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Charting a Faceted Categorization of AI and Ethics

Abstract or Résumé:

This paper presents a study of growing trends reflected by publications and published statements on the multifaceted topic of Ethical Artificial Intelligence in library and information science, evidenced in the literature and in the Scopus multidisciplinary database.

1. Introduction

In recent years, numerous researchers have called for the standardization of ethical design (Bryson & Winfield, 2017). A prevalent example is The Institute of Electrical and Electronics Engineers (IEEE) ethically aligned design (Shahriari, K., & Shahriari, M., 2017) that provides a vision and a set of guidelines to prioritize human well-being within artificial intelligence (AI) and autonomous systems usage, and personal data and individual access control. Well-known private corporations such as Google, Facebook, Axon, Amazon, IBM, and Microsoft have launched AI ethics boards while they, in addition to AI ethics research institutes at Harvard, Stanford, and MIT, face backlash for the lack of diversity in their composition (Levin, 2019). In our field, the International Federation of Library Associations and Institutions' (IFLA) Governing Board has recently agreed upon the *IFLA Statement on Libraries and Artificial Intelligence* (IFLA, 2020)*,* and jointly, the Association for Information Science and Technology (ASIS&T), the Association for Library and Information Science Education (ALISE), and the iSchools consortium released a *Statement on AI ethics and the contributions of diverse voices in the discussion* (ALISE, 2020). AI related initiatives are appearing here, there and everywhere, some more performative than others. In November 2021, the *Recommendation on The Ethics of Artificial Intelligence*, offering inaugural guidelines on the development and use of AI, was adopted by UNESCO's General Conference, following "a two-year process to elaborate this first global standard-setting instrument on the ethics of artificial intelligence in the form of a Recommendation**,** following the decision of its General Conference at its 40th session in November 2019" (UNESCO, 2021). It rests on the work of UNESCO's World Commission on the Ethics of Scientific Knowledge and Technology and its critical insight "no global instrument" was covering "all the fields that guide the development and application of AI in a human-centred approach" (UNESCO, 2021).

UNESCO's flagging of the vast range of fields exploring AI as a challenge is a compelling concern for an interdisciplinary community such as ours, wherein for example, in October 2021, ASIS&T held its inaugural AI workshop, surfacing potential for a new library and information science (LIS) focused competency in AI, and wherein, in December 2021, IFLA held a special virtual session under its IT Section to garner support for the creation of an AI special interest group (SIG). Unsurprisingly, IFLA's *Trend Report 2021 Update* addresses AI in two of its top trends: "data domination" and "search transformed" (IFLA, 2022) and its IT Section is holding an AI themed satellite meeting to the World Library and Information Conference in July 2022. As Canadian LIS scholars, we have been tuned into these events, related discourses and dialogues, and serve as fellow witnesses to and advocates for a growing awareness of a need to advance scholarship, education and practice reflective of the prolific contributions to a topic that has captured the attention of the global academic enterprise, the information professions, and intercultural society: ethical AI (Huang, Samek, Shiri, 2021).

2. Objective

Our objective is to share a fresh examination and historically informed analysis of the recent and ubiquitous rise in ethical AI, as well as to offer insights curated for evolving interests in CAIS and sister Canadian-based LIS communities. Through this dual endeavour, our hope is to support the advancement of both open task intercultural projects and of localized ones. We take inspiration from AI for Libraries, Archives and Museums (AI4LAM), an international movement that fosters local chapters. This approach allows for different scales and scopes for AI and ethics and its fast-growing facets and related facets, such as critical AI, AI knowledge, explainable AI, AI servitude, unsupervised methods, and intelligent learning.

3. Methods

Our study adopts a number of complementary methods, including: an environmental scan of AI statements by various prevalent library and information associations and institutions; content analysis of literature on AI and ethics; deep scanning of AI and ethics evident in the Scopus multidisciplinary database in order to examine the development of literature and publications on AI and ethics over time; and, a thematic analysis of topics on AI and ethics, all in order to develop a faceted categorization of ethical AI. By academic training, we turned to the international and multidisciplinary resource, the Scopus database, to perform specific searches on AI and ethics. This revealed an astounding 300% increase in the number of publications in this area, from 1,508 in 2019 to 5,169 in 2022. The Scopus interdisciplinary database was used to conduct searches on AI and ethics on April 13, 2022. The Scopus database allows for searches to be carried out on a number of metadata elements, including titles, abstracts, author keywords, and index keywords. The search delimiters allow for a broadcast search across these textual metadata elements. This kind of search retrieves all the keywords in the following fields: title, abstract, author keywords, and index keywords. The search statement 'artificial intelligence OR AI AND ethics OR ethical' retrieved 5,169. Our actual search strategy can be seen in the following:

