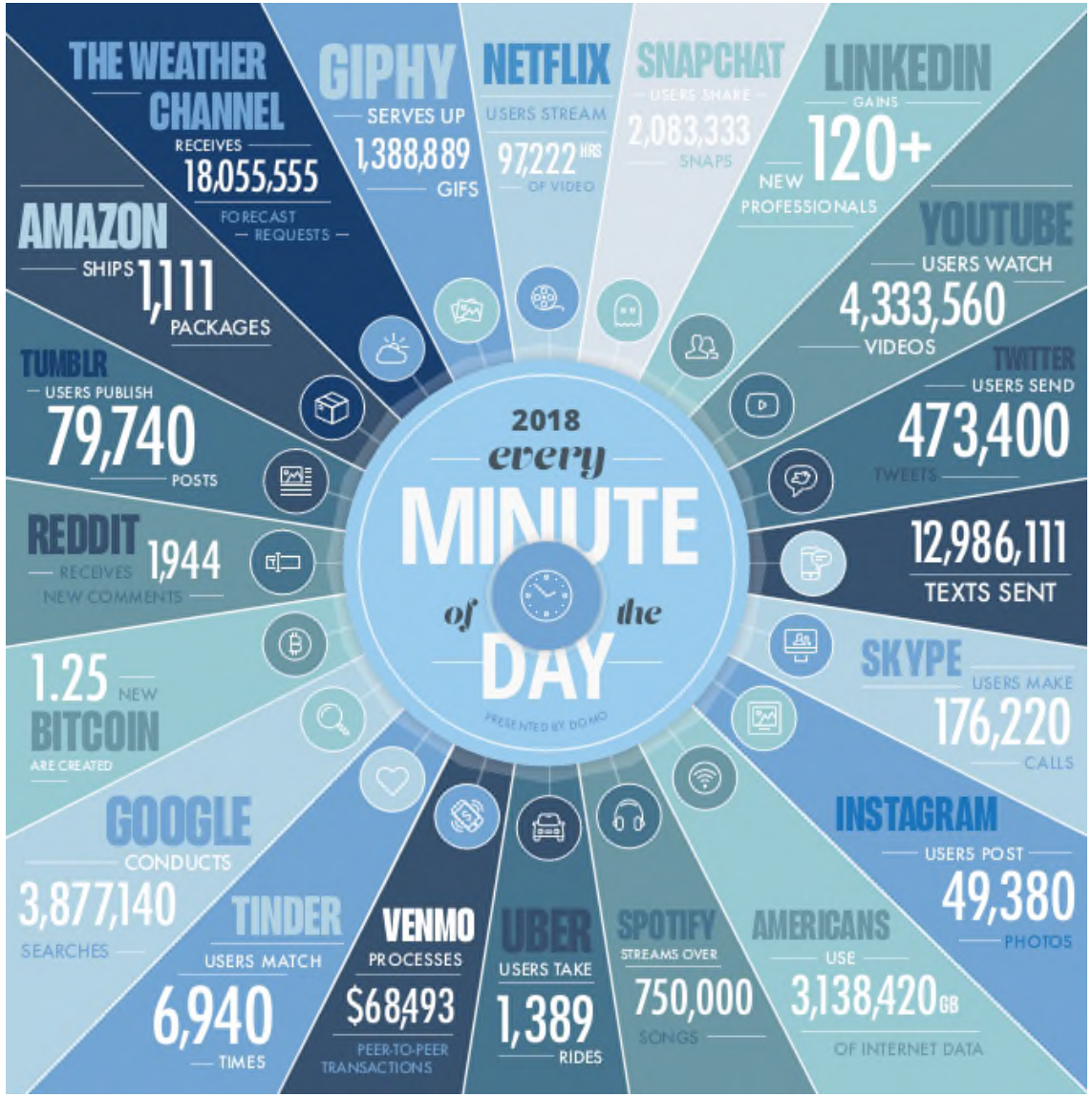
The rise of AI

1. Availability of “big data” (in digital form)

2. Ability of computers to process big data

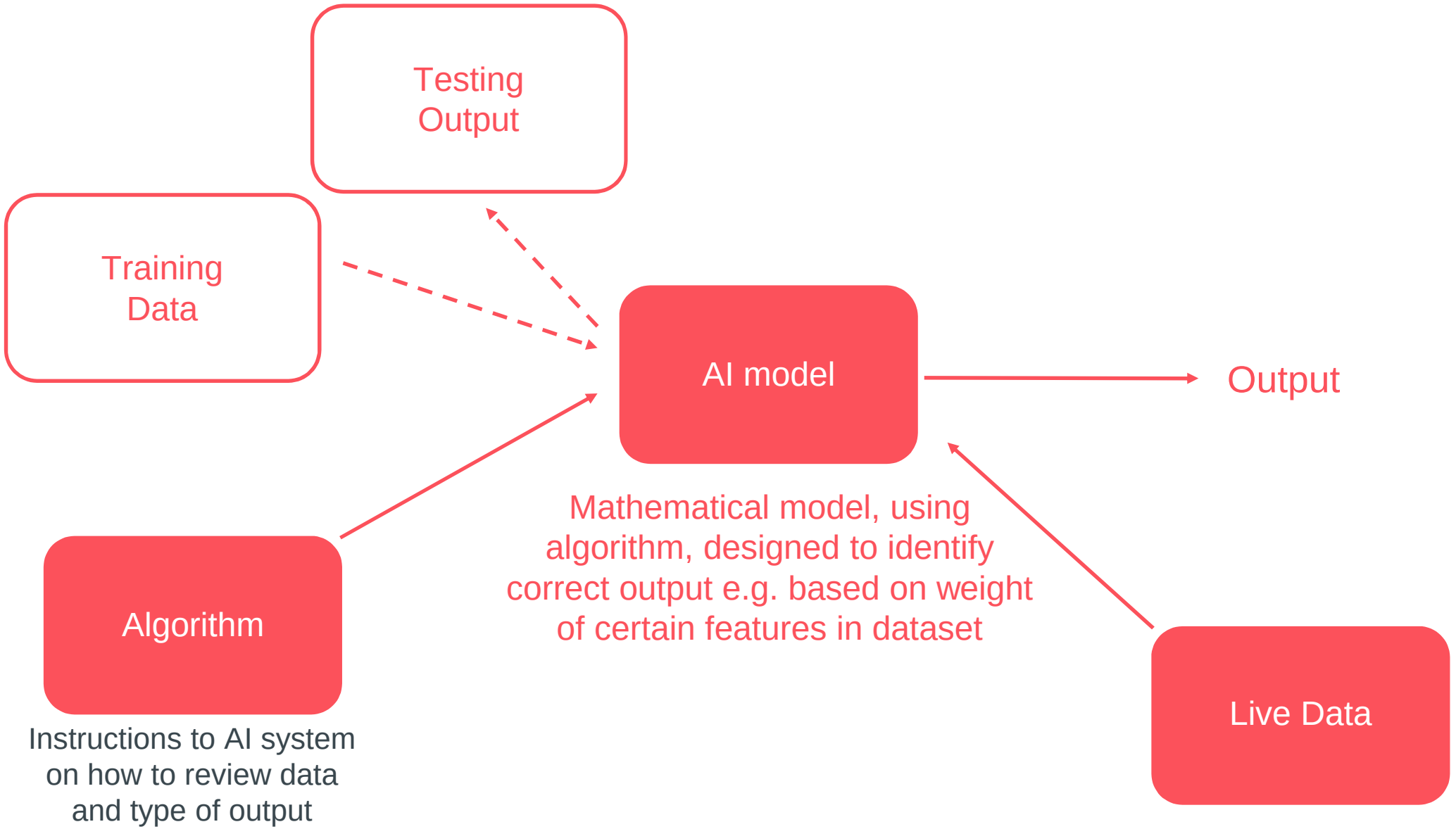


How big is “big data”?

