



The Ethics & Regulation of Artificial Intelligence

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Introduction

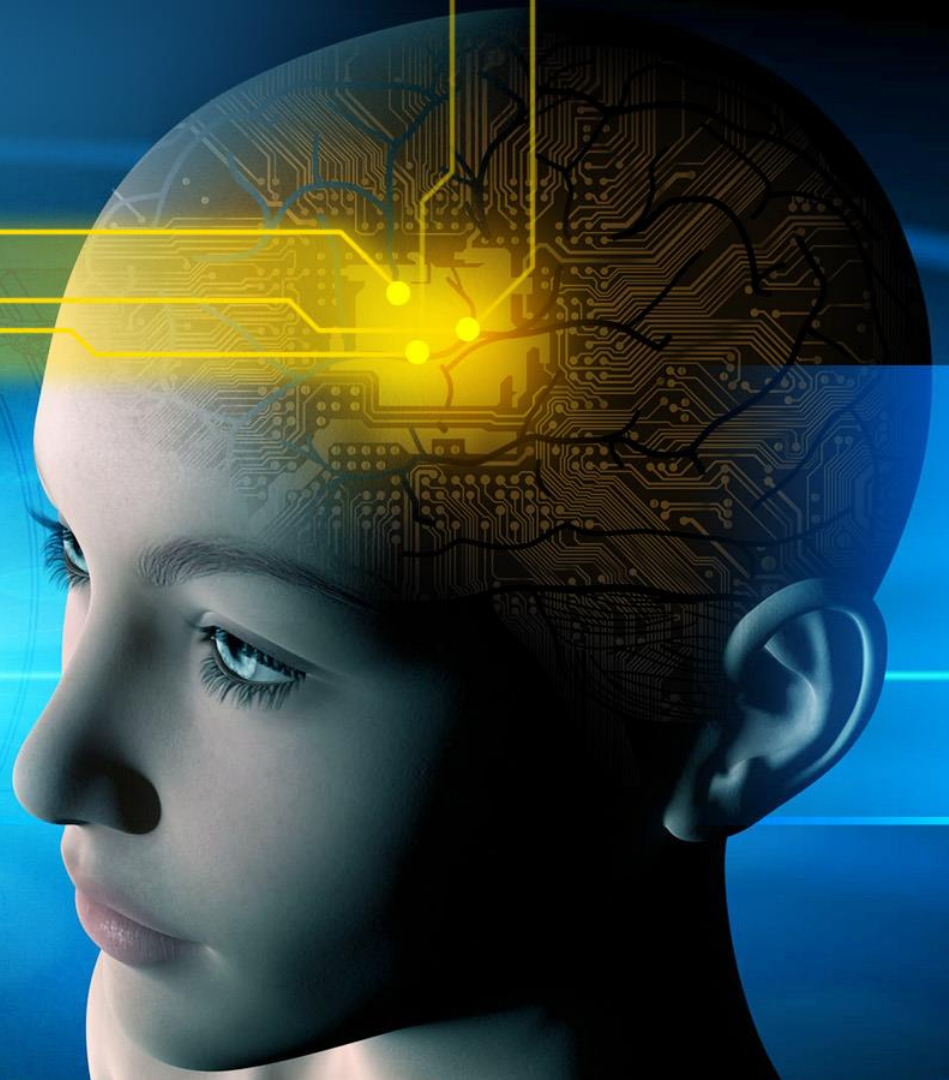
- This presentation focuses on the ethical and regulatory issues raised by the design, specification, development, deployment and use of AI
- Adoption of AI and Machine learning (ML) have triggered alarm, regulatory and ethical debates around the world
- Issues arising from how ML algorithms can learn on their own, black-box and mathematical attributes of machine learning
- Historically, laws have been drafted on the premise of human decision makers – e.g. refer to Australian *Tax case: Pintarich v ATO*
- However, human developers play a role in the design, specifications, uses and deployment

