Article

Locating the Ethics of ChatGPT—Ethical Issues as Affordances in AI Ecosystems

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Abstract: ChatGPT is a high-profile technology that has inspired broad discussions about its capabilities and likely consequences. There has been much debate concerning ethical issues that it raises which are typically described as potentially harmful (or beneficial) consequences of ChatGPT. Concerns relating to issues such as privacy, biases, infringements of intellectual property, or discrimination are widely discussed. The article pursues the question of where these issues originate and where they are located. This article suggests that these ethical issues of the technology are located in the technology's affordances. Affordances are part of the relationship between user and technology. Going beyond existing research on affordances and ChatGPT, the article suggests that affordances are not confined to the relationship between humans and technology. A proper understanding of affordances needs to consider the role of the socio-technical ecosystem within which these relationships unfold. The article concludes by explaining the implications of this position for research and practice.

Keywords: ChatGPT; ethics; affordance; AI ecosystems; conceptual analysis; ethics of technology

1. Introduction

ChatGPT in its various versions is probably the most widely discussed digital technology and most prominent chat bot at the time of writing this article. It is hailed as a disruptive technology that will upend existing business models and usher in new ways of working and interacting. Sam Altman, the CEO of OpenAI, the company behind Chat-GPT, suggests that it has the potential to break capitalism [1]. The disruptive potential of ChatGPT and related technologies based on large language models can be described in glowing and optimistic terms as well as dark and pessimistic ones. ChatGPT raises numerous ethical concerns. The debate of the ethical issues surrounding ChatGPT started with concerns about its impact on students and the integrity of examinations but has since evolved to cover many more and much broader issues including privacy concerns, equality of opportunity to access and benefit from it, and various malicious uses from political manipulation to suppression of free speech. While ChatGPT is widely used, it is probably less widely trusted, not least because of the broader concerns it raises.

This brief overview suggests that ChatGPT, like any other technology, can be used by different users for different purposes with a range of outcomes. Some of these will be deemed to be desirable, others less so, and the exact evaluation will often be contested. ChatGPT is thus not intrinsically good, nor is it intrinsically bad. It can be either and maybe also both simultaneously. The public discourse surrounding it nevertheless often tends to portray it as predominantly one or the other. This article moves beyond the questions

raised by specific ethical issues and aims to identify the location of the characteristics that render a particular technology, such as ChatGPT, ethically problematic or beneficial. The article's objective in finding a response to the research question is to clarify the basis of claims of ChatGPT being good or bad and thereby enrich the ethics and policy discourse to move beyond the temptation of seeing the technology in one specific light or its opposite without engaging with the way in which context and environment drive such perceptions.

I attempt to answer the research question by introducing the concept of affordance. Affordances form part of the relationship between user and artefact. Focusing on this relationship helps overcome the false dichotomy that it is either the user and their intention that renders an artefact good or bad, or that ethical qualities are intrinsic to the technology. I argue that this use of the concept of affordances is still not sufficient to locate the ethical characteristics of ChatGPT. Affordances, as well as their ethical evaluation, do not exist in a vacuum but are enacted and only make sense in the social, political, economic, technical environment in which they are realised. Understanding the ethical side of ChatGPT therefore requires an appreciation of the broader (AI) ecosystem. This argument is not unique to ChatGPT, but the current high-profile discussion of this particular technology lends itself to explore the question in more detail.

The article employs the methodology of conceptual analysis and argument [2,3], which is widely used in the humanities and typically less visible but arguably as important in the natural sciences. It incorporates aspects of a narrative review [4], but it focuses on the logic and relationship of core concepts underpinning the discussion of ChatGPT, its ethical implications, and the way these are constructed and perceived.