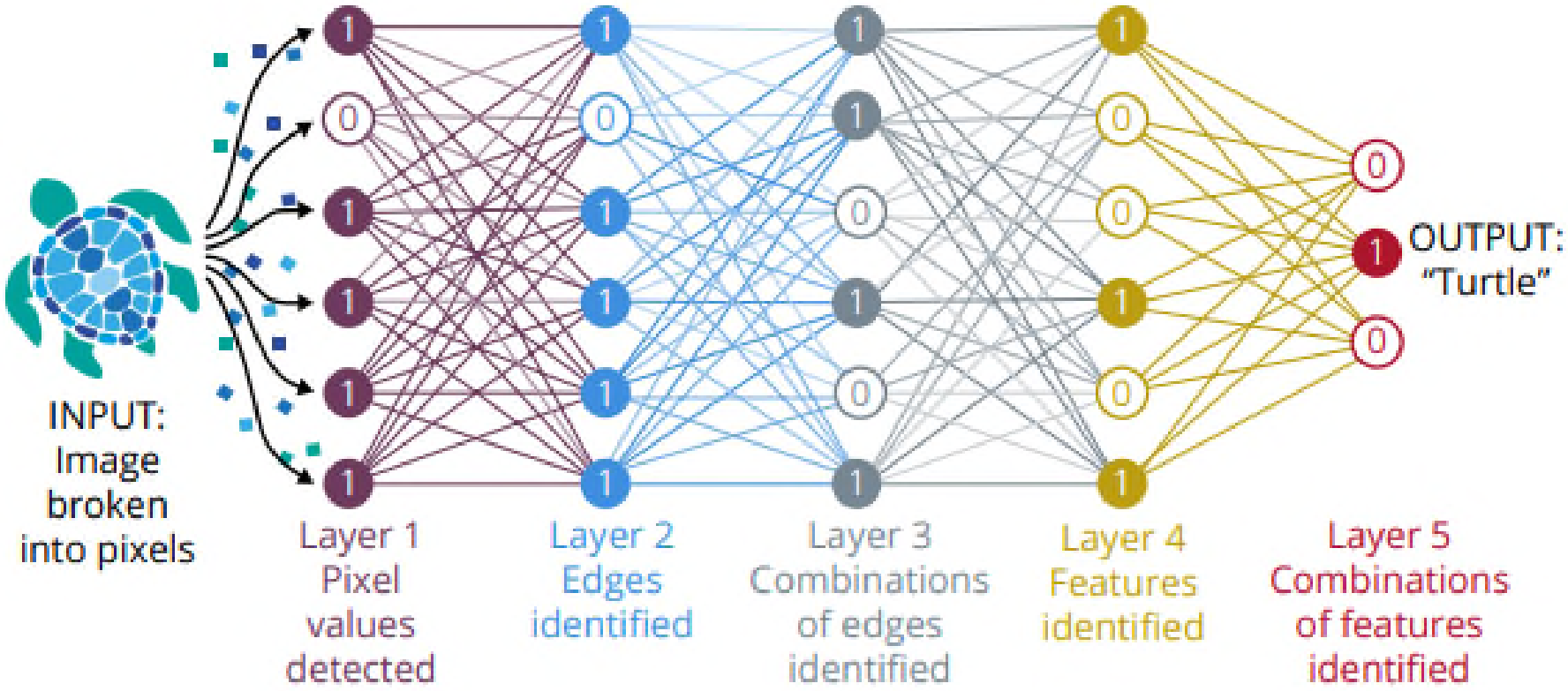


How many boxes would we fill if we printed out all of our data?

How does AI work?



The model as a “black box”



Source: ‘New Theory cracks open the black box of deep neural networks’, Wired (10 August 2017): https://www. wired.com/story/new-theory-deep-learning/

Session 1: Ethical / responsible AI

Structure

- Introduction to ethical / responsible AI

  Simon Greenman, Founder of Best Practice AI and Member of World Economic Forum Global AI Council

- Putting ethical AI into practice: *Microsoft*

  Vijayalaxmi Aithani, Head of Enterprise Legal at Microsoft Limited

- Panel discussion

  including Alexander Brown, Head of TMT Sector, Simmons & Simmons

- How we can assist clients to implement ethical / responsible AI

Best Practice AI

The ethics and risks of AI

Simon Greenman

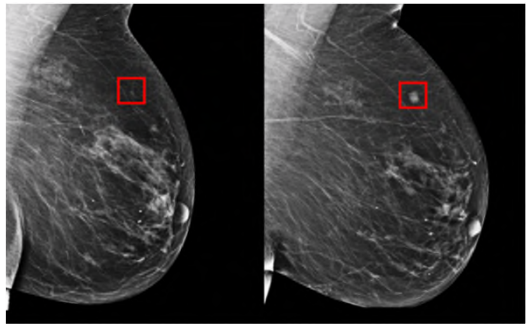
Partner, Best Practice AI

simon@bestpractice.ai

AI will be woven into the fabric of society with the potential to transform lives, companies and government

Improving crop yields in India with predictive plant disease diagnosis

Predicting occurrences of diseases earlier and more accurately



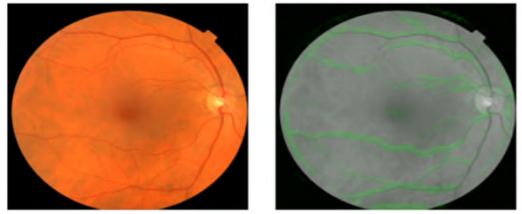
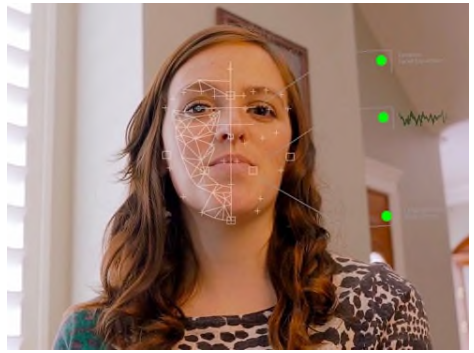


Image of retina

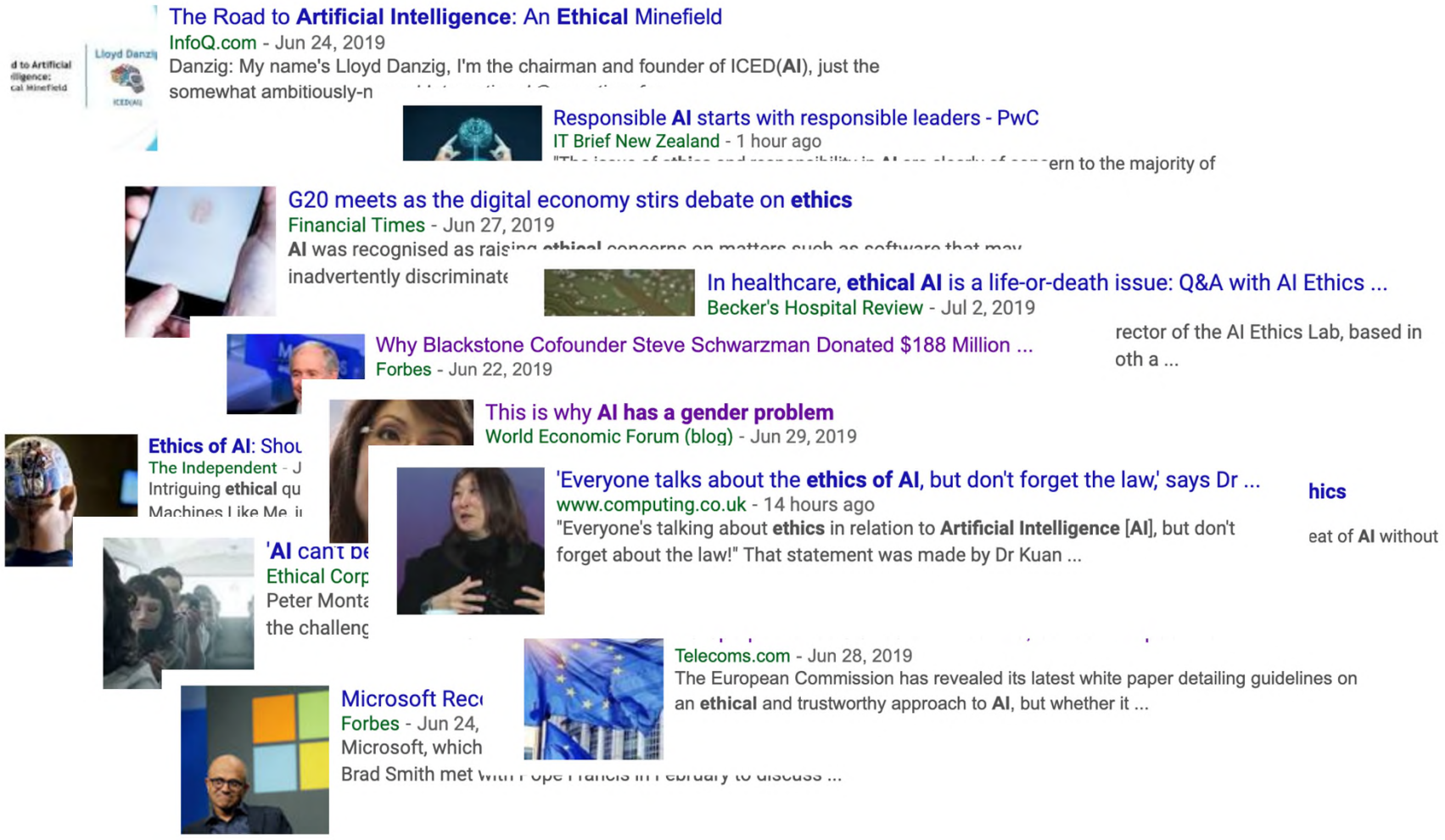
Blood pressure predictions focus on blood vessels

Improving corporate performance - HR candidate and supply chain forecasting



https://www.geek.com/science/google-ai-looks-deep-into-your-eyes-to-predict-heart-disease-1731573/
https://www.thebetterindia.com/174945/indian-railways-watch-movie-free-wifi-mumbai-local/
https://techcrunch.com/2019/06/26/mit-ai-tool-can-predict-breast-cancer-up-to-5-years-early-works-equally-well-for-white-and-black-patients/
https://www.economist.com/business/2017/04/12/how-germanys-otto-uses-artificial-intelligence
https://www.insider.com/unilever-artificial-intelligence-hiring-process-2017-6

However much of the AI narrative is dominated by the topic of ethics and risks



What is AI ethics?