Topics

1. **Where are we now with AI?**
2. **Whose Ethics?**
3. **Ethical Issues Arising from AI**
 - **Bias and Discrimination**
 - **Misuse of AI – Fake news and information**
 - **Use of AI in Workplace Surveillance**
4. **AI and Implications on Employment**
5. **Regulation of Artificial Intelligence**
6. **Case Study: The line between Humans vs Robots**

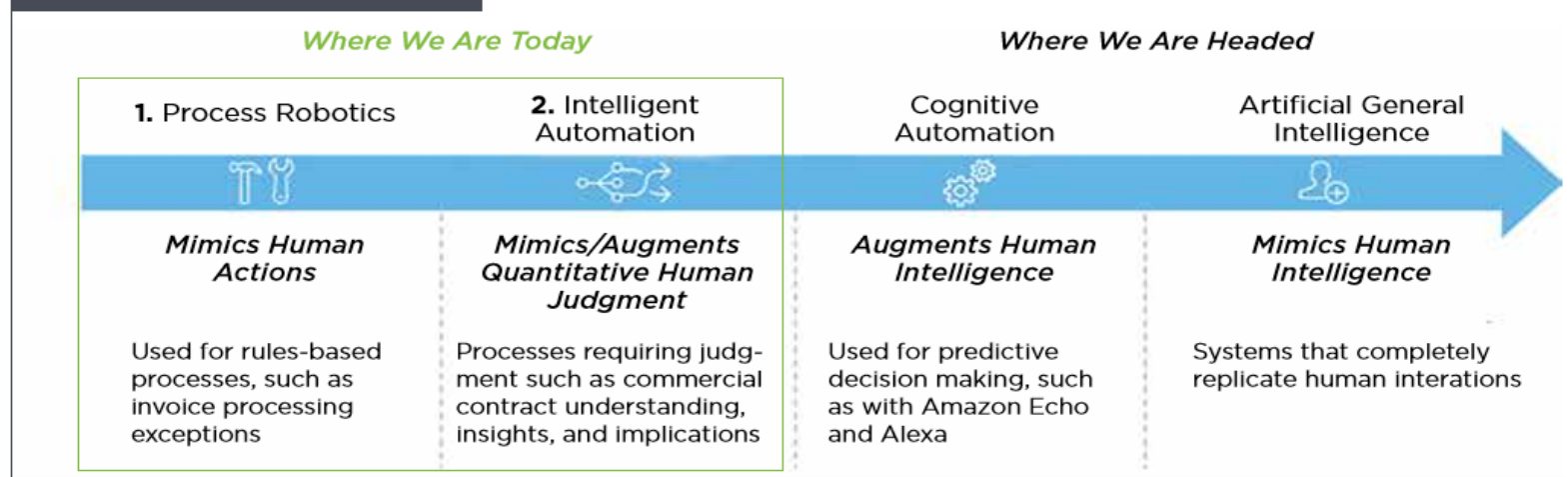


**Where are we now
with AI?**



Where are we now with AI?

Figure 1. AI Maturity Levels



- For the first time, technology is not only automating the repetitive and the manual, but also gradually supplementing and mimicking our “minds”

Why Robots & AI?

Why robots?

- Work 24/7
- Don't get paid
- Don't complain
- Don't need breaks
- Increased production rate
- Generally, Reliable repeatable results

Why AI?

- Work 24/7
- Don't get paid
- Don't complain
- Don't need breaks
- Faster, more accurate results
- Better at processing volumes of data
- Entirely new possibilities arise