The article is relevant to several audiences. The immediate audience is the group of scholars who are interested in the ethics of IT [5,6] and its socio-technical embedding [7]. For this audience, the combination of the discussion of ethical issues and their link to the concept of affordances should prove to be of interest. The application to a high-profile current example of a technology will serve to ensure broad reception of the argument. However, the article should furthermore prove to be of interest more broadly to readers who are involved in questions of the practical use and regulation of ChatGPT and other emerging technologies. It provides input into further discussions, such as those related to trustworthiness of and trust in technologies [8–10]. This is a topic of high interest on the international level, with governments and international bodies working on developing reliable and sustainable approaches to regulation which balance the need for freedom to innovate with the protection of users and consumers.

This article is structured as follows. It begins with a quick overview of ChatGPT and large language models more broadly which is followed by a discussion of ethical aspects associated with this type of technology. It then proceeds to the concept of affordances which provides the basis for the discussion of ethical issues as affordances of ChatGPT. I argue that these affordances are the location of the characteristics that render ChatGPT ethically problematic or beneficial. However, understanding them properly requires an appreciation of their role in the broader AI ecosystem that is discussed in the subsequent section. This leads to a discussion of the theoretical and practical implications of the framing of ethics as affordances.

2. ChatGPT and Its Ethical Implications

While most readers will know what ChatGPT is and may have used it, it is nevertheless useful to provide a brief introduction to the current state of the technology. This is required to understand why it raises specific concerns which, in turn, are the basis for the perception of ethical aspects of the technology.

2.1. Current State of ChatGPT

ChatGPT is a is an internet-accessible chat bot powered by an underlying large language model, currently GPT3 or GPT4. These technologies were developed and are owned by the US company OpenAI. First released to the public on 30 November 2022 [11], Chat-GPT has taken the internet by storm. This is somewhat surprising, given that the idea of chat bots goes back to the 1970s, probably most prominently developed and discussed by Weizenbaum [12] in the context of his ELIZA chat bot. Attempts to integrate chat bots into existing technologies, for example, in the form of the infamous Clippy user interface that was integrated into Microsoft Office or later in the form of the high-profile failure of Microsoft's Tay chat bot [13]. The phenomenal success of ChatGPT in terms of user uptake and media attention begs the question of how it differs from its predecessors to allow it to be this successful.

Chat bots were conceived as technologies that could autonomously communicate with human beings. One likely reason why they have not been very successful in the past is thus their limitations when interacting with humans. They were typically designed for specific purposes, such as Clippy's purpose of providing support with MS Office applications. This rendered them potentially useful in situations where their capabilities were required, but irrelevant outside of these contexts. One key feature of ChatGPT is that it is based on Generative Pretrained Transformer technology, which is a large language model. GPT3 and its successors are AI tools that are trained on huge amounts of data using unsupervised learning algorithms [14]. This allows them to statistically predict likely responses to text input.

While the underlying ideas, algorithms, and technologies are all established, ChatGPT appears to have crossed a previously invisible threshold. It stands to reason that this development was facilitated by the underlying models driving ChatGPT and the capability of the software and hardware infrastructure that host those models. For the purposes of this article, it is less important to understand the exact technical details of ChatGPT. It is more important to understand key characteristics that these technical underpinnings engender in the technology, as these are at the core of the ethical concerns raised by ChatGPT and link to the question of affordances. Without claiming to be comprehensive in the analysis, I believe that the following are among the key characteristics that contribute to its success and may also be key to its ethically problematic side. The first characteristic is that ChatGPT can produce text in response to human input that is of such high quality that it is often difficult to identify as the output of an AI [15]. A second characteristic of ChatGPT is the instantiation of a large language model in a chat bot is its ability to engage in a dialogical interaction on a very broad array of topics [16]. This ability to interact is not uniform across all interactions but can be tailored to specific language styles [17]. While most of the debate concerning ChatGPT focuses on input and output in the form of written text, it can be integrated into other modalities of communication which would, for example, enable it to engage in voice communication [18]. Another important feature is that ChatGPT is not static but has the ability to learn from interaction allowing it to further improve the content quality and acceptability [19]. And, finally, it is worth noting the current limitations, for example, that the large language model that it is built on is trained on large but limited datasets [14].