AI ethics is a set of values, principles, and techniques that employ widely accepted standards of right and wrong to guide moral conduct in the development and use of AI technologies

The field of AI ethics has largely emerged as a response to the range of individual and societal harms that AI systems may cause

The main issues have ethical, legal, reputational and societal risks:

- Bias and discrimination
- Denial of individual autonomy, recourse and rights
- Non-transparent, unexplainable or unjustifiable outcomes
- Invasion of privacy
- Isolation and disintegration
- Unreliable, unsafe or poor-quality outcomes

https://www.turing.ac.uk/sites/default/files/2019-06/understanding_artificial_intelligence_ethics_and_safety.pdf

Ethics of AI – the risk of bias and discrimination

Gender classification systems are often biased as they are not trained on representative sample datasets of gender & ethnicity

Gender was misidentified in up to 1% of lighter-skinned males

Gender was misidentified in up to 7% of lighter-skinned females

Gender was misidentified in 35% of darker skinned females

https://www.nytimes.com/2018/02/09/technology/facial-recognition-race-artificial-intelligence.html
https://www.ted.com/talks/joy_buolamwini_how_i_m_fighting_bias_in_algorithms
https://www.theatlantic.com/health/archive/2018/08/machine-learning-dermatology-skin-color/567619/

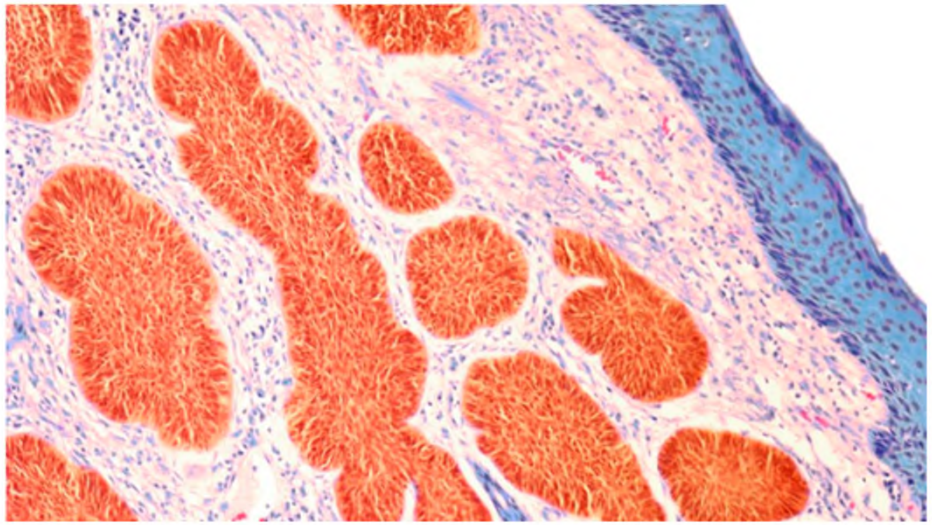
These biases could have serious negative consequences especially false negatives in the healthcare field

The Atlantic

AI-Driven Dermatology Could Leave Dark-Skinned Patients Behind

Machine learning has the potential to save thousands of people from skin cancer each year—while putting others at greater risk.

ANGELA LASHBROOK AUGUST 16, 2018



STEVE GSCHMEISSNER / GETTY

LaToya Smith was 29 years old when she died from skin cancer. The young doctor had gotten her degree in podiatry from Rosalind Franklin University, in Chicago, just four

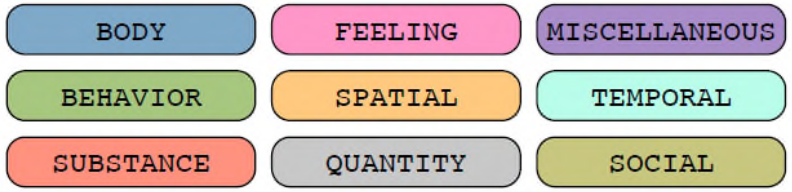
https://www.nytimes.com/2018/02/09/technology/facial-recognition-race-artificial-intelligence.html
https://www.ted.com/talks/joy_buolamwini_how_i_m_fighting_bias_in_algorithms
https://www.theatlantic.com/health/archive/2018/08/machine-learning-dermatology-skin-color/567619/

AI shines a spotlight and often amplifies our human biases

What did the algorithm learn after reading 3.5 million books and 11 billion words?

Top 11 positive and negative adjectives associated with females and males

Female		Male	
Positive	Negative	Positive	Negative
beautiful	battered	just	unsuitable
lovely	untreated	sound	unreliable
chaste	barren	righteous	lawless
gorgeous	shrewish	rational	inseparable
fertile	sheltered	peaceable	brutish
beauteous	heartbroken	prodigious	idle
sexy	unmarried	brave	unarmed
classy	undernourished	paramount	wounded
exquisite	underweight	reliable	bigoted
vivacious	uncomplaining	sinless	unjust
vibrant	nagging	honorable	brutal



What we learned from this word analysis:

- Words used for women refer much more to their **appearances** than for men
- Negative words associated with **body and appearance** appear five times as often for females
- Male words are most frequently described using adjectives that refer to their **behaviour** and **personal qualities**

There is a systemic, systematic, racist, sexist, gendered, class-oriented and other axes of discrimination-bias embedded in most data collected by humans

https://www.futurity.org/adjectives-gender-descriptions-books-2143682-2/

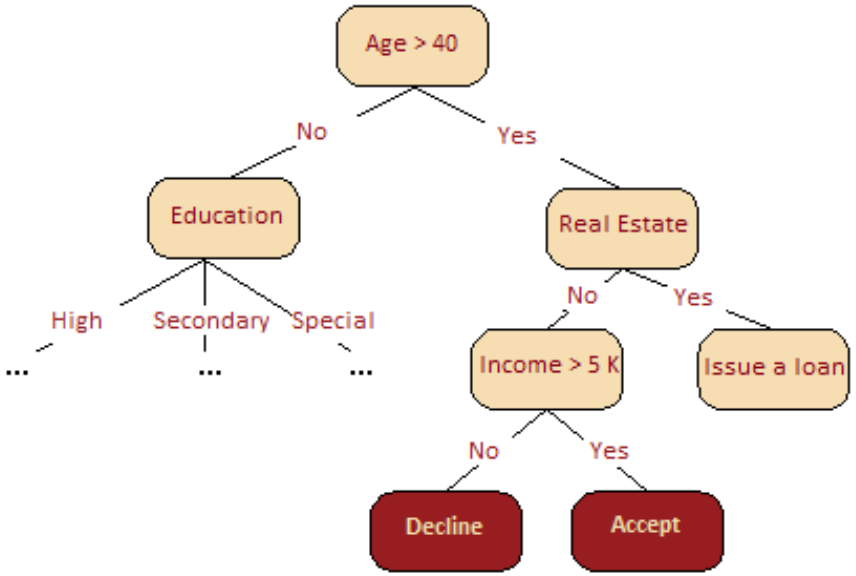
We need to understand how are algorithms built, validated and examined for bias…

https://www.8andabove.com/wp-content/uploads/wpjobboard/resume/643/video/College_Students_2.mp4
https://www.8andabove.com/wp-content/themes/wall-street-child/videos/ZGroup_Carol_Video_Rework_VER4.mp4