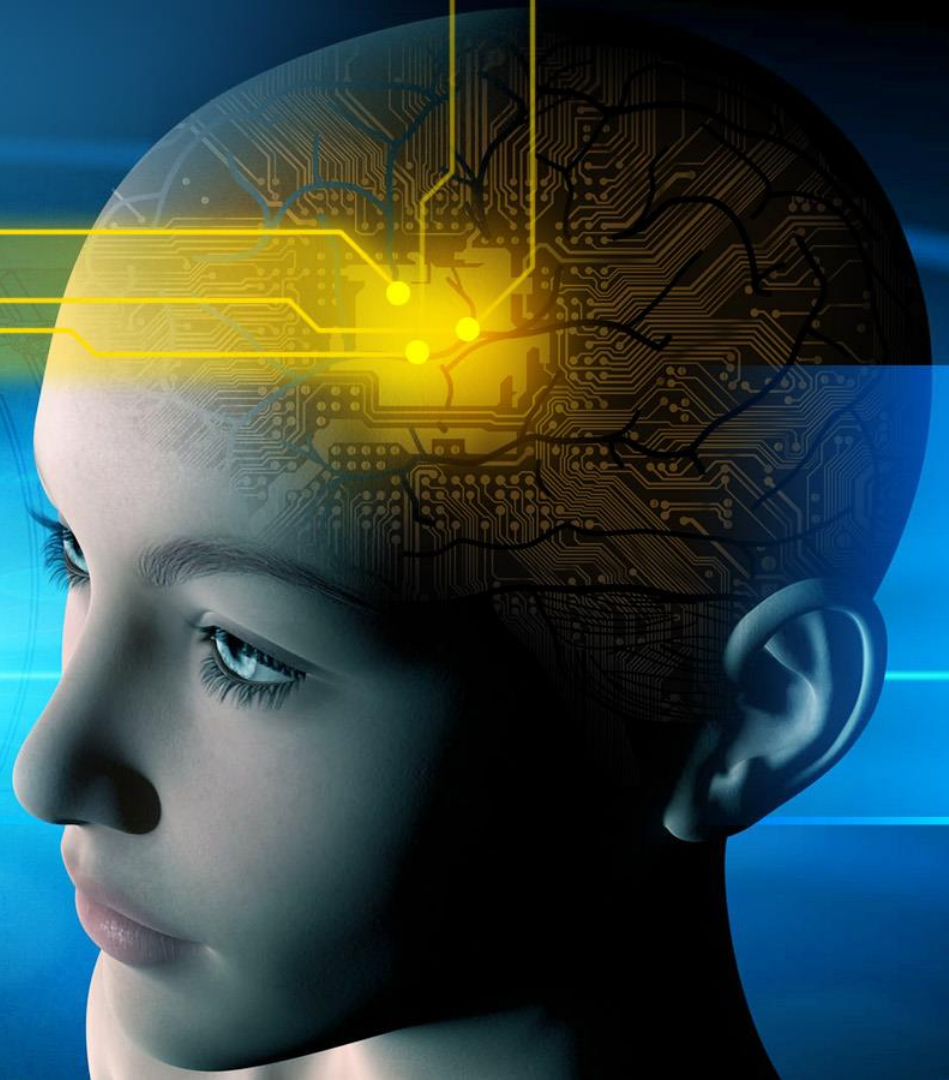


Whose Ethics?

- If ethical parameters are programmed into AI, whose ethical and social values are they?
- Each individual, sociocultural group, religion and national geography can have different attitudes to ethics, morality and legality
- As machine learning develops and algorithms get more complex over time, it will be difficult to articulate and understand the inner workings
- Should Social Credit Scores determine whether a person have access to services, credit, jobs?



Ethical Issues Arising from AI



Ethical Issues Arising from AI

- Algorithms can carry inherent biases which are replicated, spread, and reinforced
- Concerns about data fed to machine-learning algorithm developed by engineers - as any data bias, unfairness, bias, discrimination and statistical distortion will be learned and amplified
- When underlying data reflects an inherent bias or pattern that becomes obvious when the algorithm is applied to it?
- So what happens when an algorithmic decision leads to someone being disadvantaged or discriminated against?
- As algorithmic complexity and autonomy increases, it becomes even more important to build in checks and balances to protect the legitimate interests of individuals
- Ethics must travel as AI's associate- Anthony Wong The Australian September 13, 2016, <https://www.theaustralian.com.au/business/technology/ethics-must-travel-as-ais-associate/news-story/a2b6c2fe8b01491e9efe6acdc55b91e9>