2.2. Ethics of ChatGPT

Much of the AI ethics discourse focuses on the consequences of AI development and use that are deemed to be bad or wrong. There is broad consensus on what counts as ethical issues. Bias and discrimination, violation of privacy, social disruption, unemployment, and increased likelihood of warfare are all broadly viewed as morally bad and harmful

and can thus count as the ethically problematic side of AI. These aspects of ChatGPT are seen as undesirable in their own right, but they also have negative knock-on effects, such as a reduction in the perceived trustworthiness of the technology [20] which can lead to reduced uptake and thus the weakening of the benefits.

The dominant response to the growing awareness of the morally relevant downsides of AI is to develop guidelines. High-level reviews of these guidelines [21,22] have identified numerous principles such as privacy, accountability, safety and security, transparency and explainability, fairness and non-discrimination which are meant to pre-empt and avoid ethical concerns. In most cases one can find more detailed analyses of how these issues impact practice but, on a general level, the issues are mostly so widely recognised that they do not seem to call for a specific definition or justification.

An understanding of the ethical issues of ChatGPT is crucial for this article and the question whether and to what degree the ethically problematic side of it is intrinsic to the technology. As ChatGPT is still a relatively recent technology, having been released in late 2022, there is a limited albeit rapidly growing amount of peer-reviewed academic literature on the ethics of ChatGPT [23]. However, the public interest in the technology is such that there is a plethora of contributions in the media that cover these issues.

As a chat bot based on a large language model, ChatGPT's main area of application is that of the generation of text in an interactive manner. This can be used for any sort of text but some of the likely uses that first triggered ethical scrutiny were those where the provenance of the text matter as well as the text's truth and veracity. This includes contributions to shared resources such as Wikipedia [24] but most prominently its use in the production of scientific knowledge [25–27]. From the use of ChatGPT in research, it is easy to see a connection to the question of the possibility of authorship by ChatGPT [28–30] and from there to the evaluation of research through the broader scientific system and, in particular, peer review [31]. Close attention has been paid to the question of how ChatGPT may legitimately be used by students, in particular in the production of traditional assessment outputs such as essays [16,32,33]. Going beyond these initial concerns, the broad range of potential uses of the technology has led to the recognition that there is a similarly broad range of concerns linked to it.

Among the issues with potential ethical connotations that are currently discussed, one can find those linked to employment [34], in particular in areas that so far seemed immune from technology-induced job losses, such as programming [11]. Broader societal issues may arise due to the potential to personalise communication to large audiences, which can lead to political manipulation, for example, through disinformation [35] or political lobbying [36] and general questions of the role of powerful AI [37]. Large language models furthermore have a significant environmental footprint [38]. In addition, such models suffer from many of the problems other machine learning applications suffer from, such as the opacity of the model which can then lead to the perpetuation of biases and resulting discrimination. The incorporation of large amount of internet text in the training of these models raises unresolved questions of intellectual property [39]. On the long-term end of the open questions are those that pertain to the way in which ChatGPT challenges our perception of ourselves, our mind, and consciousness. While it is probably uncontentious to say that ChatGPT does not really understand the text it produces in the way that a human author does [40], its outputs are often eerily good and convincing. It has passed initial tests designed to show theory of mind [41]. Based on rigorous scientific testing of its capability, GPT-4 has been described as a significant step in the direction of achieving artificial general intelligence, i.e., intelligence that is comparable with human-level intelligence [42]. This article does not aim to provide a comprehensive overview of the ethics of ChatGPT (for a more comprehensive account see [43]). The preceding paragraphs were meant to indicate

the breadth of ethics-related concerns that have been raised in the discourse, but they do not claim comprehensive coverage of all possible concerns. A more systematic approach to the ethics of ChatGPT has been provided elsewhere [43]. The purpose of this article is not so much a further discussion of these issues, but the question of where these ethical characteristics of ChatGPT are located, as I will now explore in the following section.

