

STOR 390: HOMEWORK 1

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Abstract: We have now seen three ethical theories as well as their pitfalls. We have also thoroughly discussed their applications to the justifiability of Chat GPT. Now it is your turn to demonstrate your own understanding and mastery of these philosophical concepts.

1 Is the use of Chat-GPT justifiable in academic settings?

To what extent, or under what circumstances, is the use of Chat-GPT justifiable in academic settings? Use (at least) one of the above principles as a supporting argument for your position. Argue for your position in one page or less.

Chat-GPT, or any generative artificial intelligence (AI), can be a great tool for advancing one's own learning and research capabilities. These AI systems provide immediate access to a vast repository of information scraping the World Wide Web, generate diverse, creative ideas, and simulate intellectual discourse, all of which are invaluable in an academic context. In my own experience, utilizing Chat-GPT for comprehensive literature searches on complex topics like undergraduate mental health, depression, and melancholy proved to be remarkably effective. This effectiveness was not only recognized at the University of North Carolina at Chapel Hill but also garnered international recognition and award at the University of Oxford when presenting our final research project. One of the biggest topics of discussion during our judging at each stage of the systems-based research competition was the strength and breadth evident in our literature search and, human, review process. However, this is not an argument to say that AI can be used in substitute to traditional learning tools.

From a consequentialist standpoint, the justification for using Chat-GPT in academia hinges on the outcomes it produces. If the use of AI leads to enhanced learning experiences, more thorough research, and a broader understanding of subjects, then its application is not only justifiable but recommended. The ability of AI to process and synthesize information at a scale unattainable by humans alone can, objectively, lead to significant advance-

ments in knowledge and understanding. In complex fields like Statistics and Analytics or Biology and Medicine, AI can quickly analyze vast datasets, providing insights that might take much longer to discern through manual analysis. Further, AI can be used to enhance past experiments that lacked access to the modern technology we now possess in the modern age. An example of this was presented in *Origins* [Brown, 2017] related to Miller and Urey's experiments [Miller, 1953] on recreating the "primordial soup." Although the subject of this book was science fiction, the idea was not so far fetched to have an AI work on better recreating the early earth conditions and to combine this with technological simulation across centuries or longer rather than a few months as was used in the original paper written by Miller and Urey.

Virtue ethics, originated by philosophers such as Aristotle, focuses on the inherent character of a person rather than on specific actions. This ethical theory suggests that behavioral ethics stem from the virtues ingrained in the individual. Virtue ethics prompts us to consider how the use of Chat GPT in academia aligns with the virtues or moral character we seek to foster both in educators and in students. One of the key virtues in academic settings is the pursuit of knowledge and wisdom. Chat-GPT, as an advanced data collection and analysis tool, aligns well with this virtue. It can serve as an aid in the relentless quest for knowledge, providing students and researchers with quick access to a wide range of information and diverse perspectives. This tool can enhance one's capacity for critical thinking and understanding, as it offers insights and data that might originally be inaccessible or difficult to comprehend to the reader. In this way, Chat-GPT can be seen as an extension of one's intellectual virtues, facilitating a deeper engagement with learning materials and promoting intellectual growth. Furthermore, the virtue of curiosity is inherently linked to academic endeavors.

Chat-GPT can also serve as a catalyst for curiosity, opening up new avenues of inquiry and exploration through new innovations such as symbolic AI. By providing diverse viewpoints and covering a broad range of topics, it can inspire users to delve deeper into subjects, ask more profound questions, and explore areas they might not have considered otherwise. One example of this was demonstrated in a recently published paper on abstract reasoning in a classical problem involving the Raven's Progressive matrices (RPM) test, as demonstrated in Figure 2.

This previously was an extremely tough problem for neural networks alone. However, the method used by Hersche and his collaborators was 88% accurate on a set of problems compared to neural networks alone being only 61% accurate on the same set. Also significant, the approach used by this team was 250 times faster than using the traditional method of symbolic logic which involves referencing an immense rulebook to make decisions. Clearly, AI can lead those who are curious to pursue harder problems in unique, innovative ways.

In conclusion, from the perspective of consequentialism and virtue ethics, the use of Chat-GPT in academia can be justified when it aligns with and supports the expansion and pursuit of knowledge and curiosity. AI has become not just a tool for information retrieval and analysis, but also a means of enriching the educational experience and contributing to the moral development of those engaged in scholarly pursuits.

2 Counterargument

In no more than half a page, consider and refute a potential objection to the position you staked out in the above question.

