

SIPP Assignment – CSC1016S, 2022

Write an essay on ethical issues with Digital Assistants

1. Introduction

Digital Assistants (DA) as software and hardware tools are not new, but they are growing up from the hand-held PDAs of yesteryear that let you schedule appointments to slick-looking ‘intelligent’ devices and interfaces—also called ‘intelligent personal assistants’—that the user can have a conversation with, finds answers for you, and execute tasks. Their main characteristic features are that they produce unscripted output and attempt to answer any question and complete certain tasks. They may be realised as voice assistants from a device, as chatbots with typically written text, or virtual agents that are presented to the user as an avatar. They are designed to look fun, playful, and harmless to interact with. Yet, a range of issues is being raised nonetheless, from privacy invasion in the home to reinforcing gender stereotyping, to answer bias. Culturally appropriate behaviour of digital assistants is only being looked into—but far from resolved—in the past few years.

2. Assignment

You are tasked with writing an essay that will answer the question: Should DAs remain unregulated by law, wherever that may lead to? Your argument in the answer to this main question must be *rational* and *reasoned*. You may read any of the sources on the Web, but you must give proper credit to whichever sources you use. Several relevant sources are listed further below, which include both popular news articles on issues, as entry-level exploration, and some technical references. If you wish, you may also refer to your own use of a digital assistant, such as Cortana on Windows 10, Siri on Apple, Google Assistant, or the Amazon Alexa, but of course this is not necessary. You also may want to bring in a moral theory you subscribe to so as to strengthen your argument, if it is relevant to the argument. As computer science students, you should bring to bear your expertise in computing.

You may pick any one ethical subtopic of a DA. Some examples are as follows:

- Physical DAs can easily be equipped also with additional features, such as being a smoke detector and be linked up to the music player. *Should the DA act autonomously upon input?* For instance, to start the fire alarm and snitch on a dagga-smoking family member, to regulate the volume of the music to its own liking when it recognises that song is played often, and whatever other decision that is not a pre-coded rule but may be based on typical collective user behaviour in such situations or based on software agent negotiations. Conversely: should it only passively respond on the user’s instructions, but not make any decisions of its own?
- Digital assistants mostly have female names and voices nowadays. It is argued that this exacerbates gender stereotyping, being that of subservient, slaving, women at the service of gadget owners and the software developers who are predominantly male. Is this problematic? Are the design choices simply reflecting preference of the presumed majority of users? If so, is it always good to tailor the computer-human interaction configuration to the expected majority of users? *Should gender, or any other demographic feature, be a factor in human-computer interaction design of a DA?*
- Is it ethical to store everything that the user says to the digital assistant, for an indeterminate amount of time, and that the company can do with the voice recordings what they want? Would such recordings be acceptable as evidence in a criminal investigation? Should it be allowed to eavesdrop on conversations so that it can

respond proactively on requests and ‘understand’ better the context of a request and provide better service? Is a feature for learning the user’s daily routine good to build into the DA? Put differently: *where are the privacy boundaries for a DA, if any?*

- The DA tries to answer general questions, but there are concerns as to where it get its answers from and which sites it uses to complete its tasks. The DA may favour its own products, or may promote higher-paying advertisers more. Unlike a webpage with multiple hits to indicate topical answers, ads, and related topics, the DA will have only one answer. This is clearly open to abuse by corporate interests. *Should this be regulated, considering that DAs are treated like companions rather than the profit-making entities they are?* If so, why; if not: why not? Should users be informed that they may not be offered the best deal and accept that limitation upon using the DA?

3. Instructions

Look at the marking guide below. Do not lose marks by failing to adhere to acceptable standards! The UCT Writing Centre (<http://www.writingcentre.uct.ac.za/>) provides (free of charge) help with writing, should you have difficulties. You may also find some useful guides on their website; click on the tab labelled “Improve Your Writing”.

- Please write in a readable fashion in a tone appropriate for an academic document.
- You may certainly use an active voice and the first person if you wish.
- Your success will depend on a developed, rational argument.
- The paper should be well structured and you should marshal arguments and evidence.
- Draw conclusions based on evidence.
- Use the Harvard/APA or ACM/IEEE referencing style (e.g., <http://library.queensu.ca/book/export/html/5846>).
- Several text processing software applications, such as OpenOffice and MS Word, have built-in spelling and grammar checkers, which generally are useful.

Maximum Length: 2000 words

Format: PDF, 12pt serif (e.g., Times New Roman), A4 paper, 2.5 cm margins, 1 or 1.5 line spacing.

Submit your paper via the Assignments tool on Vula. Do *not* submit to the Automatic Marker as this is not a program. **Do not zip the file, it must be a pdf file.**

4. Marking Guide

These are the categories for marks. Although they largely reflect the logical structure of your paper you do not have to have exactly this structure as long as the points are covered. It will not be easy to get marks in the last section (number 7 in the table below). If your arguments

are superficial you will get zero here. Higher marks will be gained for reflective and strategic arguments.