2.3. Possible Locations and Justifications of Ethical Characteristics of ChatGPT

Having established that there are ample examples of ethical aspects of ChatGPT, we can now return to the question of where these aspects are located. What is it that renders ChatGPT or specific uses of it ethically problematic or beneficial? One way to pursue this question is to look at how it is answered in philosophical ethics and to explore how ethical judgments can be made. Using the terminology introduced earlier, this moves us from the realm of morality as the distinction between good and bad to the realm of ethical theory, which provides the theoretical underpinnings of moral judgments.

Ethical theory as a core part of the subject area of moral philosophy has developed a rich array of positions that can be used to assess, reflect on and justify moral judgments. Much of the recent discussions of ethics in technology focus on three well-established ethical theories as archetypes of theoretical positions that can exemplify different ways in which we can support moral judgements. The three theories are deontology, teleology or consequentialism, and virtue ethics [44]. It is worth briefly reviewing these three theories here because their different ways of arriving at ethical judgments give indications of the grounds on which ChatGPT or aspects or uses of it would be considered good or bad.

Deontology is the theory of ethical approaches that focus on the duty of the moral agent. It is closely associated with the work of German enlightenment philosopher Immanuel Kant who famously held that the only good thing is good will and will is good if it is motivated by duty [45,46]. Kant offered various versions of the so-called categorical imperative which allows an agent to assess whether the maxim of an action they are considering is ethically acceptable. I will not attempt a philosophical assessment of this deontological position, but it is of interest here because it has a very clear implication for the location of good and bad, which is the individual agent. To return this thought to the discussion of ChatGPT, the ethical evaluation of a use of ChatGPT would solely depend on the intention of the (individual) user of the technology.

While there is a large degree of plausibility to the idea that ethical reflections and judgments need to cover the individual intention, it is important to be aware of alternative conceptualisations of ethics. The most prominent counterpoint to deontological ethics is that of teleological ethics. Where deontology focuses on duty (from Greek '*deont-*' being needed or necessary), highlights the importance of end results (from Greek '*telos*' the end, limit, goal, fulfilment, and completion). The ethical quality of an action according to this position can be determined from the consequences it has (hence this position is also known as 'consequentialism'). Teleological ethics is most prominently represented by utilitarian positions, which derive their name from the use of the concept of utility to measure the outcomes of an action. This approach is closely linked to philosophers like Jeremy Bentham [47] and John Stuart Mill [48].

Again, I will not attempt a philosophical discussion of this position beyond the insight it offers with regard to the location of good or bad. In the case of teleological ethics, the focus is not on the individual intention, nor is it on the nature of the technological artefact but on the consequences of the use of the artefact.

The third ethical position indicated above is that of virtue ethics. Originating in Greek Antiquity and prominently linked to Aristotle's [49] work, virtue ethics locates the basis of an ethical evaluation in the character of the agent. An agent is virtuous if they successfully

navigate between the extremes or the vices and find the golden mean between them. A good example of this is the virtue of courage which requires the agent to find the mean between cowardice and recklessness. From the perspective of this article and the search for the location of ethically relevant characteristics, virtue ethics focuses on the individual agent, even though it uses different criteria from deontology.

This brief overview of some ethical positions could easily be extended with more detail on the ethical theories as well as the addition of further ethical theories, including some of the more recent ethical positions specifically aimed at digital technologies, such as computer ethics [50], information ethics [51] or, more recently, the ethics of AI [52]. However, the point of this brief introduction is to provide examples of ethical positions that allow for an identification of the location of what is perceived to be good or bad. My argument is not that any of these theories are right or wrong. I believe that they all capture integral aspects of how we think about right and wrong and therefore they all have an important role to play in ethical deliberation. There is no overarching ethical theory that governs all others, and it seems likely that such an overarching theory is neither desirable nor achievable. This explains why we continue to have ethical debates and there is no expectation that these will ever be comprehensively resolved.