Examples of bias and discrimination

- ❑ Microsoft Tay chatbot corrupted in 24 hrs
 - ❑ Taught racist, hate and abusive speech through social media
- ❑ Google's image search reveals limits
 - ❑ Biased police mugshots for coloured teenagers in the United States
- ❑ Amazon scraps secret AI recruiting tool that showed bias against women*
- ❑ US criminal justice system where judges assess whether an accused should be held in custody pending trial, or the likelihood that a criminal will re-offend and access to rehabilitation – e.g. COMPAS used to help decide prison sentences, where decision skews on the basis of race
- ❑ The 'Intelligent' car: what if an autonomous vehicle is programmed with an algorithm that would, in a crash situation, 'sacrifice' the life of a pedestrian over that of the vehicle's owner?

Misuse of AI – Fake news and information

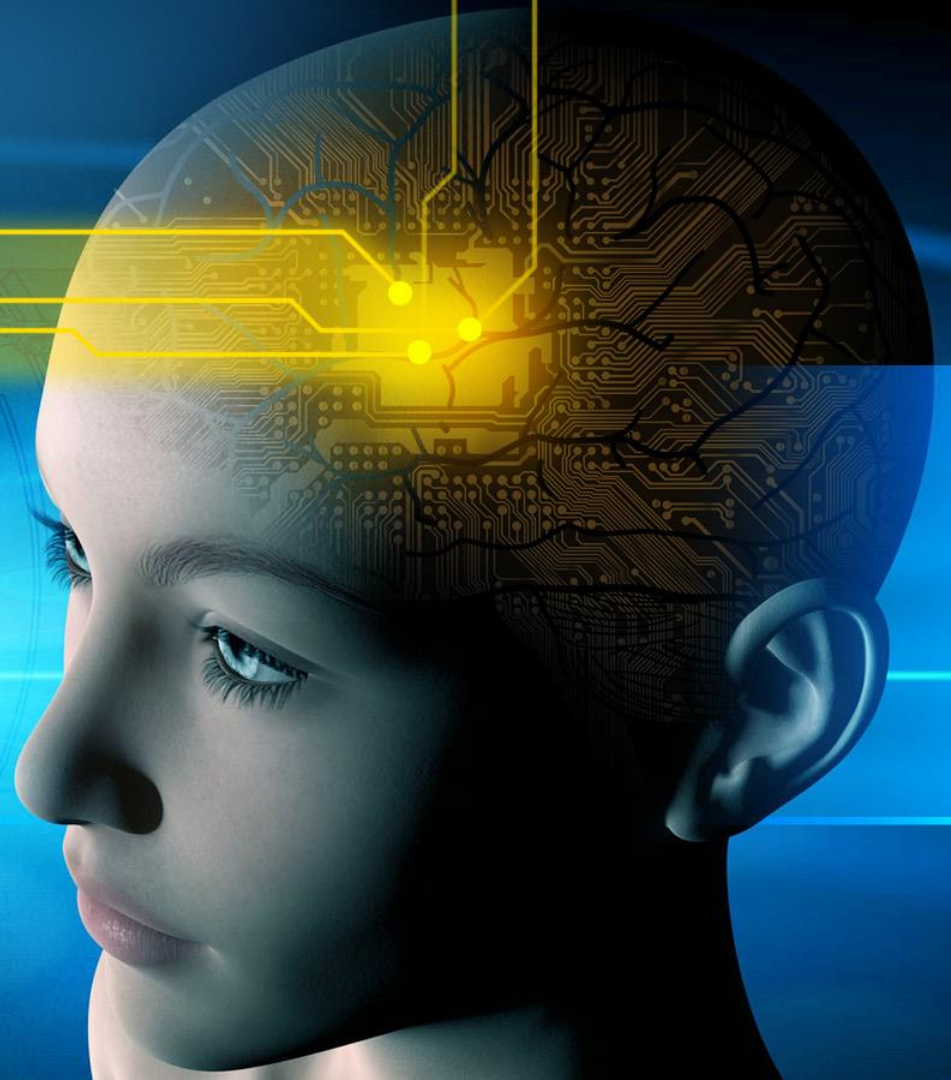
- Misinformation, fake news, propaganda to manipulate people
- People profiling to create microtargeting information to manipulate people
- Examples in elections, BREXIT and Cambridge Analytica