1.	Language, style & overall presentation (appropriate for an academic paper)	15
2.	Introduction and motivation	10
3.	Presentation of evidence, factual accuracy, relevance	20
4.	Critical analysis, logical soundness of the arguments	20
5.	Conclusion and Recommendations	15
6.	Suitable referencing	5
7.	Originality, significance, innovative ideas, depth of ideas	15
	<i>Total Marks</i>	<i>100</i>

5. FAQ

Is this assignment (the essay) compulsory?

No. No CSC1016S assignment is compulsory; they all contribute to your DP and final result for the course.

Does the essay really have to be 2000 words long?

No. 2000 words is the very maximum. If you can make your argument in fewer words, that's fine. It's the substance that counts; see also the marking guide.

If I write it, which question should I answer/discuss?

There are sample questions in the assignment description, a few more will be mentioned in the papers listed. Pick one in an area that sounds most interesting to you.

Must I say something about a moral theory and Digital Assistants?

You may, but do not have to do so (see assignment instructions).

Can I get an extension on this assignment ?

No. The end of semester has some very tight deadlines due to manual marking constraints. There is an option of late submissions, with the usual penalty policy.

6. A few pointers to scientific literature and news articles

This list is intended to help you get started in your literature search and provide a few informal introductions to some of the issues raised with DAs. They were selected because they cover different topics from different perspectives, are from widely diverse sources, and use different keyword terms. You are not expected to read them all.

Borgo, S., Blanzier, E. Trait-based Culture and its Organization: Developing a Culture Enabler for Artificial Agents. *IEEE/RSJ International Conference on Intelligent Robots and Systems 2018 (IROS'18)*, 1-5 Oct 2018, Madrid, Spain. IEEE Xplore, 333-338.

- Budzinski, O., Noskova, V. Zhang, X. The brave new world of Digital Personal Assistants: benefits and challenges from an economic perspective. *Ilmenau Economics Discussion Papers*, Vol. 24, no 11, 31p. December 2018. https://www.db-thueringen.de/servlets/MCRFileNodeServlet/dbt_derivate_00043900/Diskussionspapier_Nr_118.pdf
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- Li, H., Milani, S., Krishnamoorthy, V., Lewis, M. Sycara, K. Perceptions of Domestic Robots' Normative Behavior Across Cultures. *ACM Conference on Artificial Intelligence, Ethics, and Society 2019*, Hawaii, USA. http://www.aies-conference.com/wp-content/papers/main/AIES-19_paper_232.pdf
- Liao, B., Slavkovik, M., van der Torre, L. Building Jiminy Cricket: An Architecture for Moral Agreements Among Stakeholders. *ACM Conference on Artificial Intelligence, Ethics, and Society 2019*, Hawaii, USA. Preprint: arXiv:1812.04741v2, 7 March 2019.
- Sarikaya, R. The technology behind personal digital assistants: an overview of the system architecture and key components. *IEEE Signal Processing Magazine*, 2017, 34(1): 67-81.
- Sciuto, A., Saini, A., Forlizzi, J., Hong, J.I. "Hey Alexa, What's up?": Studies of in-home conversational agent usage. *Designing Interactive Systems conference 2018 (DIS'18)*, Hong Kong, China, June 09 - 13, 2018. ACM, 857-868.
- Sondergaard, M.L., Hansen, L.K. Intimate futures: staying with the trouble of digital personal assistants through design fiction. *Designing Interactive Systems conference 2018 (DIS'18)*, Hong Kong, China, June 09 - 13, 2018. ACM, 869-880.
- Stoffels, S., Stroud, S.R. Google Assistant and the ethics of AI—case study: the ethics of artificial intelligence in human interaction. *Media Ethics Initiative, Moody College of Communication, University of Texas, USA*, 24 September 2018. Online: <https://mediaethicsinitiative.org/2018/09/24/google-assistant-and-the-ethics-of-ai/> (last accessed: 6-6-2019).
- Stucke, M.E., Ezrachi, A., How Digital Assistants Can Harm Our Economy, Privacy, and Democracy. *Berkeley Technology Law Journal*, 2018, 32(3):1239-1299.
- Swain, F. AIs could debate whether a smart assistant should snitch on you. *New Scientist*, 22 February 2019. Online: <https://www.newscientist.com/article/2194613-ais-could-debate-whether-a-smart-assistant-should-snitch-on-you/> (last accessed: 27 May 2019).
- UNESCO. *I'd blush if I could: closing gender divides in digital skills through education*. White paper, 2019. 145p. Online: <https://unesdoc.unesco.org/ark:/48223/pf0000367416.page=1> (last accessed: 27 May 2019)
- Wakefield, J. Female-voice AI reinforces bias, says UN report. *BBC News*, 21 May 2019. Online: <https://www.bbc.com/news/technology-48349102> (last accessed: 27 May 2019)
- Woods, H. Do I want an always-on digital assistant listening in all the time? *The Conversation*, 16 July 2018. Online: <https://theconversation.com/do-i-want-an-always-on-digital-assistant-listening-in-all-the-time-92571> (last accessed: 6-6-2019)