Despite the irreducible plurality of ethical theories, their brief introduction here serves an important purpose in this article, namely, to point to the difficulties of attempts to identify the location of ethical issues arising from the technology. Returning to ChatGPT, it seems clear that an attempt to place the location of ethically relevant characteristics exclusively in the individual user falls short. Individual intentions, duties, characters, etc., may be subject to ethical evaluation, but the discourse on the ethics of ChatGPT indicates that the capabilities of the technical artefact have a significant influence on broader social perceptions of the moral quality of (the use of the) technology. We can thus safely rule out the focus on the individual. We can similarly rule out a focus purely on the artefact, an option not considered earlier, due to the focus of established ethical theories on (individual) human beings. This combination of agent and artefact is the plausible location of ethically relevant characteristics. However, this position is not clear in how this combination is to be conceptualised. This position seems plausible in that it suggests that ethical qualities depend on both the user and the technology in question. But it still fails to inform us where exactly we can locate the characteristics and qualities that render ChatGPT, or better a use of ChatGPT ethically relevant.

3. Affordances and ChatGPT

One way of thinking about this location of ethical characteristics is to use the concept of affordances. These can be understood as an aspect of the relationship between agent and artefact that drives morally relevant outcomes. I will therefore introduce the concept of affordances now.

3.1. The Theory of Affordances, Its Limitations, and Use in Information Systems

Affordances, a concept introduced by psychologist James J. Gibson [53], refer to the inherent properties or qualities of an object or environment that suggest how it can be used or interacted with. Gibson sees affordances of the environment as facts of the environment, but not facts at the level of physics. Norman [54] describes the approach to affordances as based on the attempt to understand how we manage in a world of many objects, many of which we only ever encounter once. How do we know to interact with an entity that we have never seen before? For Norman the answer is that the appearance of a device provides clues for its proper operation.

An example of an affordance that Gibson uses is that of sitting-on. He suggests that an object that rests on the ground, has a surface, is sufficiently rigid, flat, level, and extended with a surface height of the knee of a human affords sitting-on. A human encountering such an object will recognise the affordance and may choose to sit on the object. Affordances are not confined to human users and also exist for other animals. This points to the fact that affordances are anchored in the object, but they depend on the users. As Gaver puts it, affordances "are properties of the world defined with respect to people's interaction with it" [55]. The affordance of sitting-on, thus, may exist for an adult human being but it might not be available to a child or a dog.

This brings us back to the ontology of affordances. The key question here is whether the affordances are part of the object that they refer to or whether they are perceptions. The answer to this question by the theorists of affordances such as Gibson and Norman is that affordances are relational; they reside in the relationship between the object and the subject, the artefact and the user. That is why Gibson suggests that affordances cut across the dichotomy of subjective versus objective.

More recent research underscores the insight that affordances are relational, depending on both the object and the capabilities of the user. They are not just properties of the object but arise from the relationship between the object and the user [56]. Furthermore, affordances have been recognised as critical in human–computer interaction and design, guiding the creation of intuitive and usable interfaces. Researchers have proposed frameworks to systematically study and apply affordances in empirical research [57].

Part of the attraction of the concept of affordance is probably the open and unpredictable nature of digital artefacts. Moore referred to this as the 'logical malleability' of computing technology [58], a term that he used to highlight the highly uncertain use of digital artefacts. While all eventual uses of technologies are somewhat undetermined and technologies display what has sometimes been called interpretive flexibility [59], this is particularly prominent in digital artefacts which are built as general purpose artefacts. This may explain, to some degree, why the social and organisational uses of digital artefacts are difficult to predict and control. The concept of affordances offers one way of explaining why identical artefacts used by different users in different contexts can lead to vastly different outcomes. This idea aligns with discussions of sociomateriality in information systems [60,61]. One key question in this context is that of the ontological status of affordances. Lanamäki et al. [62] identified four stances on the relationship between user and artefact that are based on different ontological and temporal dimensions. For the purposes of the current article, a strong ontological position is not required. Suffice it to say that affordances are realised in the relationship between user and artefact. This position avoids the problem of having to locate the affordance in either the object or the subject.