(TITLE-ABS-KEY (*"artificial intelligence"*) OR TITLE-ABS-KEY (*ai*) AND TITLE-ABS-KEY (*ethics*) OR TITLE-ABS-KEY (*ethical*))

Table 1. Scopus searches

Searches conducted in Scopus	No. of records 2019	No. of records 2022
artificial intelligence OR AI AND ethics OR ethical	1,508	5,169

Since the Scopus database allows only 2,000 records to be downloaded at a time, we had to select and download three sets of records to ensure that we downloaded the complete retrieved set.

4. Some Key Findings and Observations

Our CAIS 2022 contribution employs our catch of a big writing wave on AI and ethics, as sourced on Scopus, to inform new and emergent LIS education in Canada and beyond. We see this as viable for several reasons. Canada ranks fourth in the world in terms of the number of publications on AI and ethics, following the US, UK, and Germany. In relation to the increasingly multidisciplinary nature of AI and ethics discourse, only 25.1% of the publications appear in computer science literature, with over 24% in the social sciences and humanities literature, and the rest in several other disciplines. And in a topic and trend study of AI and ethics, the number of published documents peaked at 330 in 2018 with *data* and *information* among the key concepts in the discussion of AI and ethics. The data here suggests the scholarship on AI and ethics is closely linked to the established fields of data ethics, computer ethics and information ethics. Many of the data and information ethics related themes and topics (privacy, confidentiality, trust, and moral principles and ethical concerns) have frequently appeared in the AI literature and continue to hold their traction in light of the new and emerging realities of data markets, cybersecurity, data governance, legal frameworks for AI, and the need for trustworthy AI systems - areas given consideration in the April 2021 *Communication on Fostering a European Approach to Artificial Intelligence* (European Commission, 2021).

The notable rapid growth of literature on AI and ethics, from governmental and intergovernmental to non-governmental bodies, civil society organizations, academia and the media is significant for the CAIS community. Because it reveals vast scholarship reflective of emerging, complex, sensitive, and multifaceted implications for research and development and educational purposes, including the evolving LIS curriculum and new and emergent approaches to related teaching and learning, as well as concern for fair and equitable access to it. Particularly as UNESCO cautions "AI plays a role in billions of people's lives. Sometimes unnoticed but often with profound consequences, it transforms our societies and challenges what it means to be

human" (UNESCO, 2021). Powerfully, the need for "international and national policies and regulatory frameworks to ensure that these emerging technologies benefit humanity as a whole" (UNESCO, 2021) supports questioning for what information ethicist and philosopher Rafael Capurro terms "the possibilities for good life with and without artificial intelligences" and how it is taken up by "universities research institutions, scientific associations, government and the media" (Capurro, 2019).

Based on our research, we propose two key arguments: First, data and information are the foundational constructs in any discussion of ethical AI. LIS has a long history of research into: information organization, analysis and processing; information retrieval; information interaction, cognition, and search behaviour; library and information ethics; and, the fundamental concept of relevance. The LIS domain has developed a solid knowledge base for understanding data and information and how humans interact with them. It is interesting to note how the current literature on ethical AI is surfacing the importance of what LIS has already been researching for over 50 years, namely the ethical treatment of information and data and how data and information are created, processed, understood, retrieved, interacted with, and acted upon. Secondly, ideal and informed discussions of AI will necessarily draw upon both the well-established areas of information ethics and library ethics, and closely examine and conceptualize the key ethical principles and values that have been developed over several decades. This will benefit both productive and constructive contributions to the development of a framework for understanding, teaching and learning data-focused and information-focused ethical AI.

5. Select Concrete Contributions

Preliminary analysis of our findings suggests our work can help a global audience to identify almost universally important facets of AI and ethics for LIS education and scholarship (e.g., algorithmic literacy, algorithmic transparency; environmental education; access to education; automated intellectual freedom; information justice, data justice; data intelligence; fundamental rights and safety risks). And from this foundation, we are poised to also offer a curated set of special areas of interest to the Canadian-based CAIS community (e.g., access to data in Canada; diversity of cultural expressions through linguistic diversity in Canada; Canadian legislation, lawful AI and AI regulation in Canada; decolonial AI, Canada's generation AI).

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