Topical Digest

Artificial Intelligence

AARON McMURRAY & TREVOR GORDON
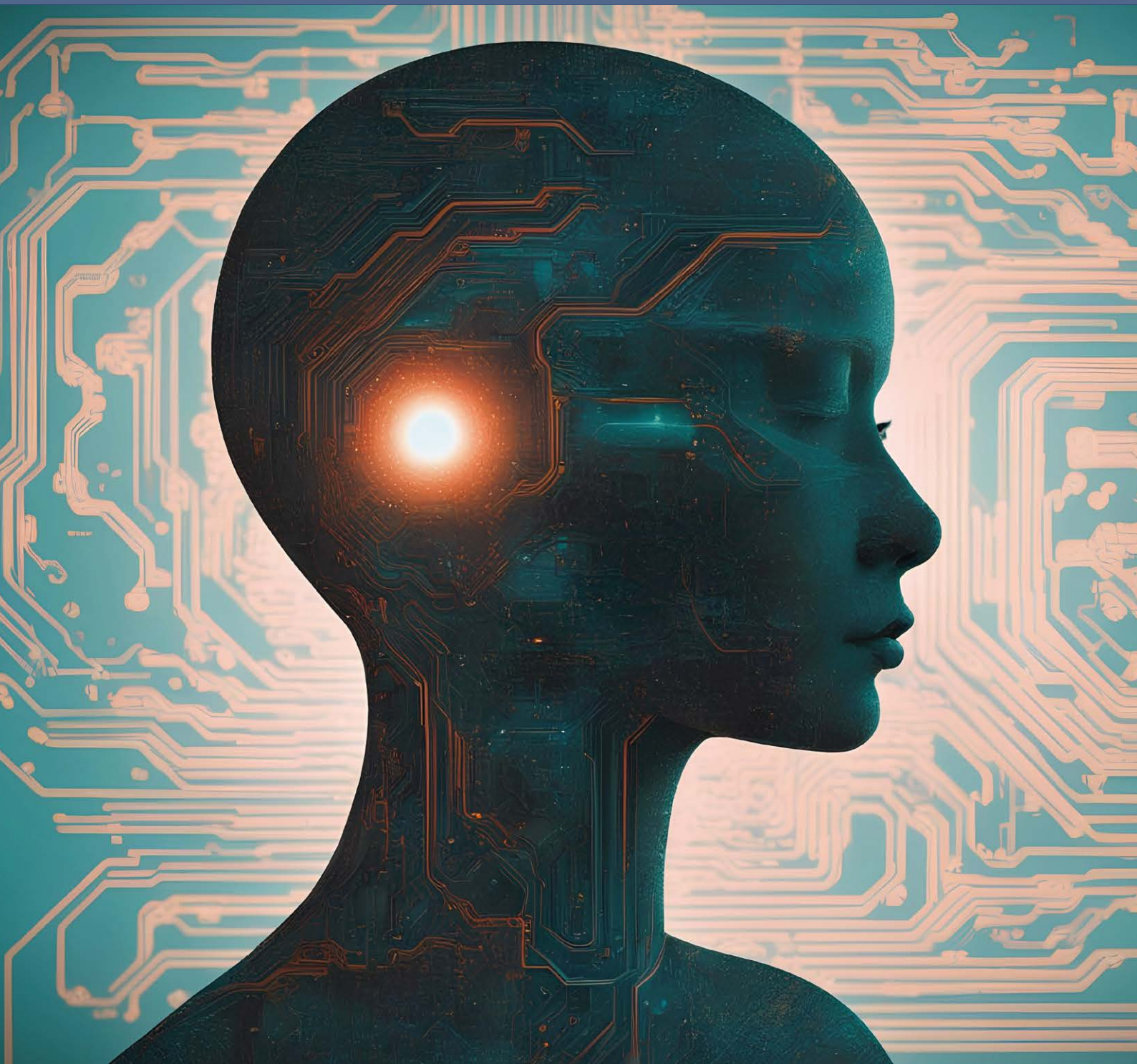
Research &
Information
Service

Northern Ireland
Assembly

Northern Ireland
Assembly

Topical Digest
Artificial Intelligence

20 September 2023

This Topical Digest provides a reading list on the emerging Artificial Intelligence (AI) landscape in Northern Ireland and the UK. In what seems like a remarkably short time span, AI has been woven into the fabric of our lives. It permeates diverse sectors from healthcare and finance to transportation and entertainment. This digest brings together a snapshot of some of the most recent publications and articles on AI, including background publications to inform readers of the long history of AI, a UK Government white paper, committee reports, industry insights and research papers.