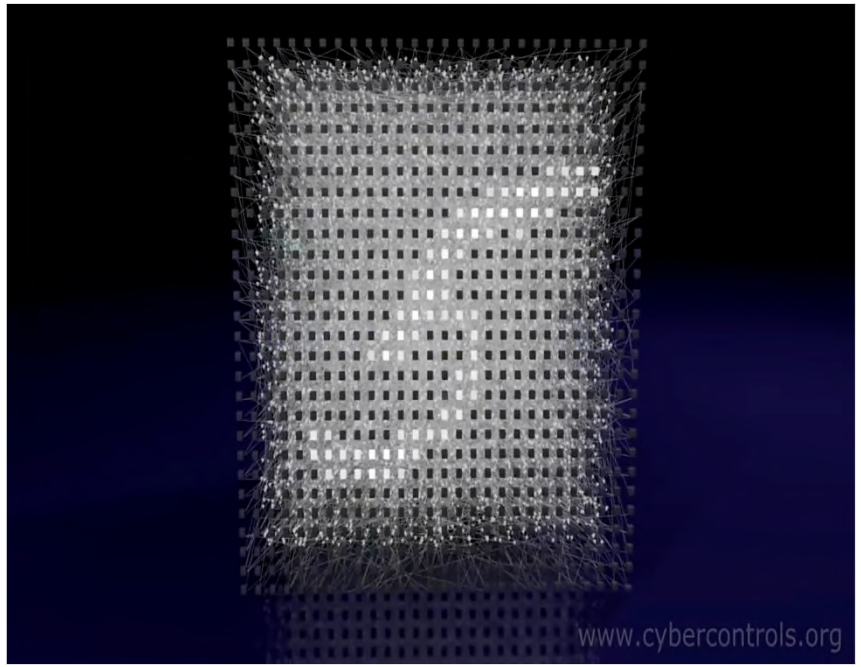
Companies need Explainable AI (XAI)

There is often a tradeoff between interpretability and accuracy of explainability

Inferable models, such as decision trees, provide non-technical explanations (e.g. a loan decision)

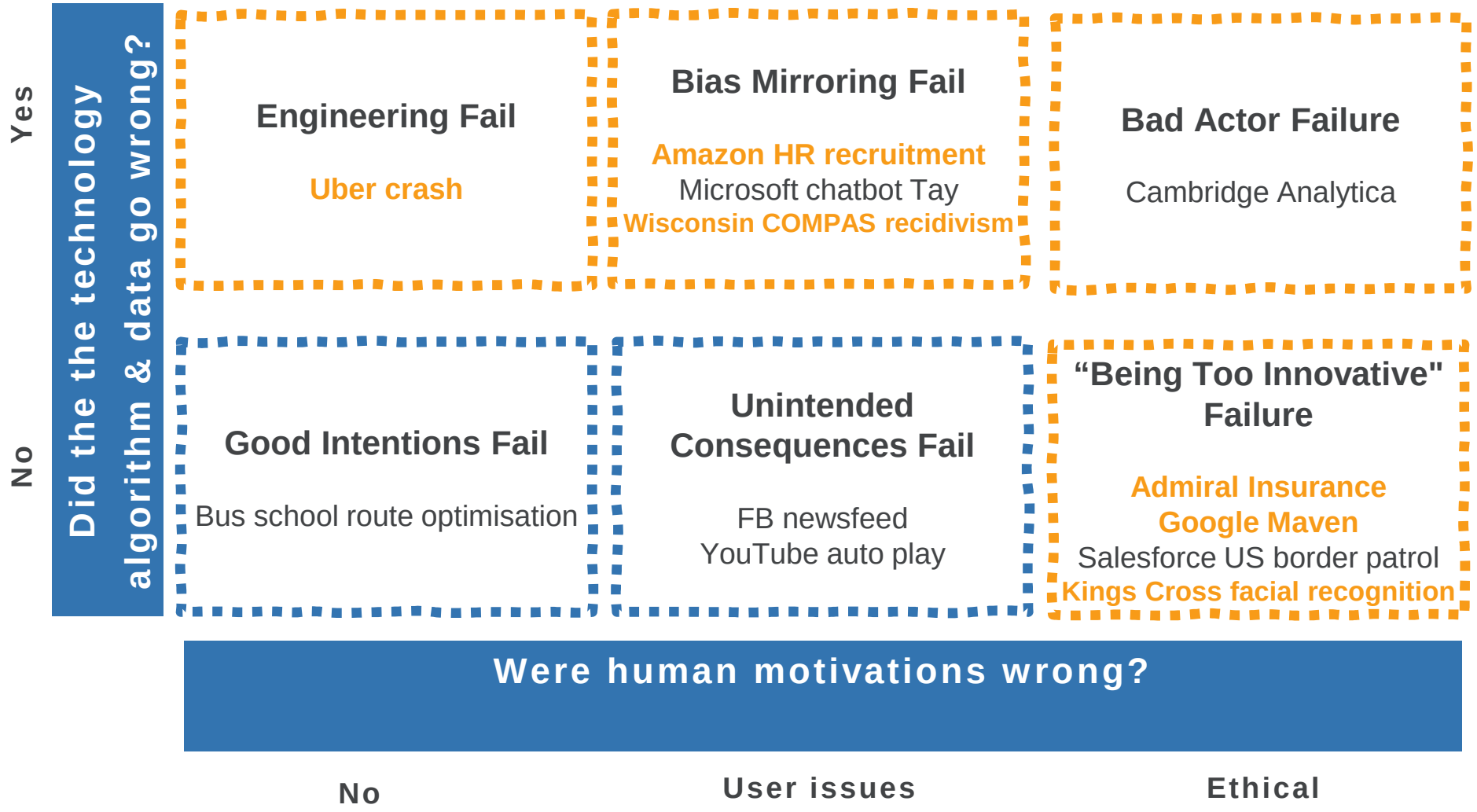


Deep neural networks are often described as black boxes and it is harder to understand their decision making



https://www.youtube.com/watch?v=3JQ3hYko51Y

AI failure is as much about human motivations as technology



https://www.theguardian.com/technology/2019/sep/02/facial-recognition-technology-scrapped-at-kings-cross-development
https://www.nytimes.com/2017/10/26/opinion/algorithm-compas-sentencing-bias.html
https://medium.com/mps-seminar-one/less-bad-bias-an-analysis-of-the-allegheny-family-screening-tool-ef6ffa8a56fb

Companies need to develop and implement AI Ethical – Trustworthy AI Guidelines

1. Inclusive, diverse and fair (avoid or don't reinforce bias)
2. Explainable and transparent decision making
3. AI is accountable to people
4. Be built and tested for safety
5. Be socially beneficial
6. Responsible by design

AI Management Consultants

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December 11th, 2019

Realizing the Promise of AI and the *Ethical Considerations for the Use of AI*

Vijayalaxmi Aithani
Corporate External & Legal Affairs, Microsoft Limited

Exploring the ethical use of AI

How can we be sure the actions taken by an AI system are actions that are in our best interests?

The AI dilemma

- AI has great potential to help humans, make technology easier to use and more accessible
- Yet how do we trust that AI won't make decisions or take actions that we would consider unfair or unethical?

Defining your 'north star'

- AI begins with our own data, our own programming, our own people
- We need to define standards and principles based on our core values for how AI is developed and used
- See Microsoft's *The Future Computed* for our view on AI, ethics and values

What is AI?

Technology that can perceive, learn, and reason to extend the capabilities of people and organizations

Microsoft's approach

Make AI available to everyone

- Augment human capability
- AI that builds trust in technology
- Preservation of privacy & security
- AI transparent & open for inspection
- Algorithmic accountability

