REF2021

Institution: University of Oxford

Unit of Assessment: 30 - Philosophy

Title of case study: Defining A New Ethics for the Digital Age

Period when the underpinning research was undertaken: September 2013 – July 2020

Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Luciano Floridi	**Role(s) (e.g. job title):** Professor of Philosophy and Ethics of Information; Director of the Digital Ethics Lab	**Period(s) employed by submitting HEI:** 02 Sept 2013 - present
Period when the claimed impact occurred: 2017 – December 2020		

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact (indicative maximum 100 words)

The fast-evolving field of artificial intelligence (AI) raises serious ethical questions. As one of the foremost experts in the ethics of AI, Professor Floridi's theoretical and applied research has resulted in changed ethical AI policies for international actors including Microsoft and Ernst & Young. It has also contributed to guidelines for analysing and resolving ethical problems concerning personal data and AI in collaboration with the Alan Turing Institute, Digital Catapult, the House of Lords, the House of Commons, the Information Commissioner's Office in the UK, the European Commission, and the Vatican.

2. Underpinning research (indicative maximum 500 words)

The information revolution is changing the world profoundly, irreversibly, at a breath-taking pace, and with an unprecedented scope. Floridi has spearheaded a number of advances in the Philosophy of Information. Specifically, he has demonstrated the need to rethink the way we conceptualize our individual reality, what it means to be human in the digital age, how philosophy needs to approach the information age, and what ethical analyses can do to adapt.

In his book The Fourth Revolution - How the Infosphere is Reshaping Human Reality, Floridi shows that recent technologies have blurred the lines between online and offline worlds [1]. This has changed the answer to the fundamental question of who we are and how we relate to each other more than previous technological advances. In addition to coining new words and expressions that have become widely adopted such as "infosphere", "fourth revolution", "inforg", and "conceptual design", his work demonstrated that the creation, management, and utilisation of online platforms, data, and algorithms vital issues.

In his book The Logic of Information, Floridi has proposed a new way of philosophising to address the changed information-driven world in which we live [2]. His starting point is that reality provides the data which constrains affordances. We then transform these into information, like semantic engines. Such transformation or repurposing is not equivalent to portraying, or picturing, or photographing, or photocopying anything. It is more like cooking: the dish does not represent the ingredients, it uses them to make something else out of them, yet the reality of the dish and its properties hugely depend on the reality and the properties of the ingredients. A corollary is that models are not representations understood as pictures, but interpretations understood as data elaborations, of systems. In brief, Floridi articulates and defends the thesis that knowledge is design and philosophy is the ultimate form of conceptual design. In many ways, Floridi's proposal is a break from traditions based on Aristotelian metaphysics or the 'linguistic turn' and affirms the central role of conceptual clarification and refinement in philosophy.

Floridi has also illustrated a number of ways in which our outpaced understanding of the infosphere's nature and consequences demands that we change the way we analyse them ethically. His contributions in this area include a number of influential publications in the growing field of digital ethics [3-6]. Digital ethics is the branch of ethics that studies and evaluates moral problems related to data (including generation, recording, curation, processing, dissemination, sharing and use), algorithms (including artificial intelligence, artificial agents, machine learning and robots) and corresponding practices (including responsible innovation, programming, hacking and professional codes), in order to formulate and support morally good solutions (e.g. right conducts or right values). The ethical challenges with which it deals can be mapped within the conceptual space delineated by three axes of research: the ethics of data, the ethics of algorithms, and the ethics of practices. His views on ethics were summarized in his 2018 paper "AI4People—An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations." In the paper, he and the co-authors note the need to apply traditional ethical principles, and propose an additional one: explicability, understood as (i) explainability of AI for the expert and (ii) transparency of AI for the non-expert [3].

In other publications, Floridi has argued that AI can be a great force for good, [4] provided that it is properly regulated [5], and especially if ethical considerations are built into the design of new technologies [6].