While consequentialism focuses on outcomes, it also acknowledges that negative consequences must be weighed and mitigated. The potential for academic dishonesty, over-reliance on AI, and the erosion of critical thinking skills are valid concerns that must be addressed. Ensuring that AI is used as a complement to, rather than a replacement for, traditional academic methods is essential in preserving the integrity of the educational process. Moreover, the nearly unlimited access to data mentioned in the previous argument can lead to a poor foundation in approaching research questions or learning in general. As Richard Feynman put it, "There is no learning without having to pose a question. And a question requires doubt." While generative AI can be great for answering quick questions, it can often become a crutch to those who tend to overuse for answering most or even every question that pops into

their head. This leads to a weak foundation in reasoning and argumentative abilities—essential for academia in all facets from students to teachers to researchers. Even more worrying, the element of untruthfulness and lack of integrity can lead those who lack these abilities to "plagiarize" these new agents of information. Although the prompts are often originally written and queried by the author, it is the generative AI doing the bulk of workload related to critical thinking and reasoning. Many times, this results in weaker, general arguments that lack the nuances and creativity capable by the supposed human author. This worsening of knowledge and abilities clearly undermines the previously stated benefits of generative AI like advancing one's own learning and research capabilities. Moreover, it's difficult to fully understand the true outcome of generative AI used in academia until additional research is done in the field of developmental psychology to study how youth's approach towards learning changes in response to the AI revolution.

In conclusion, the potential for academic dishonesty, over-reliance on AI, and the erosion of critical thinking skills are potential gaps in the originally posited argument. Additional research should be done before any outcome can be argued from a consequentialist perspective.

3 Appendix

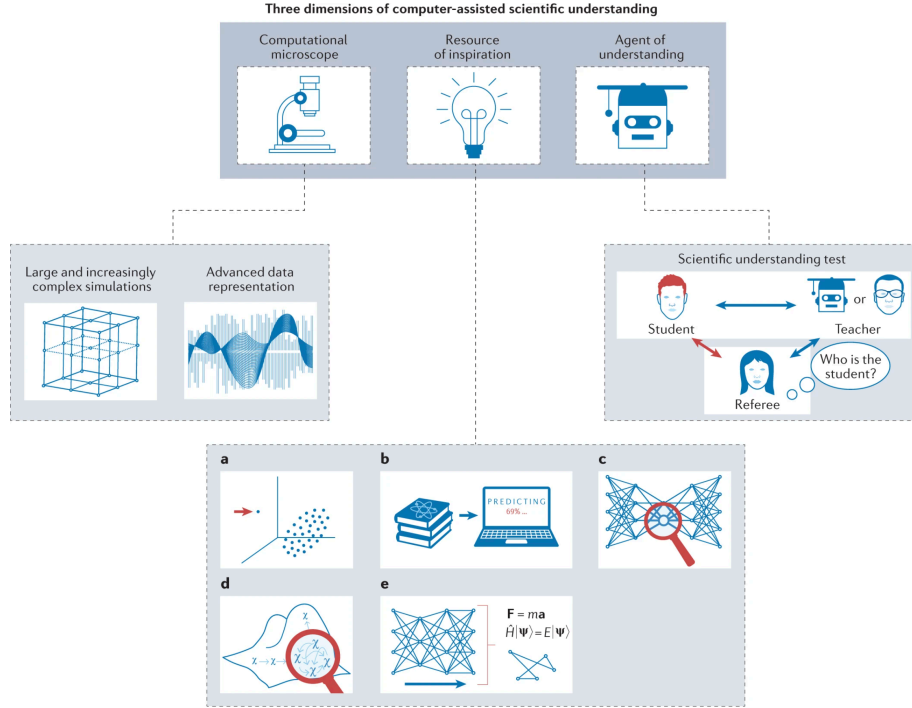


Figure 1: “The current state-of-the-art computational microscopes could be developed further with more complex systems, which could be simulated thanks to advances in algorithms and hardware, and with more advanced data representations (left-hand panel). As resources of inspiration, computational systems can help the human scientist by identifying surprises in data (a), identifying surprises in the scientific literature (b), finding surprising concepts by inspecting models (c), probing the behaviour of artificial agents (d) or by extracting new concepts from interpretable solutions (e). The scientific understanding test discussed in the main text is illustrated in the right-hand panel.” [Krenn et al., 2022]



Figure 2: “The RPM is a non-verbal test which involves perceiving pattern continuation, element abstraction, and finding relations between abstract elements based on underlying rules. Each RPM test is an analogy problem presented as a 3×3 pictorial matrix of context panels. Every panel in the matrix is filled with several geometric objects based on a certain rule, except the last panel which is left blank. The participants are asked to complete the missing panel in the matrix by picking the correct answer from a set of candidate answer panels that matches the implicit rule” [Hersche et al., 2023]

References in the Discussion

- [Brown, 2017] Brown, D. (2017). *Origin*. Doubleday, New York.
- [Hersche et al., 2023] Hersche, M., Zeqiri, M., Benini, L., et al. (2023). A neuro-vector-symbolic architecture for solving raven’s progressive matrices. *Nat Mach Intell*, 5:363–375.
- [Krenn et al., 2022] Krenn, M., Pollice, R., Guo, S., et al. (2022). On scientific understanding with artificial intelligence. *Nat Rev Phys*, 4:761–769.
- [Miller, 1953] Miller, S. L. (1953). A Production of Amino Acids Under Possible Primitive Earth Conditions. *Science*, 117(3046):528–529.