Should MLAs or their constituency staff require any assistance in accessing the material listed in this digest they can contact the Library via the enquiry desk, or by email or telephone: library@niassembly.gov.uk | 028 90 521250.

Front cover image: Generated using Stable Diffusion XL, Stability AI with prompts written by Aaron McMurray, RaISe.

Introduction

This Topical Digest provides a reading list on the emerging Artificial Intelligence (AI) landscape in Northern Ireland and the UK. In what seems like a remarkably short time span, AI has been woven into the fabric of our lives. It permeates diverse sectors from healthcare and finance to transportation and entertainment.

The regulatory landscape has primarily been defined by the UK National AI Strategy, as well as a policy paper produced by the Department for Science, Innovation and Technology and the Office for Artificial Intelligence, entitled 'A pro-innovation approach to AI regulation'. These documents suggest a different approach to that being taken by the European Union (EU), where an outright ban is being sought for certain high-risk applications of AI.

Article 22 of the General Data Protection Regulation (GDPR) outlines the right of an individual not to be subject to decisions based solely on automated processing. Data subjects also have the right to understand the reasons behind decisions made about them by automated processing and the right to object to profiling. These rights could be challenged by AI and it remains to be seen how the interplay between innovation and protecting privacy rights will play out. The regulatory burden with respect to privacy and digital rights may largely be taken on by the Information Commissioner's Office (ICO) due to its remit in upholding information rights in the public interest and promoting data privacy for individuals.

The use of AI could provide wide-ranging opportunities for the public sector, but commentators point to the need for extensive upskilling to understand AI, developing data science capabilities, and identifying opportunities for automation and areas where machine-learning can be applied. Organisations will also need to establish their own AI governance frameworks based on the legislative and regulatory landscape.

Key documents

The UK Science and Technology Framework sets out the UK Government's strategic vision. It sets forth a vision of pursuing and achieving a strategic advantage in science and technology and identifies five key technologies as critical, including AI, engineering biology, future telecommunications, semiconductors and quantum technologies.

The National AI Strategy outlines a strategy to support the transition to an AI-enabled economy and ensure that the UK 'gets the governance of AI technologies right'.

A pro-innovation approach to regulation details the current regulatory environment and sets forth a vision for a flexible 'innovative and iterative' approach that focuses on 'regulating the use – not the technology'.

The Artificial Intelligence Act details the EU's approach to AI regulation; this is essentially a broad legislative approach that bans a range of high-risk applications of AI, including government-run social scoring of the type used in China. This is a markedly different approach to the 'pro-innovation' approach of the UK.

Understanding AI

- A Turing, '[Computing machinery and intelligence](#)', *Mind* (1950) Vol. 39, pp433-460
- A L Samuel, '[Some studies in Machine Learning using the game of checkers](#)', *IBM Journal of Research and Development* (1959) Vol. 3, pp210-229
- R C Schank, [What is AI anyway?](#) *AI Magazine* (1987) Vol. 8(4), p59
- G E Hinton, S Osindero and Teh Y H, '[A fast learning algorithm for Deep Belief Nets](#)', *Neural Computation* (2006) Vol. 18(7), pp1527-1554
- L Hardesty, '[*Explained: Neural Networks*](#)' *MIT News Office* (2017)

UK Government

- Department for Science, Innovation and Technology, [*The Governance of Artificial Intelligence: Interim Report*](#) (2023)

UK Parliament

- House of Lords Artificial Intelligence Committee, [*AI in the UK: Ready, Willing Able? Summary of Conclusions and Recommendations*](#) (2022)
- House of Lords Justice and Home Affairs Committee, [*AI Technology and the Justice System: Lords Committee Report*](#) (2022)
- House of Lords AI in Weapon Systems Committee, [*How Should Autonomous Weapons Be Developed, Used and Regulated?*](#) (2023)
- House of Commons Library, [*Data Protection and Digital Information (No. 2) Bill*](#) (2023)
- [*Data Protection and Digital Information (No. 2) Bill*](#) (2023)

Department for the Economy (Northern Ireland)

- Department for the Economy, [*AI Advancements Explained, and the Perspectives of Industry and Government*](#) (2023)