This view of affordances offers a useful perspective that helps locate ChatGPT's ethical characteristics. As an initial response to the research question, one could now state that the location of the characteristics that render ChatGPT ethically relevant is the technology's affordances, which form part of the relationship of technology and user and are thus influenced both by the user and their intentions and by the capabilities of the artefact.

However, the simple view of affordances being confined to subject and object misses the important influence that the socio-technical environment plays in shaping the (human) subject and the subject's perception and use of the object and hence their relationship. Put differently, affordances are not just part of the relationship of subject and object, but they can only be perceived, evaluated or assessed within a specific context. The literature has recognised this point which is less crucial for individual affordances in the natural environment (e.g., the affordance of sitting-on) but of prime importance for the understanding of the social use of digital artefacts. Affordances, such as the use of email

require, not only an individual relationship between user and artefact but also need to take into account the social nature of the action that such affordances facilitate. One way of dealing with this is to move away from the artefact as a key focus in exploring affordances and instead concentrating on the social practice that affordances permit [63,64]. In addition, the explanation of social action and social affordances calls for further theoretical support. Fayard and Weeks [63], therefore, introduce Bourdieu's concept of habitus to explain the social nature of afforded practises. A different theoretical position is adopted by Faik et al. [65] who make use of institutional theory to explain how affordances can support social actions.

This question of social agency is an important aspect of the question of ethically relevant aspects of ChatGPT. It is a key reason for the introduction of the idea of AI ecosystems in the following section. However, before I return to this, I will briefly introduce some of the affordances that ChatGPT displays.

3.2. Ethical Affordances of ChatGPT

This article is not the first one to apply the concept of affordances to ChatGPT and other LLMs [66,67]. A Scopus search in November 2024 show that there are approximately 13,500 articles on ChatGPT included in the database which mention the term in their title, abstract or keywords. Of these, 70 make use of or include aspects of affordances. Twenty-five of those 70 articles were published in 2023 and the remaining 45 in 2024.

This literature provides a multifaceted exploration of ChatGPT's integration into education, highlighting both its potential benefits and the challenges that accompany its adoption. A recurring theme across the sources is the examination of ChatGPT's affordances for both educators and students. For instance, Arifin et al. [68] illustrate how students leverage ChatGPT in writing to expand their lexical resources, improve grammatical accuracy and coherence, and facilitate brainstorming and outlining. This research reveals that students perceive ChatGPT as a valuable tool for enhancing their writing quality, particularly in terms of time efficiency and receiving immediate feedback. Similarly, Crompt et al. [69] discuss ChatGPT's capacity to support students in developing their writing skills by identifying and correcting grammatical errors, brainstorming topics, and assisting with various stages of the writing process.

Beyond its writing support capabilities, the sources explore ChatGPT's potential in transforming traditional learning approaches. Daneshvar Kakhki et al. [70] identify affordances such as providing self-directed and personalised learning, facilitating student engagement with real-world issues, and offering personalised assessment mechanisms. This research suggests that ChatGPT can contribute to a more engaging and meaningful learning experience for students, while also preparing them for a technologically driven job market. Cooper and Klymkowsky [71] propose using Retrieval Augmented Generative (RAG) AI systems like ChatGPT to support three-dimensional learning (3DL) by enabling instructors to design more complex tasks, support student reasoning, and evaluate student responses.

However, the literature also acknowledges the challenges and limitations associated with ChatGPT's use in education. In addition to technical challenges, there are ethical considerations surrounding ChatGPT's application in education, for example, when it reinforces power imbalances between users and developers [72]. Kamali et al. [73] highlight the potential negative impact of over-reliance on AI systems on human thinking processes and decision-making abilities, suggesting that it may hinder critical thinking and problem-solving skills.