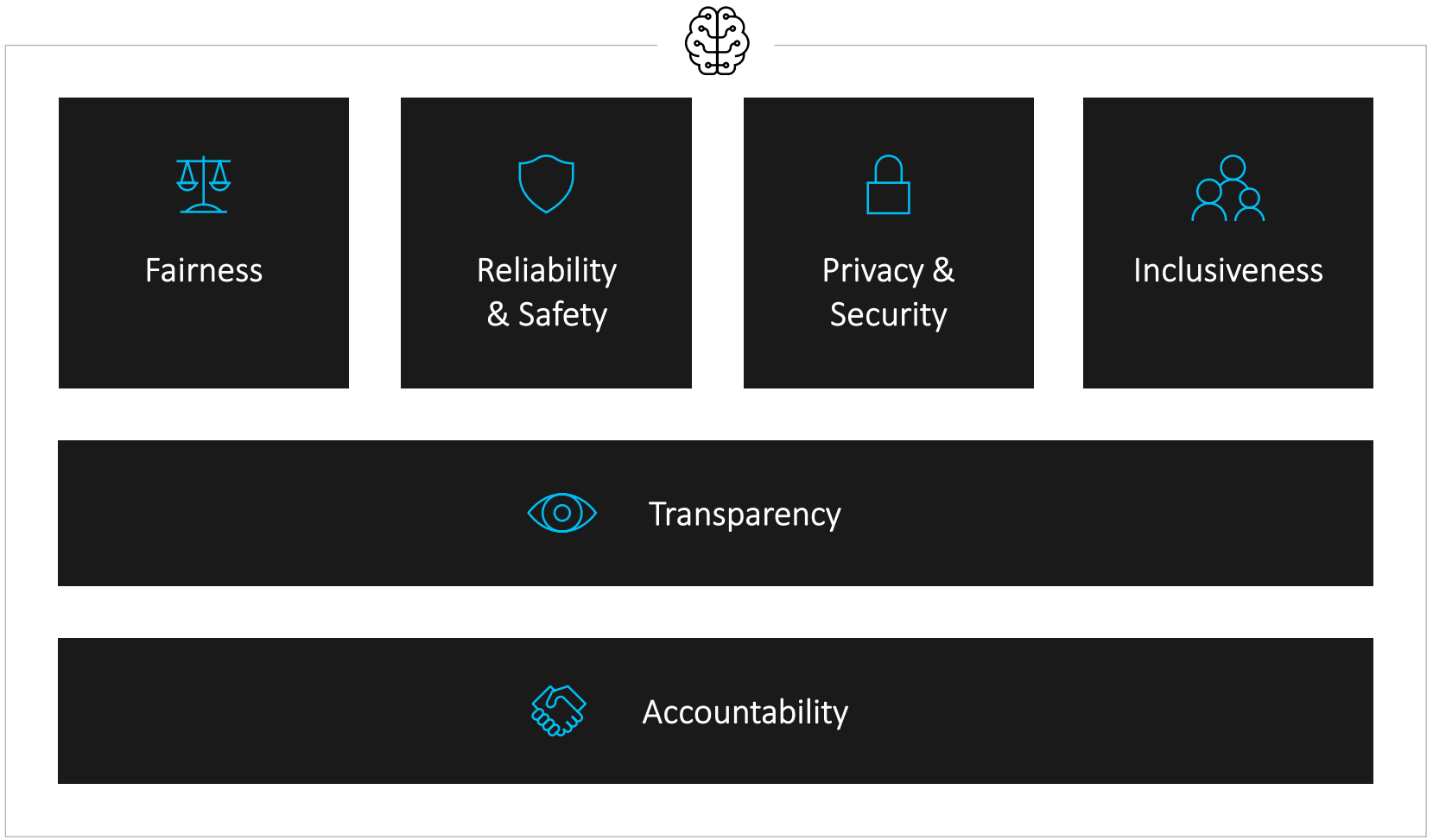
"We are pursuing AI to empower every person and every institution … so that they can go on to solve the most pressing problems of our society and our economy."

Satya Nadella
Chief Executive Officer
Microsoft Corporation

At Microsoft we've thought deeply about AI ethics, and we've come up with

Six Basic Principles for Ethical AI

Design AI to Earn Trust



Fairness

Understand how bias can be introduced and affect recommendations

Attract diverse pool of AI talent

Develop analytical techniques to detect and eliminate bias

Human review and domain expertise

The New York Times

Facial Recognition Is Accurate, if You're a White Guy

By STEVE LOHR FEB. 9, 2018

Gender was misidentified in **up to 1 percent of lighter-skinned males** in a set of 385 photos.

Gender was misidentified in **up to 12 percent of darker-skinned males** in a set of 318 photos.

Gender was misidentified in **up to 7 percent of lighter-skinned females** in a set of 296 photos.

Gender was misidentified in **35 percent of darker-skinned females** in a set of 271 photos.

Reliability & Safety

Evaluate training data

Test extensively (and enable a user feedback loop)

Monitor ongoing performance

Design for unexpected circumstances—including nefarious attacks

Human in the loop

Privacy & Security

Existing privacy laws (e.g. the General Data Protection Regulation) apply

Provide transparency about data collection and use, and good controls so people can make choices about their data

Design systems to protect against bad actors

Use de-identification techniques to promote both privacy and security

Inclusiveness

Inclusive design practices to address potential barriers that could unintentionally exclude people

Enhances opportunities for those with disabilities

Build trust through contextual interaction

EQ in addition to IQ

Transparency

People should understand how decisions were made

Provide contextual explanations

Make it easier to raise awareness of potential bias, errors and unintended outcomes

Accountability

People must be accountable for how their systems operate

Norms should be observed during system design and in an ongoing manner

Role for internal review boards

Ethical Framework Considerations

Enable broad deployment and continued innovation:

- Multi-stakeholder dialogues
- Practical principles for trustworthy and human-centered AI
- Sharing of best practices
- Funded research & development
- Data availability
- Skills training

Facial recognition technology

The need for public regulation and corporate responsibility

6 PRINCIPLES

Fairness

Transparency

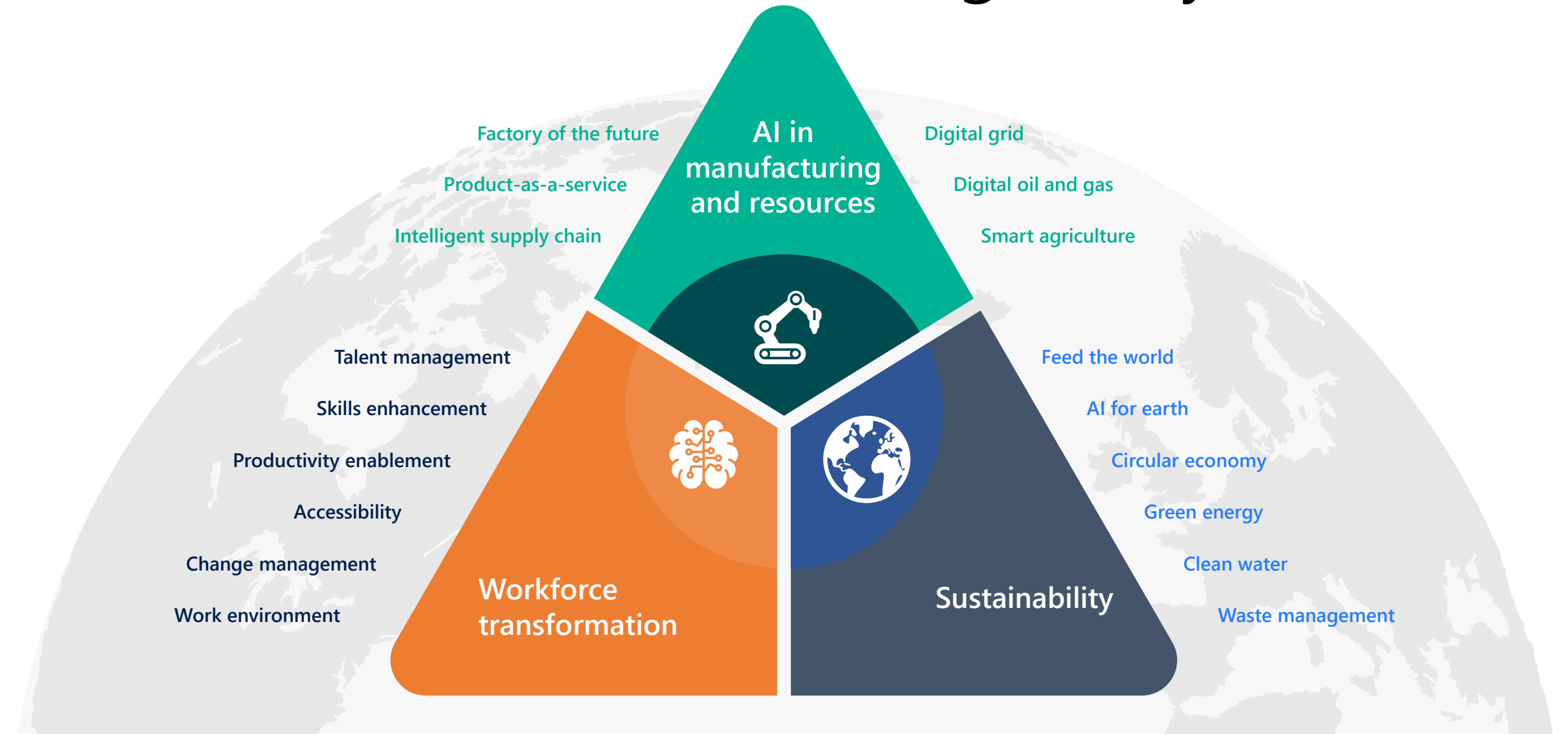
Accountability

Non-discrimination

Notice and consent

Lawful surveillance

AI in Manufacturing Today



Looking ahead: AI for Mission Critical Uses?

Question

Once trust is established, will policy makers or industry require the use of AI technology for mission critical scenarios where lives or scarce resources are at risk?

Emerging issues

- Accelerating trust and ethics in AI
- Governments role in promoting trust (e.g. regulation of facial recognition)
- The impact of AI on our workforce
- Skilling and Reskilling

Thank you!

Panel discussion

Is ethical AI also relevant to smaller companies?

Panel discussion

§ AI

What lessons can we learn from GDPR compliance, particularly around the importance of getting ahead?

Panel discussion

Does ethical AI require wholesale structural changes to an organisation (e.g. is it a question of culture) or is it a micro-level issue?