Use of AI in Workplace Surveillance

- As AI and IoT sensors embrace the workplace to monitor performance, improve productivity — a fairer safer workplace or more oppressive?
- Using AI, organisations gain extraordinary insights over work practices of their workers:
 - Amazon has patented a wristband that tracks the hand movements of warehouse workers and uses vibrations to nudge them into being more efficient*
 - Humanyze, sells smart ID badges that can track employees around the office and reveal how well they interact with colleagues*
 - Cogito, Ai-enhanced software that listens to customer-service calls and assigns an "empathy score" based on how compassionate agents are and how fast and how capably they settle complaints*
 - AI to sift through not just employees' professional communications including emails and social-media profiles using analytics tools?
 - video cameras with AI in the workplace to monitor activity including identifying employees and personnel to ensure correct personal protection equipment
 - Westpac to monitor employee performance and mood in bank's work spaces**
 - Ai Bot (Spot) that uses natural language processing to document harassment and discrimination at work
- What are the Implications on privacy, job security, bias and economic equality?



AI and Implications on Employment



AI and Implications on Employment

1. What is the employment relationship? employees/contractors?
2. Current labour and employment law will not apply? do not get sick, do not pay tax and working times do not apply; not subject to minimum wage and overtime pay requirements?
3. Lease robots (cheaper) for a fee vs salary for workers? Payroll tax for robots and AI?
4. Workplace Safety? Robots may hurt co-workers - which liability rules apply for wrongful acts? Vicarious liability!
5. Performance Management and Control? For work previously undertaken by employees working under a collective bargaining agreement – now performed by AI/robots?
6. Trade Secret Protection and Covenants Not-To-Compete?
7. Data protection and Privacy for personal information collected, consumed by?
8. Cyber security (criminal use or attacks)

Job Security

Automation And Impact On Work

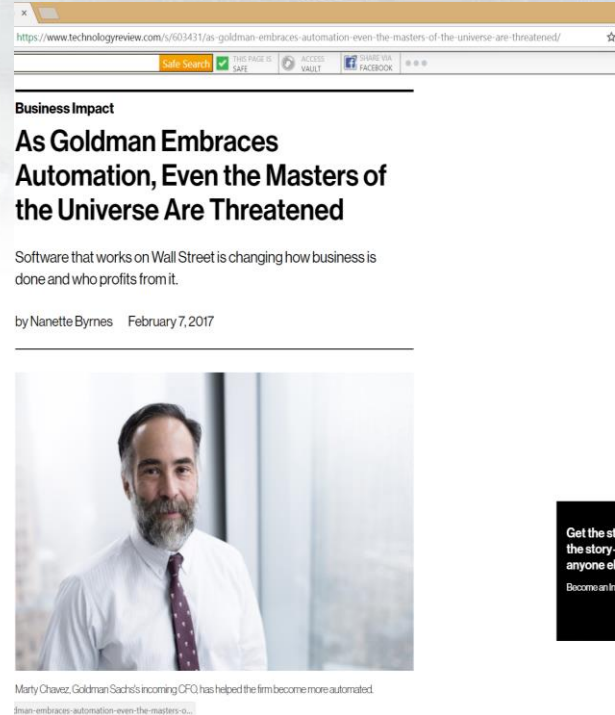
REPORT	Frey and Osborne	McKinsey Global Institute	PwC	World Economic Forum
Date	Sept 2013	Jan 2017	2017	2018
Unit of Analysis	Jobs/ occupations	Work activities	Jobs/tasks	Tasks
Scope	US labour market over 702 occupations	46 countries representing 80% global labour force	UK and other major economies	Across 12 industries studied
Predict At Risk	47% (over two decades)	45% (over two decades)	38% (by 2030)	42% (by 2022)