In summary, this developing body of knowledge paints a picture of ChatGPT as a powerful tool with the potential to have significant impacts, but it strongly focuses on its use

in education. The research underscores the need for further empirical investigations to fully understand ChatGPT's impact on learning and teaching, develop effective pedagogical strategies, and address the ethical considerations associated with its use.

This brief overview of recent literature indicates that this article is not the first one to employ the concept of affordance and explore its relevance for ethical questions [74]. In this article, I want to go beyond this general recognition and pinpoint in more detail what ethical concerns are or, to return to the language used earlier, where ethical characteristics of ChatGPT are located. One way of doing this is to look at them from the perspective of AI ethics. Following Stahl and Eke [43], one can distinguish groups of ethical aspects where ChatGPT can cause harms, such as social justice and rights, individual needs, environmental impacts and culture and identity. Each of these groups has a range of members. The ethical concerns linked to ChatGPT with regard to social justice and rights can then be broken down further into individual aspects such as exclusion of individuals from public discourse through digital divides that are widened by new technology, issues of justice, fairness, and distribution where ChatGPT raises additional concerns about who benefits from technology and who has to pick up the costs. Larger questions of harms to the social fabric and even intergenerational justice problems could form further problematic aspects. Similarly, the category of individual needs is made up of numerous sub-points, such as the possibility that the availability of ChatGPT will replace human interaction and thus contribute to isolation and loneliness. The technology may reduce individual autonomy and can conceivably lead to psychological harm. It may manipulate individuals, exacerbate consent issues, and limit accountability for such issues. ChatGPT is well recognised for having significant environmental impacts and can affect the culture and identity of individuals as well as groups by contributing to discrimination, perpetuating biases, and shaping identities. This list of ethical concerns regarding ChatGPT affordances only insofar as a user is aware of them and they form part of their relationship with ChatGPT and the user's expectations of possible uses. While these expectations will differ from user to user, the technically literate user stipulated in this section will be aware of some of most of these issues. They may not intend to realise these problems, but they understand them as potentials that can be realised when using the technology.

This long list of ethically problematic aspects of ChatGPT can be counterbalanced by ethical benefits. There are some general advantages which include the possibility of engaging and supporting individuals to find a voice who are otherwise disadvantaged for a range of reasons. ChatGPT offers the possibility of designing new services and reducing our workload which can be morally desirable. In addition, many of the individual problematic aspects listed above can conceivably be turned into beneficial aspects. Where the problematic side is the possibility of isolation and loneliness, the counterbalancing beneficial aspect is that ChatGPT may ease loneliness either by directly interacting with individuals or by supporting systems of social coordination. The problematic side of reduced autonomy, resulting from the loss of perceived options of activity, can be counterbalanced by the possibility of increased autonomy, as ChatGPT or related technology allow individuals to act because of better information, the ability to express themselves better or organise themselves.

It is important to underline that not all affordances of ChatGPT are ethically charged. The capabilities of the technology allow users to do many things that defy moral evaluation and its ethical reflection. For example, ChatGPT allows a user to generate poetry as well as programming code. It can serve as a search engine but also comment on the structure and grammar of a text. Where a user is aware of these affordances, there is no obvious way of classifying them as good or bad. A user generating computer code using ChatGPT may do so to cheat at a university assignment which would typically be seen as

ethically problematic, but they can equally generate code to accelerate the development of a humanitarian aid system, which would be evaluated as ethically beneficial.