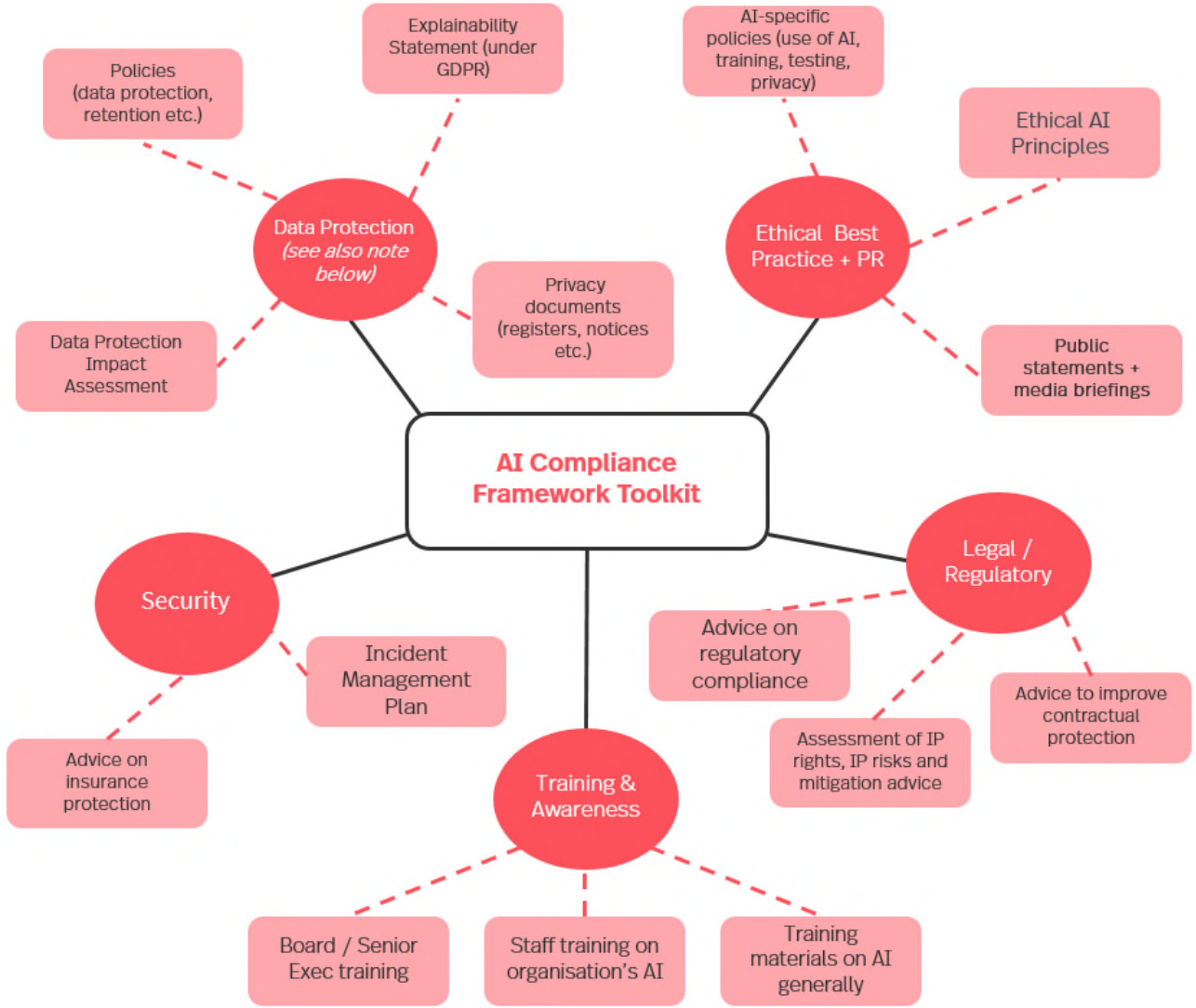
Panel discussion

What are the commercial advantages to using AI ethically?

How we can assist in implementing ethical / responsible AI

- Healthcheck of your organisation's use of AI
- Building Compliance Framework

How we can assist in implementing ethical / responsible AI



Session 2: Liability risks and lessons from the *Tyndaris* case

Structure

- The *Tyndaris* case

  Minesh Tanna, Simmons & Simmons

- Potential liability arising from AI

  Jacob Turner, Fountain Court Chambers

- Macro risks for organisations using AI

  Paul Baker, Simmons & Simmons

The *Tyndaris* case

Facts

- Claimant: Tyndaris SAM (Tyndaris):
  - Investment manager regulated by Monaco financial services regulator
- Defendant: MMWWVWM Limited (VWM):
  - SPV owned by Mr Li
- By contract, Tyndaris agreed to provide investment management services (i.e. trading on stock markets) to VWM in return for fees
- According to Tyndaris, fund's investment decisions would be based on trading signals created by algorithmic AI system (K1 system)

The *Tyndaris* case

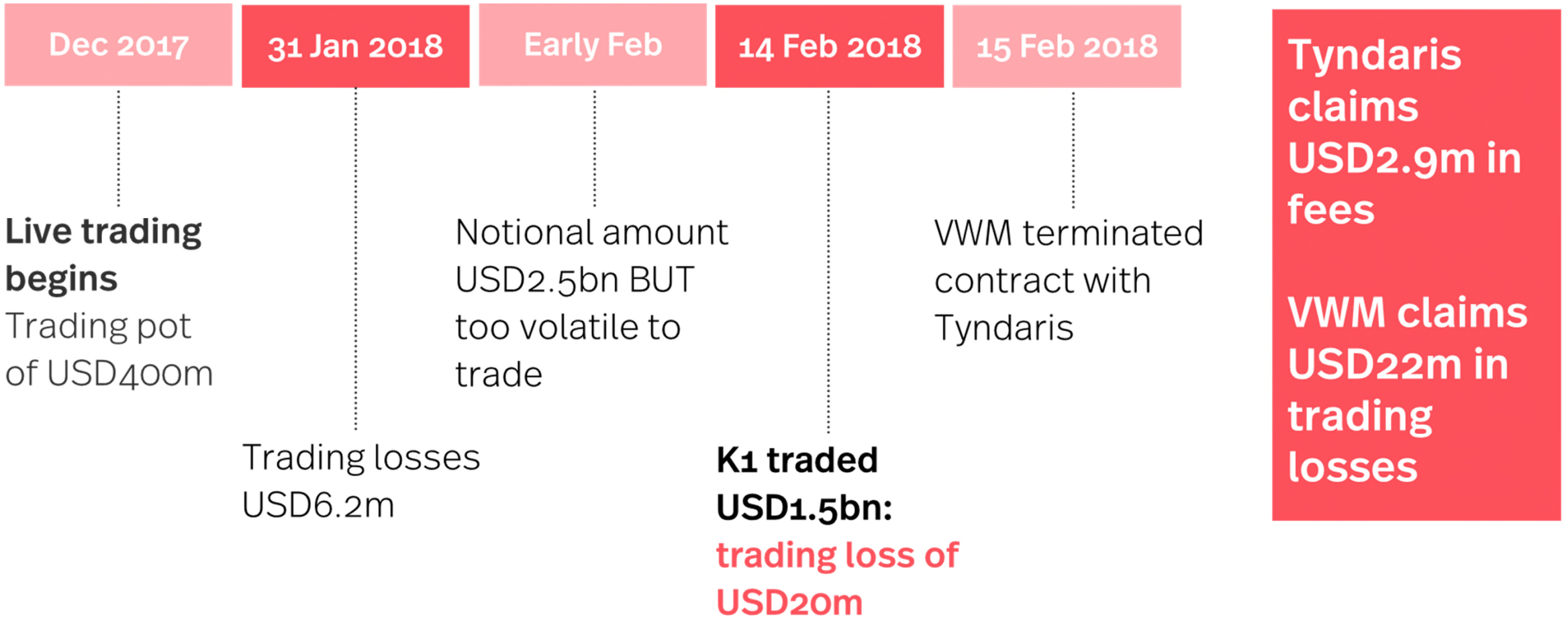
K1 system

- According to Tyndaris, K1 system operates as follows:
  - Contemporaneous data collected from various sources (news, social media) and analysed by K1 to predict movements on various markets based on public sentiment
  - If sentiment suggests sufficiently strong indication in particular direction, K1 generates signal to recommend trading
  - Signal received by computerised trading system, which measures various metrics (e.g. volatility, volume, price movements) and places trades
  - Stop-losses programmed into trading system which automatically generates instruction to liquidate positions on markets if limits are triggered (i.e. to protect position)

- K1 system had been tested:
  - “Back-testing” – simulated trading based on actual sentiment data
  - Live-testing – actual trades based on actual sentiment data

The *Tyndaris* case

Trading losses



The *Tyndaris* case

VWM's claims

Alleged breaches of contract	Alleged misrepresentations
Tyndaris breached warranty that it had "*requisite knowledge and skill relevant to the services for which it is engaged*"	Tyndaris had expertise to use system to manage fund
Tyndaris breached obligation to act as "*prudent professional discretionary manager*"	Back-testing / live-testing had been rigorous and sufficient to model live performance
Tyndaris failed to manage investment portfolio in accordance with terms of Agreement (including details as to how K1 system would operate)	K1 would automatically place and close trades taking into account various factors
	Investment strategy used pre-defined and disciplined rules to set stop losses and trailing profit stops (TPS) algorithmically determined by K1 (without human discretion)

The *Tyndaris* case

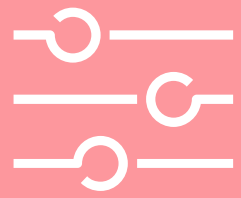
Key issues

Fitness for purpose

Is the AI system fit for its intended purpose (data, algorithms, model, output)?