Sources: Including McKinsey Global Institute -- A Future that Works: Automation, Employment and Productivity

Job Transition and Impact on Professionals

- Goldman Sachs employed 600 equity traders in 2000. Today, there only 2
- Automated trading programs have taken over the work – supported by 200 computer engineers
- “...four traders can be replaced by one computer engineer. Some 9,000 people, about one-third of Goldman's staff, are computer engineers.”*

<https://www.technologyreview.com/s/603431/as-goldman-embraces-automation-even-the-masters-of-the-universe-are-threatened/>



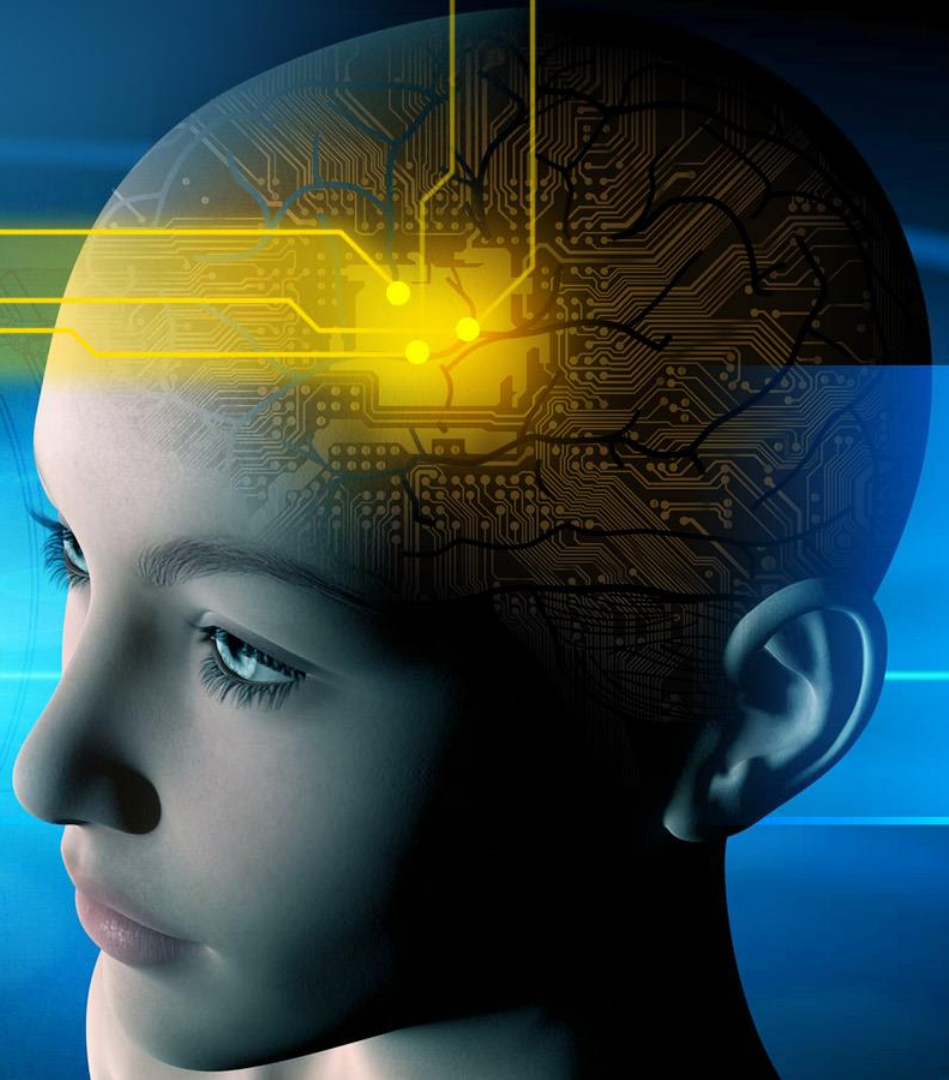
The screenshot shows a web browser window displaying a news article. The URL in the address bar is <https://www.technologyreview.com/s/603431/as-goldman-embraces-automation-even-the-masters-of-the-universe-are-threatened/>. The article is categorized under "Business Impact" and has the title "As Goldman Embraces Automation, Even the Masters of the Universe Are Threatened". The sub-headline reads: "Software that works on Wall Street is changing how business is done and who profits from it." The author is identified as "by Nanette Byrnes" and the date is "February 7, 2017". Below the text is a photograph of Marty Chavez, a man with a beard wearing a white shirt and a patterned tie. A small caption below the photo states: "Marty Chavez, Goldman Sachs's incoming CFO, has helped the firm become more automated." In the bottom right corner of the screenshot, there is a black box with white text that says "Get the story anyone else. Become an I."

