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How algorithms shape our lives: Evaluating the unseen

Grosvenor Public Sector Advisory

CANBERRA | SYDNEY | MELBOURNE | BRISBANE

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Purpose of this session

This session will give you:

> an understanding of how algorithms operate, and the benefits and risks associated with their use

> how you can optimise the benefits and mitigate the risks by using evaluation

What is an algorithm?

for the purpose of today's session, I use the definition that an *algorithm encompasses artificial intelligence (AI), machine learning (ML) or other computer programs which present information as a result of the machine analysing data with no/little human intervention in the analysis process*

Context for today's discussion

> topic came to the fore following the Facebook 'fake news' and Centrelink robodebt media storms earlier in the year, with severe repercussions for both organisations and their clients

> however, humans have been using algorithms, or systems which achieve the same outcomes, for decades, including:

— recruiter assessment tools

— insurance risk tables

— credit assessments and bank home loan applications

> you are likely unaware of the extent to which algorithms have shaped your life

Some examples of the ways algorithms are used today

Not just for bean counters and tech whizzes, some examples include:

> Uber algorithms connecting cars to riders

> PayPal detecting and addressing money laundering and fraudulent activities

> Enlitic scans medical images to help diagnose and flag cancer

> Facebook algorithms identifying and blocking child pornography content

While these are examples of beneficial algorithms, each of these could have negative consequences if the algorithm were not well-trained and the risks with using the algorithm mitigated

How are algorithms trained?

> algorithms are fed large amounts (millions of lines) of example data sets to learn from, to understand what it should do

> algorithms are directly programmed (coded) less and less these days

> algorithms (and humans) assume the data fed to algorithms is correct

Benefits and risks of algorithms

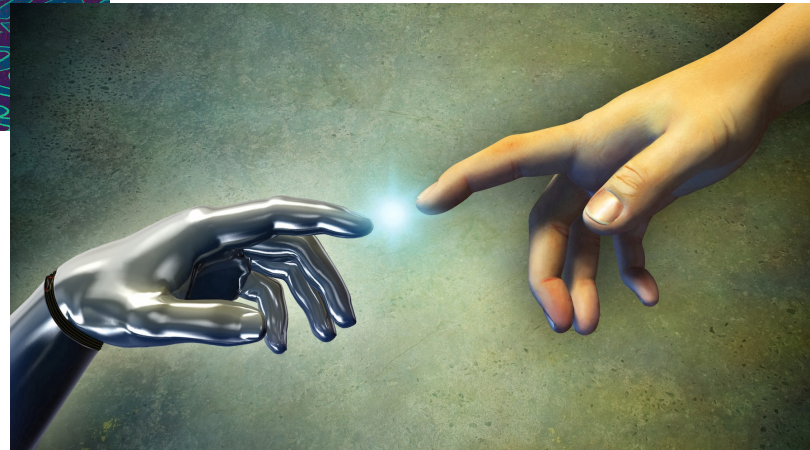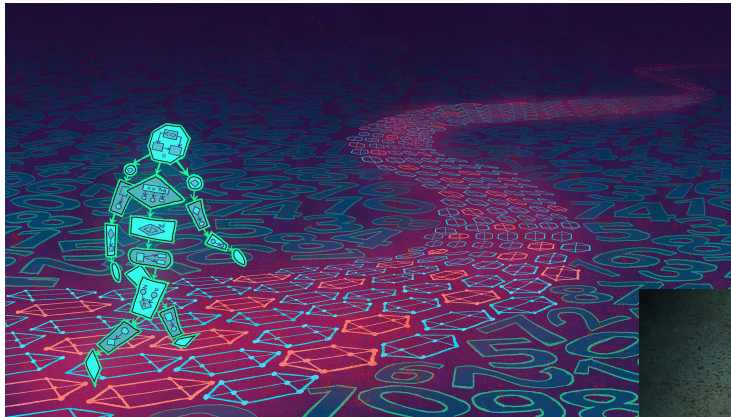| BENEFITS	RISKS
• can complete large, onerous analysis tasks quicker and more effectively than ever before • can connect complex systems together in a way which is difficult to replicate manually • can alleviate bias in some human decision-making • algorithms are improving all the time, with error rates continuing to decrease exponentially	• can inspire false confidence in results, and it can be difficult for humans to identify if an error has been made • the user of the results may not have the right capability (data and social scientist skillsets) to use and interpret the results appropriately • lack of general intelligence can mean that results are not contextually-based • garbage data in = garbage results out • can produce bias in handling minority data sets • can inhibit innovation

A brave new world?

Evaluation to the rescue!

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STAGE	CONSIDERATION
PROGRAM DESIGN	• invest in data and social scientist capability to help with your design, delivery, monitoring and evaluation • strip learning data of demographic connotations where possible, and over-sample minority data if needed • pilot algorithm in parallel with task completed by humans, or real-time data – document and apply learnings
ONGOING MONITORING	• assess algorithm performance in double-blind trials completed by different algorithms and/or humans to test for bias and accuracy • identify and interpret the significance of patterns noted in results, and tailor algorithm as needed
EVALUATION	• ensure the algorithm remains fit-for-purpose for the need it is trying to address and the questions it is trying to answer, to avoid any divergence

Conclusion

> really this is the start of a longer conversation – we will continue to explore these issues and how to address them as we learn more over time

> humans and machines need to work together to achieve the best possible benefits in an ethically appropriate way, to ensure we temper computer weaknesses with human strengths

> remember, algorithms should only ever be an input to a decision – they shouldn't make the decision for you. The level of safeguards you put in place may vary due to the value and complexity of the decision being made, and the period over which the algorithm has been used

Thank you!

> thank you for your time – I hope you now have a better understanding of how algorithms work, and are better equipped when coming across them as an evaluator, program manager or service owner in the future

> if you'd like to keep the conversation going, come and have a chat at the break, or find me at our exhibitor booth

> full contact details are overleaf, but feel free to drop me a note at kristyhornby@grosvenorpg.com.au / give me a buzz on 03 9616 2700 if you have more you'd like to discuss

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