3. References to the research (indicative maximum of six references)

1. [Authored Book, available on request] Floridi, L. *The Fourth Revolution - How the Infosphere is Reshaping Human Reality* Oxford: Oxford University Press, 2014. ISBN: 9780199606726.
2. [Authored Book, listed in REF2] Floridi, L. *The Logic of Information: A Theory of Philosophy as Conceptual Design* Oxford: Oxford University Press, 2019. ISBN: 9780192570260.
3. [Journal Article] Floridi, L., Cowls, J., Beltrametti, M. et al. AI4People—An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations. *Minds & Machines* 28, pp 689–707 (2018). DOI: 10.1007/s11023-018-9482-5
4. [Journal Article] Taddeo M., Floridi, L. How AI can be a force for good. *Science* 361(6404) pp. 751-752. (2018) DOI: 10.1126/science.aat5991
5. [Journal Article] Floridi, L. Soft ethics, the governance of the digital and the General Data Protection Regulation. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 376(2133) (2018). DOI:10.1098/rsta.2018.0081
6. [Journal Article] Floridi, L. Tolerant Paternalism: Pro-ethical Design as a Resolution of the Dilemma of Toleration. *Science and Engineering Ethics* 22(6), pp 1669-1688 (2016). DOI:10.1007/s11948-015-9733-2

4. Details of the impact (indicative maximum 750 words)

Floridi's research on the need to address novel ethical problems thrown up by digital technologies has contributed to the way in which organizations (government and business) should anticipate and cope with the rapid changes in the field of technology. Specifically, his work on the philosophy and ethics of information has "influenced the influencers", that is, the way in which important actors (such as the European Commission and companies such as Microsoft) deal with digital challenges.

Influencing government policy regarding socially responsible Artificial Intelligence

As Chair of the project "AI4People", the first project on socially good AI in Europe (funded by the Atomium think tank and established in June 2017), Floridi led the first, comparative analysis of international standards and principles about an ethical framework for AI. The research [3] identified 47 different principles and synthesized them into five. Four were very

close to standard bioethics principles and a new one was added regarding explicability (requiring that the issues be explained in a way that relevant stakeholders understand). The work then recommended 20 practical policies to the European Commission [A]. The guidance has influenced policy in the UK, for example by changing the thinking of Members of Parliament and policy documents that government in the UK and EU use to audit AI technologies [B]. Lord Clement-Jones of the House of Lords, for example, affirms that Floridi's work has "had a major impact on the wider government, business, and academic community" [B].

Translating government policy into action in the fight against COVID-19 and beyond

Floridi is a founding board member of the UK Centre for Data Ethics and Innovation (CDEI). This Centre was established in 2018 to provide the UK Government with access to independent, impartial and expert advice on the ethical and innovative deployment of data and artificial intelligence. Floridi has provided key insights to their methodology, including by providing their definition of 'data ethics' [C, p.2]. This methodology informs all their work and Floridi has been an active member of all the meetings where a number of changes have been introduced. An interim report on progress notes that the Centre has worked: (i) with the Home Office to reduce bias [D, p.11]; (ii) with the Behavioural Insights Team to research public perceptions of the fairness of credit ratings and improve financial decision-making [D, p.14]; and (iii) with govern-mental recruitment where they are developing bias-mitigating approaches [D, p.15]. Floridi also set up an AI Ethics committee for Digital Catapult in 2018 [E]. The Chair of the CDEI noted that Floridi has also played a role in ensuring that technologies used to combat COVID-19 are ethical:

> I would also like to mention his work during the COVID-19 pandemic to help ensure that the UK's use of digital technologies in combating the disease is subject to ethical challenge and debate. [F]

Specifically Floridi has influenced the ethics of technologies being used in the COVID-19 era serving in 2020 on the ethics advisory board for NHSX during the development of the NHS contact tracing app [G]. In written evidence to the UK Parliament, it was minuted that:

> The creation by NHSX of an Ethics Advisory Board, chaired by the previous head of the Nuffield Council on Bioethics Professor Sir Jonathan Montgomery to provide advice and recommendations to the app oversight board is welcomed. Having leading experts such as Professor Luciano Floridi, … is very positive. This is a great example of collaboration between the NHSX and the CDEI. [H, p. 5]