Understanding the AI system

Does the user understand how the AI system operates and can it explain the output?



Testing of the AI System

Has the AI system been tested (including in the right conditions)?

Marketing the AI System

How has the AI system been described in marketing material or in sales pitches?

Fountain Court
CHAMBERS

Potential Liability arising from AI

Jacob Turner
Simmons & Simmons
11 December 2019

Topics

1. Uniqueness of AI

2. Novel Liability Issues:

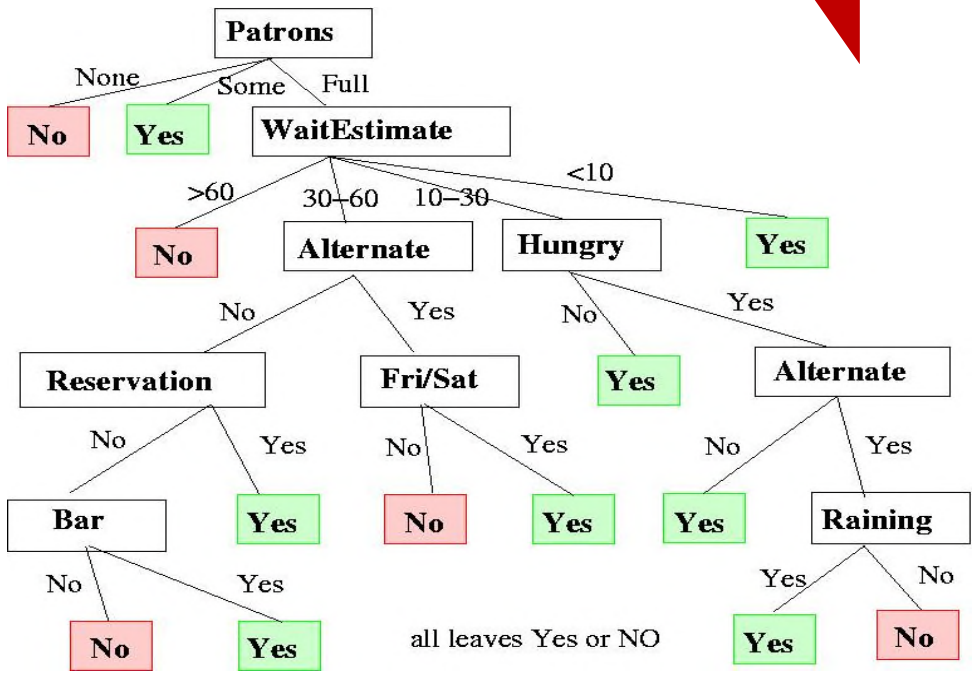
    a) Contract
    b) Tort
    c) Product Liability
    d) Statute

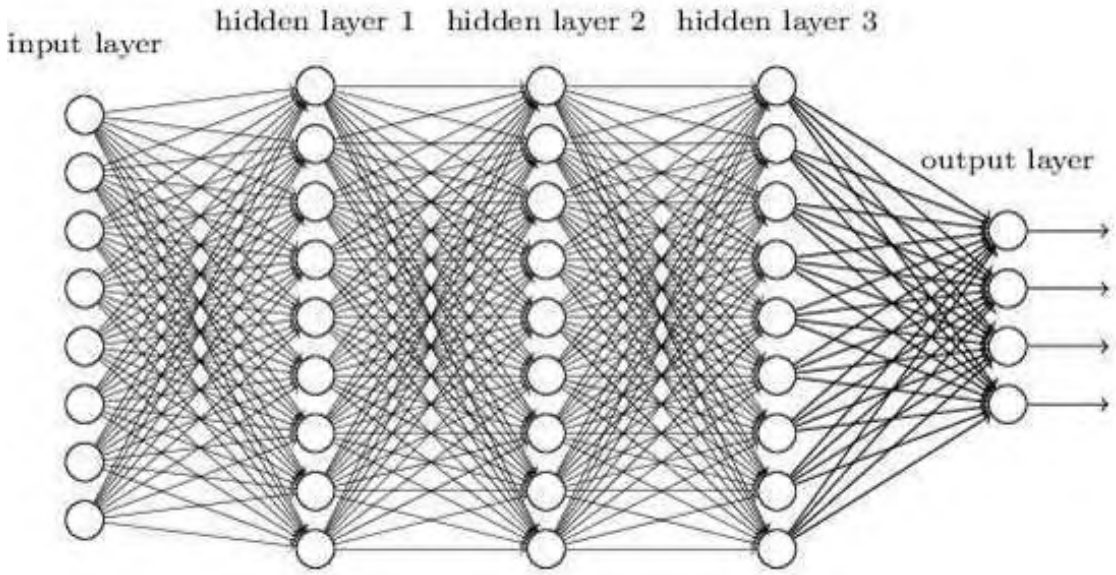
3. Insurance

(1) Uniqueness of AI

Automation

Autonomy





Independent Development →

- AlphaGo: Game 2, Move 37
- AlphaGo Zero

→ Independent agency

World Champion Lee Sedol competing against AlphaGo

(2) Novel Liability Issues

Contract: B2C2 v Quoine Pte [2019] SGHC(I) 03

- **Liability for acts of AI *under* a contract**
  - *Tyndaris* case

- **Consequences if AI *makes* a contract:**
  - AI not (yet) a legal person
  - Therefore need to determine issues of agency, vicarious liability etc.

Contract: B2C2 v Quoine Pte [2019] SGHC(I) 03

- **Background**
  - Due to a defect in Quoine's software, trades were executed at 250 times the Ethereum and Bitcoin market exchange rate, as requested by B2C2's software.
  - The next day Quoine's Chief Technology Officer cancelled the trades.
  - Did B2C2 know that the price was so abnormal that no trader would trade at that price otherwise by way of a mistake? If so then trades could be cancelled.

- **First Instance Judgment (Thorley J):**

  "208 …. **The algorithmic programmes in the present case are deterministic, they do and only do what they have been programmed to do. They have no mind of their own.** …. No different to a kitchen blender relieving a cook of the manual act of mixing ingredients"

  211 Accordingly, in my judgment, **in circumstances where it is necessary to assess the state of mind of a person in a case where acts of deterministic computer programs are in issue, regard should be had to the state of mind of the programmer of the software of that program at the time the relevant part of the program was written**."

Tort

- When is it reasonable for a human to rely on the technology?
- When is it reasonable for a human *not* to rely on the technology?
- Special situations:
  - *Bolam v Friern Hospital Management Committee* [1957] 1 WLR 582 test for doctors: if decision is in accordance with “responsible body of medical opinion”, then it is not negligent.
  - e.g. June 2018: Babylon (AI healthcare provider) claims to be more accurate than human doctors.
- Do we need new standards for AI? What is reasonable foreseeability when one is talking about creative unpredictability? What is a relationship of sufficient proximity where many actors?
- Current law is human centric - reasonable computer?
- What does “causation” mean in the context of distributed AI?

Product liability

- **Threshold Question:** Is AI a product or a service within the meaning of relevant statutes?
- **Substantive Questions**: Is emergent behaviour a "defect"?
- **EU -** Products Liability Directive (85/374/EEC)**:**
  - Position of non-embedded software uncertain – see definition of "product" in Art. 2 – "all movable objects, even when incorporated into another moveable or into an immovable object"
  - EU consulting on impact of AI on Products Liability Directive
- **US -** Restatement (Third) of Torts: Products Liability:
  - *Winter v. G. P. Putnam's Sons* 938 F.2d 1033 (9th Cir. 1991): "[c]omputer software that fails to yield the result for which it was designed" is to be treated as a product and therefore subject to product liability law
  - Is unintended, autonomous behaviour of AI a "defect" of: (a) design; (b) instruction or warnings; and/or (c) manufacturing? Defences?

Statute

Automated and Electric Vehicles Act 2018

- s.2(1) Where— (a) an accident is caused by an automated vehicle when driving itself… (b) the vehicle is insured at the time of the accident, and (c) an insured person or any other person suffers damage as a result of the accident, the insurer is liable for that damage…

- s.5(1) Where— (a) section 2 imposes on an insurer, or the owner of a vehicle, liability to a person who has suffered damage as a result of an accident … any other person liable to the injured party in respect of the accident is under the same liability to the insurer or vehicle owner.