European Parliament/Commission

- European Commission, [*A European Strategy for Artificial Intelligence*](#) (2021)
- European Parliament, [*AI Act: A Step Closer to the First Rules on Artificial Intelligence*](#) (2023)

Industry insights

- IBM, *What is a Neural Network?* (2021)
- IBM, *What are Convolutional Neural Networks?* (2023)
- Microsoft Learn, *Deep Learning vs. Machine Learning in Azure Machine Learning* (2023)

Research papers

- C Rudin, '*Stop explaining black box Machine Learning Models for high stakes decisions and use interpretable models instead*', *Nature Machine Intelligence* (2019) Vol. 1, pp206-215

- Y K Dwivedi, et al. '*So what if ChatGPT wrote it? Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy*', *International Journal of Information Management* (2023) Vol. 71

- G Franceschelli and M Musolesi, *On the Creativity of Large Language Models* (2023)

- K Kheiri and H Karimi, *SentimentGPT: Exploiting GPT for Advanced Sentiment Analysis and its Departure from Current Machine Learning* (2023)

- Li S W, et all, '*ChatGPT outscored human candidates in a virtual objective structured clinical examination in obstetrics and gynecology*', *American Journal of Obstetrics & Gynecology* (2023) Vol. 229:172, pp1-12

- OpenAI, *GPT-4 Technical Report* (2023)

Selection of media and other articles

- *'UK competition regulator proposes guiding principles to make AI market safe'*, *Belfast Telegraph*, 18 September 2023

- '*ChatGPT could come back to Italy by end of April*', *Politico*, 15 September 2023

- *'ChatGPT: Everything you need to know about OpenAI's GPT-4 tool'*, *BBC Science Focus*, 1 September 2023

- *'ChatGPT is making up fake Guardian articles. Here's how we're responding'*, *The Guardian*, 6 April 2023

- *'ChatGPT's alter ego, Dan: users jailbreak AI program to get around ethical safeguards'*, *The Guardian*, 8 March 2023

- '*Despite OpenAI's promises, the company's new AI tool produces misinformation more frequently, and more persuasively, than its predecessor*', *NewsGuard*, March 2023

- '*Microsoft's Bing AI made several factual errors in last week's launch demo*', *CNBC*, 14 February 2023

- '*FOI reveals over 12,000 people profiled by flawed Durham police predictive AI tool*'. *Fair Trials*, 15 August 2022

- '*The alarming deceptions at the heart of an astounding new chatbot*', *Slate*, 13 December 2022

Commentary and analysis

- PWC, *The Economic Impact of Artificial Intelligence on the UK Economy* (2017)
- The Royal Society, *Explainable AI: The Basics* (2019)
- Ada Lovelace Institute, *Who Cares What the Public Think?* (2022)
- Competition and Markets Authority, *AI Foundation Models: Initial Report* (2023)
- Goldman Sachs, *The Potentially Large Effects of Artificial Intelligence on Economic Growth* (2023)
- World Economic Forum, *Artificial Intelligence: The European Union's Artificial Intelligence Act – Explained* (2023)
- Rosenblatt Law, *Artificial Intelligence (AI) Just Got Real* (2023)

Information Commissioner's Office

- ICO, *How Do We Ensure Lawfulness in AI?* (2023)
- ICO, *What is the Impact of Article 22 of the UK GDPR on Fairness* (2023)
- ICO, *Information Commissioner's Response to the Data Protection and Digital Information (No 2) Bill (DPDI No 2 Bill)* (2023)

For more information, or to contact the Research and Information Service, please use the following weblink or the QR code below: http://www.niassembly.gov.uk/assembly-business/research-and-information-service-raise/

This information is provided to MLAs in support of their Assembly duties. Whilst we strive to ensure that the information provided here is up-to-date, the information on external websites referred to may change frequently.

Topical digests are compiled with brevity in mind; librarians and researchers from the Research and Information Service select the subject matter of topical digests – and the publications and articles which they contain – on the basis of their relevance to Assembly business but, by their very nature, these digests are not comprehensive.

The Research and Information Service is available to discuss the content of this digest with Members and their staff but not with the general public.

If Members require assistance accessing the content referred to in this digest, or wish to propose topics for further topical digests, please contact the Library Enquiry Desk via the details below. Please use the QR code above to access the full range of RaISe resources.

<u>Assembly Library</u>

Telephone: 028 90 521250

Email: library@niassembly.gov.uk