Future bright for ICT Professionals

- Demand for software technologists will grow with machine learning, AI, deep learning, product design and research into new areas of robotic
- ICT in the main driving seat - driving the development
- Consider aligned inter-disciplinary skills – e.g. business, marketing, problem solving
- New ICT roles will be created –such as the Chief Data Intelligence Officer

ICT is becoming an integral part of not just one profession, but all professions in the future!

Regulation of Artificial Intelligence



Putting Ethics into practice

- There are 70+ AI Ethical frameworks currently in existence
- Challenge will be putting principles into practice
- In 2019, both Australia and the EU published their frameworks, adding to the lists including the OECD - Principles on Artificial Intelligence, WEF, Canada and the Singapore Model AI Governance Framework
- Conversation has matured significantly in 2019 beyond a list of ethical principles, to guidance on how such principles can be operationalised in the design and implementation in ways that minimise risks and negative outcomes



GDPR and Regulation of AI

- EU General Data Protection Regulation (GDPR) gives individuals the right not to be subject to a decision based solely by automated decision-making (no human involvement in the decision process), except in certain situations including explicit consent and necessity for the performance of or entering into a contract (Article 22)
- Provides data subject explicit rights including:
 - rights to be provided and to access information about the automated decision-making
 - rights to obtain human intervention and to contest the decision made solely by automated decision-making algorithm
 - places explicit onus on the algorithmic provider to provide “meaningful information about the logic involved” in algorithmic decision, the “significance” and the “envisaged consequences” of the algorithmic processing
- Logic behind an algorithm may include confidential trade secrets and other legal concerns, with a forced disclosure potentially risking competitive advantage and trade secrets



ETHICS FRAMEWORK – AUSTRALIA 2019	EU ETHICS GUIDELINES 2019	ITECHLAW RESPONSIBLE AI POLICY FRAMEWORK 2019
Generates Net benefits	Societal and Environmental wellbeing	Ethical Purpose and Societal Benefit
Do no harm	Technical robustness and Safety	Safety and Reliability
Regulatory and Legal compliance	Human Agency and Oversight	
Privacy Protection	Privacy and data governance	Privacy
Fairness	Diversity, Non-discrimination and Fairness	Fairness and Non-Discrimination
Transparency and Explainability	Transparency	Transparency and Explainability
Contestability		
Accountability	Accountability	Accountability
		AI and Intellectual Property
		Open Data and Fair

Legal Persons – intelligent autonomous robots

- Debate about the legal status of AI autonomous systems and robots –re: rights to own IP they create along with liability for problems or negative outcomes associated with their actions
- European Commission has been asked by the European Parliament to consider designating intelligent autonomous robots as electronic persons with specific rights and responsibilities (adopted a resolution on civil-law rules of robotics in Feb 2017, 396 votes for vs 123)
- In an [open letter](#) experts in robotics and artificial intelligence have warned the European Commission that plans to grant robots legal status are inappropriate and would breach human rights
- Self-machine learning capabilities have added complexity to the equation. Will granting ‘electronic rights’ to robots assist with some of these questions?