(3) Insurance

Potential Conditions of Coverage

- Warranties:
  - Compliance with legal standards (if any)
  - Compliance with industry standards (i.e. ISOs IEC JTC 1/SC 42)
- Requirement for human oversight
- Off-switch
- Explainability (especially where GDPR likely to apply)
- Regular audits of AI systems
- Keep record of all data fed into AI (potential for blockchain use)
- Explicit limitations on scope of coverage for liability arising from AI

Fountain Court
CHAMBERS

Contact:

- jnt@fountaincourt.co.uk
- @robotrules
- www.robot-rules.com

Macro risks for organisations using AI

Organisational culture

- AI as a positive influence on culture
- Accountability, transparency and improvement
- Senior management’s comprehension of the risks

Macro risks for organisations using AI

§ AI

Data management and security

- Responsibilities and risks of using personal data
- Security risks – a target for attacks?
- Follow on liability, including regulatory risks (British Airways and Marriott)

Macro risks for organisations using AI

Reputation management

- Benefits and risks to reputation from using AI
- Shareholder expectations regarding protection of reputation
- Unintended legal risks – defamation?

Macro risks for organisations using AI

Class actions / Collective redress

- Increasing level of potential and actual claims as a result of:
  - simpler routes to liability - *Lloyd v Google*
  - being able to identify and coordinate claimants quickly
  - a rapidly expanding and increasingly sophisticated litigation funding market

Session 3: Employment and IP risks from AI

Structure

- Employment / HR and AI

  Audrey Williams, Simmons & Simmons

- Intellectual Property and AI

  Priya Nagpal, Simmons & Simmons

Employment/human resources and AI

AI deployment in the workplace

- Increasingly used, for example AI can:
  - Compile lists of candidates for a job
  - Review job applications and CVs for shortlists
  - Assist in performance management and review
  - Answer frequent questions from employees
  - Support wellbeing/workplace issues – monitoring
  - Training/coaching – chatbots

AI in the workplace

Bias and discrimination –AI better than humans?

- In principle, AI should be capable of reducing bias:
  - AI can process vast amounts of data and detect complex patterns, ensuring consistency and fewer “rogue” decisions
  - Machines can be taught to recognise and eliminate bias
  - Humans are affected by unconscious and e.g. “anchoring”, where humans allow their personal experiences to affect their decisions

AI in the workplace

Risks: bias and discrimination eliminated?

- AI: also capable of bias and can reinforce the problem:
  - AI is dependent on data, so any incomplete input data can skew the model used to make decisions
  - input data may already reflect human bias, in which case the model will incorporate this bias
  - input data may incorporate “sampling bias” where the data is not sufficiently representative or diverse
- Deficiencies in the underlying data

AI in the workplace

Human intervention / risk

- A common misconception no need for human oversight
- Humans need to continuously evaluate and test
- In an employment context equality is crucial and adjustments/accommodation/justification assessments needed
- How to deal with “atypical” candidates/employees – Equality Act 2010

- Vicarious Liability – Employer liable for decision making and discrimination

Impact on Workplace & Culture

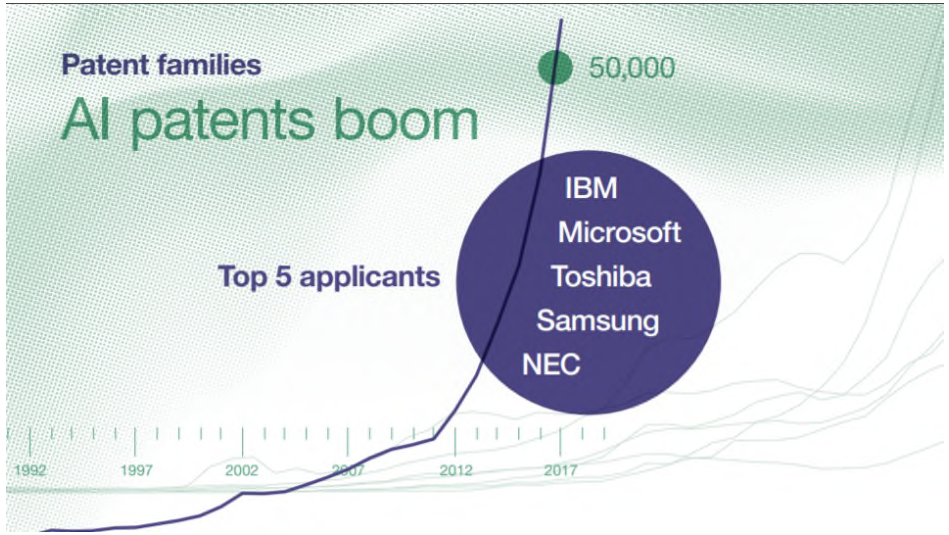
AI will also impact on existing and future workforce needs:

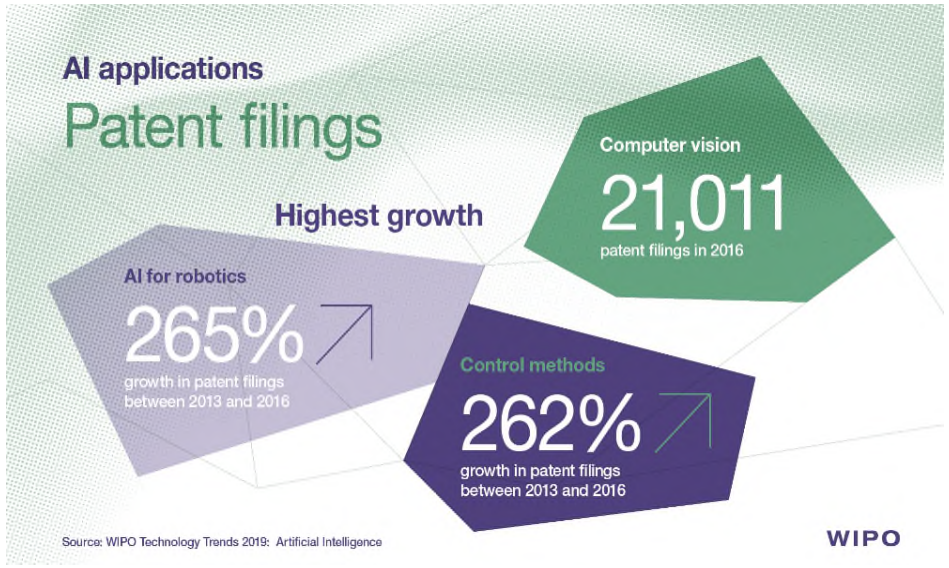
- Talent management and skills for the future - AI deployment – role changes, resistance to change, training & development
- Trust in technology
- Wellbeing aspects and H&S – volume and nature of work/work environment, intensity/speed of work and outputs
- Human intervention in measuring output, decision making and assessment

IP protection for AI

Patents

- Surge in the number of patent applications for AI-related inventions.
- Challenging to navigate provisions on excluded subject matter.
- How to detect infringement?





IP protection for AI

Trade Secrets

- Information needs to be proprietary and have requisite quality of confidence.
- Under Trade Secrets Directive, “reasonable steps” must be taken to keep information secret.
- Claim if actual or threatened disclosure/misuse of confidential information.

Copyright

- Computer programs protected as literary works.
- Protection extends to expression of program, but not to “*ideas, procedures, methods of operation and mathematical concepts as such”.*
- More challenging to prevent non-literal copying.
- Database right for datasets.

IP created by AI

The Next Rembrandt

IP created by AI

Patents

- Patent applications filed by University of Surrey, naming Dabus AI as the inventor

als Erfinder²: / do hereby designate as inventor(s)²: / désigne(nt) en tant qu'inventeur(s)²:

DABUS – The invention was autonomously generated by an artificial intelligence
1767 Waterfall Dr.
St Charles 63303
Missouri

- Is a human inventor required?
  - ✓ UK IP Office
  - ✓ European Patent Office
  - ? US Patent Office

"Do current patent laws and regulations regarding inventorship need to be revised to take into account inventions where an entity or entities other than a natural person contributed to the conception of an invention?"

Q3, Request for Comments on Patenting Artificial Intelligence Inventions USPTO, 27 Aug 2019

IP created by AI

Copyright

- “Originality” assessed by reference to author’s skill and creativity.
- In the UK, s.9(3) CDPA 1988 defines author for “computer-generated works”.
- US and Chinese courts’ approach suggests copyright only vests in human authors.

AI Collaborations

Some IP issues

- Common issues in collaborations:
  - foreground/background IP;
  - right to own/use IP;
  - during/outside/after project;
  - non-compete clauses.

AstraZeneca starts artificial intelligence collaboration to accelerate drug discovery

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