Floridi has also influenced the Vatican's official position on the ethics of high-tech research. President of the Vatican's 'Pontificia Academia Pro Vita', stated "thanks to [Floridi's] influential contribution about ethics in hi-tech research, the Academy published an international statement on AI Ethics [known as] Rome Call." The statement supports an ethical approach to AI and is designed to promote a sense of responsibility among organisations, governments and institutions. Signed by The Pontifical Academy for Life, Microsoft, IBM, FAO and the Italian Government, the President of the Pontifical Academy goes on to state, "…the importance of Prof. Floridi's support is that this document was approved and signed by the FAO General Director [and] by the President of Microsoft… on February 28th, 2020 and it was officially delivered to the Holy Father Pope Francis." [I]

Shaping corporate responsibility in AI design and innovation

Floridi has helped some of the most important organisations in the digital industry, advising them about corporate responsibility in the design, development and deployment of AI systems. For example, the Senior Director of European Government Affairs, Rule of Law and Responsible Tech at Microsoft, stated:

It would not be an overstatement to say that Professor Floridi's research, projects and work have tremendously contributed to our own thinking. [J]

Floridi wrote the foreword to Microsoft's vision for the future of technology and AI, published in 2018. [K] Floridi has also influenced the way Ernst and Young evaluate critical ethical challenges posed by AI by being a member of a panel which "establishes governance and controls necessary for building and maintaining trust in AI systems". [L]

With the aim of making his contributions to the ethics of AI and other technologies sustainable into the future, Floridi recently co-founding of the Institute of Artificial Intelligence, whose aim is to help corporations and governments develop ethical regulations surrounding AI [M]. The Institute is new and is already gaining traction. For example, Darren Jones MP, who is a founding member of the Institute, joined legislators from across the world in Paris in February 2020 to take part in the inaugural meeting of the Global Parliamentary Network working group on Artificial Intelligence, which was hosted by the Institute [M, p.5].

5. Sources to corroborate the impact (indicative maximum of 10 references)

A. Selected pages from European Union Ethics Guidelines for Trustworthy AI, 2019 (see pages 11,12 for references to Floridi: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=60419

B. Letter from Lord Tim Clement-Jones, former Chair of The House of Lords, Artificial Intelligence Committee, 27 September 2020.

C. Selection of information from UK Government Centre for Data Ethics and Innovation website, listing Floridi as a Board Member and showing that he provided their definition of data ethics. URLs provided.

D. UK Government Centre for Data Ethics Innovation interim report (Accessed 23 November 2020). https://www.gov.uk/government/publications/interim-reports-from-the-centre-for-data-ethics-and-innovation/interim-report-review-into-bias-in-algorithmic-decision-making

E. Digital Catapult establishes Ethics Committee 9 July 2018 https://www.digicatapult.org.uk/news-and-insights/press/digital-catapult-establishes-ethics-committee

F. Letter the Chair of the Centre for Data Ethics and Innovation, 14 January 2021, confirming Floridi's role in establishing the Centre's ethical policies and downstream UK policies including those surrounding digital technologies being used to combat COVID-19.

G. Blog detailing CDEI response to COVID-19, including Floridi's service on the Ethics Advisory Board providing independent advice and recommendations to the app oversight board. https://cdei.blog.gov.uk/2020/04/27/how-is-the-cdei-supporting-the-response-to-covid-19/

H. Transcript of written evidence submitted by techUK to the UK Parliament about the importance of Floridi's work ensuring that the tracing app was ethical, May 2020. https://committees.parliament.uk/writtenevidence/5360/html/

I. Letter from Vatican noting Floridi's influence on the Vatican's AI policies, 29 September 2020.

J. Letter from Senior Director, Rule of Law and Responsible Tech, European Government Affairs at Microsoft, noting Floridi's influence on their corporation's AI policies, 20 October 2020.

K. Selected pages from Microsoft Vision Document regarding the future of AI in their corporation (December 2018), with foreword written by Floridi.

L. Ernst & Young's press release regarding policy on ethical AI listing Floridi as board member, 24 September 2019. Available at: https://www.ey.com/en_gl/news/2019/09/ey-comes-together-with-coalition-to-help-establish-ethical-artificial-intelligence-systems

M. Institute of AI website (2020), and evidence of MP involvement https://instituteofai.org/about/#team