Regulation & International Standards

- IEEE - Global Initiative on Ethics of Autonomous and Intelligent Systems - standard IEEE P7000 - Model Process for Addressing Ethical Concerns During System Design
 - establishes a process model by which engineers and technologists can address ethical consideration throughout the various stages of system initiation, analysis, design and development
- ISO/IEC JTC 1/SC 42 Artificial intelligence



Case Study:

What is the right balance of
Regulation vs AI Innovation?

Financial Advisers vs Robo-adviser

The line between Humans vs AI by developers

- Australia introduced professional standards legislation ([Corporations Amendment \(Professional Standards of Financial Advisers\) Act 2017](#)):
 - setting higher competence and ethical standards for human financial advisers including
 - requirements for relevant bachelors or higher degrees, continuing professional development (CPD) requirements and compliance with a code of ethics
- Should regulators hold developers and providers of Robo-advice to comparable standards demanded from human actors?
- What should be the background and competence of designers and developers of Robo-advice?



The line between Humans vs AI by developers

- When machine algorithms and decision rules can be opaque and may operate in a “black-box”, can they be designed in a transparent manner which would allow humans to understand (the basis of) their actions?
- If the decision rules are not explicitly programmed by a human but rather inferred from data, and machine learning how do we build in checks and balances – to hopefully ensure, a future of ethical design?
- Complexity of machine learning algorithms involving highly complex code and technical considerations may be well beyond the skill set expected from an average financial services adviser- even to developers



The line between Humans vs AI by developers

- Algorithms are increasingly being used to analyse information, define or predict outcomes with the aid of AI
- Deployed with Robo-advice across financial services and raise many new interesting challenging questions including calls for greater algorithmic transparency to minimise the risk of bias, error and to protect consumer interests
- How much legal and social responsibilities should we give to algorithms shielded behind mathematical “impartiality”?
- How should regulators manage the complexity and challenges arising from the deployment and implementation of Robo-advice and AI in financial services? How do we ensure that Robo-advice can be trusted, transparent, reliable, accountable and well designed?



Who do you sue when AI loses your fortune?

- UK Case - Samathur Li Kin-kan against Raffaele Costa - AI for investment strategies test case as to who is accountable for the losses that results from AI decision-making
- Australian Case - Centrelink Robo-debt welfare recipients negatively impacted including suicide
- People negatively impacted by an AI-based decision may not have the means or knowledge to effectively challenge – support may be required to contest decisions of AI

Concluding Remarks– Key Takeaways

- AI and algorithmic decision-making will over time bring significant benefits to many areas of our human endeavours. The proliferation of AI systems imbued with increasingly complex mathematical modelling and machine learning algorithms are being integrated in virtually every facet of the economy and society, to support and in many cases undertake more autonomous decisions and actions
- Questions are being posed about the intrusion of algorithmic machines into areas previously dependent on human reasoning and judgment
- Algorithmic decision-making is often opaque and complex, and it can be difficult to explain the rationale for its conclusions- raising concerns over accountability, liability, explainability, interpretability, transparency, privacy and human control.
- Addressing these challenges have increased in urgency as the adverse potential impact could be significant. If not appropriately addressed, human trust suffers, impacting on business adoption and oversight and in some cases posing significant risks to humanity and societal values.

Concluding Remarks– Key Takeaways

- AI and robots aren't coming – they're already here! Will Be in Almost Everything
- The nature of work evolves as it always has – and the future will be increasingly automated
- Countries that compete on low-wage labour need to reposition themselves. Price advantage is no longer enough
- It's about activities, not jobs – but some roles will disappear, and new ones will be created
- It is not a Question of Humans Vs Machines, but Humans working (relationships) with Machines!
- Government and industries have important roles in creation of policies, strategies, laws and regulatory frameworks in the transition
- Where are the policies, strategies and regulatory frameworks to transition workers in jobs which are likely to be the most transformed or to disappear due to automation, robotics and AI?



Thank You

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