Review of: "Collaborative Intelligence: A scoping review of current applications"

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This review article about applications of collaborative intelligence is relevant and timely. I really enjoyed reading it: the article is well written and I think it represents a significant scientific contribution. However, I have a major critique, which is related to the search for applications that in my view is not comprehensive enough to account for different subfields of AI.

Abstract

"In most applications the AI had a virtual presence but there were examples where the AI also had a cyber-physical form"

It might be worth using a clearer language especially in the abstract: my understanding is the two cases differ in terms of algorithms running on the cloud (still the machines are somewhere, a physical space, although they are not owned by who runs the AI project) or on premise. However I think, by looking at the values of the variable "interface" in table 1, what you mean is if it's a physical robot or a GUI. This only becomes clearer in the section "collaboration channels".

In general, these dichotomies could be made more clear and accessible for a generalist audience.

Introduction

Nice introduction to the scope of the article, but some key details are missing.

In particular, the definition of AI is given for granted. Please define what is meant by AI in this study, already in the introduction: e.g. is it machine learning, robotics or knowledge representation? Any of those? This point has relevant implications for the methods applied.

The opening line uses some buzzwords, e.g. "internet of things" or "big data", without defining them, but I understand that doing that would sacrifice a very catchy opening.

Methodology

In my opinion the key words to capture artificial intelligence applications are too limited; on the contrary the effort to capture the human collaborative side was evident (by adding several options).

Machine learning (ML) is not, as stated in pag. 4, a synonym of AI, although unfortunately it is often misused in common parlance. ML is actually a subfield of AI: my reference for this is "Artificial Intelligence: A Modern Approach" (2003) by Stuart Russell and Peter Norvi, but it's well established in the literature.

AI encompasses various subfields, including machine learning, but also knowledge representation (e. g. use of semantics and ontologies) and reasoning, natural language processing, computer vision, and robotics, among others.

By searching only for ML or AI, all the applications of AI related to, for example, knowledge representation and reasoning (e.g. semantic web technologies) might be overlooked.

I suggest to include in the search keywords related to different subfields of AI, and in particular knowledge representation and reasoning, which are not likely to appear when searching for "artificial intelligence". E.g. I found the ARIES project, in which I personally work, by searching "human intelligence" + "semantic web" in Scholar (or human intelligence machine reasoning semantics). Now, it might be that this particular project is not eligible according to the selected criteria, but this is just an example to highlight that you might have excluded all AI projects related to knowledge representation. In fact, I cannot find one example of this subfield of AI making it to Table 1. Not one reference in the whole article on the use of ontologies nor reasoning, for example, which is an AI field building on human intelligence by definition.

The criteria section (and the subsection "literature review") could be merged with the methodology (no need for a specific section and the structure of subtitles is a bit confusing).

The 3 eligibility requirements are repeated from the introduction. I'd simply refer to the 3 criteria of the introduction or move from introduction to methodology.

Table 1. I suggest to add a column specifying the subfield of AI used in those applications. By subfields I mean those cited above:, eg. (ML), robotics, NLP, Knowledge representation, computer vision (CV), etc. At present it looks like the selected applications belong mostly to robotics (6), NLP (4) and computer vision (4). As ML is implied in many of them it might be used in combination when needed such as Diao et al. 2021 (CV + ML).

This improvement has the advantage of giving the opportunity to discuss which subfields are more represented and thus more advanced towards collaborative intelligence; assuming the representation is not the result of a bias in the search.

Table 1, Column 1 "type" is not very informative: the categories used there should be defined before it, e.g. "what is a creative agent"?

When reviewing the applications after table 1 it would be informative to describe briefly how they meet the 3 criteria for collaborative AI.

Discussion

Just for curiosity, but given the immense hype it's inevitable: what makes chat bots (e.g. chatGPT and the like) not eligible as Collaborative AI. I assume because of criteria 2 "shared objective", but it would be nice if you could elaborate on that and explain further.

Maybe some reference to the debate on this type of AI and the key role that collaborative intelligence can play in the future would make the discussion more enticing.

Final comment

Overall, the article as it is now is already interesting and useful, but the suggested changes might make the results more credible and the key messages clearer. I think the hype and confusion around AI in these days require a very clear way of referring to it, at least in scientific articles. Then, the concept of Collaborative Intelligence is extremely powerful and can shed some light on a more human-centric use of AI, which is a key issue for the scientific community and beyond.