This brings us back to the relationship between moral facts and ethical reflection that I introduced earlier, and the question of ethical theories used to justify moral judgments. In practice, this question often does not arise where the issue in question is not contentious. The AI ethics debate shows such consensus on many key issues. There is little debate whether bias or discrimination are morally wrong and little doubt that AI devices need to be safe and reliable. This consensus should not hide the open questions that may lurk behind it. To take the example of bias and discrimination, for example, it is worth pointing out that the ability to discriminate in the sense of distinguishing between different entities, is key to the success of AI. AI systems can discriminate between pictures of dogs and cats, a key steppingstone to the success of machine learning systems in recent years. A moral problem arises when such discrimination is linked to protected characteristics such as age, gender, or race which then leads to discriminatory outcomes, e.g., when members of an ethnic group are disadvantaged by AI-supported parole decisions. This type of discrimination is generally considered morally unacceptable to the point where most western societies have passed anti-discrimination legislation to prevent it. While this can thus count as current moral consensus, it is worth remembering that consensus views can and do change.

In addition to changing moral positions, there is the problem of value conflicts. A particular feature or capability of a technology may be open to competing interpretations. A good example of this can be found in the distribution of economic benefits of AI. OpenAI has raised billions of dollars, not least based on the success of ChatGPT, and can use some of this money to further develop the technology. This raises questions about the general principles of economic distribution as Zuboff [75] convincingly argues in her account of surveillance capitalism. Further general questions arise around intellectual property, or the freedom individuals and organisations should have to engage in entrepreneurial activities versus the protection of individual and consumers. This is where ethical questions start to mix with legal ones around responsibility and liability, all of which are currently hotly debated in the area of AI, in general, and ChatGPT in particular.

The upshot of these points is that ethically relevant aspects of a technology raise additional difficulties when one tries to apply the concept of affordances to them. Where the affordance of sitting-on, once established, is likely to be quite stable, the same cannot be assumed for ethically relevant affordances. Some of these may be contested to start out with, as the example of the current debate of the limits of intellectual property rights in the context of generative AI demonstrates. Moreover, moral concerns and their ethical evaluation are subject to change over time. This dynamic nature of the subject matter further complicates the question of their link to the underlying technology. This is another reason why thinking about them in terms of broader ecosystems may be helpful.

Introducing the concept of affordances has, thus, provided a way of locating the basis of moral judgements and thereby of the ethically relevant side of ChatGPT, but this by itself does not determine what exactly counts as a problematic or beneficial feature. In addition, the decontextualised concept of affordances that I have used so far that only focuses on the relationship between user and artefact misses important aspects of how affordances are shaped and perceived which I will address in the next section.

4. Affordances in Responsible AI Ecosystems

The understanding of affordances as residing in the relationship between user and artefact means that any reference to the affordance of a technology must be understood as a shorthand for assumptions about which affordances an average user could reasonably be

expected to perceive with regard to this technology. This is why I specified the assumed user in the previous section. However, even this specification of the user omits a key set of variables that have a strong influence on the affordances that the user can perceive, namely the environment and context within the user and the artefact find themselves.

To clarify this point, let us consider the example of a bicycle. A normal bicycle is recognisable to most of us. It has a saddle to sit on, pedals to rest our feet on, a handlebar to put our hands on, etc. For most humans living in the 21st century, the affordance of locomotion is associated with a bicycle. However, this affordance is not universal. It may not be available to a small child who cannot reach the pedals. More importantly, the affordance is deeply culturally dependent. A perfectly normal stone-age adult would not perceive the affordance because they would never have seen a bicycle and, thus, have no idea of the meaning of the feature of a seat, pedal, and handlebar and how they combine to afford locomotion. This refers to the bicycle itself but also to the broader socio-technical environment that is required for the affordance of locomotion to materialise, notably a network of cyclable paths and roads. Similarly, the affordance of locomotion would not exist for a 21st century individual if they encountered a bicycle in a rainforest or in a swamp where the properties of the bicycle cannot be translated into the affordance of locomotion.

The point I am trying to make is that in considering the affordances of an object one needs to take into account more than the object, the subject, and their relationship. One needs to be aware of how all of these are shaped and influenced by their environment. This is true for human users, but it is also true for the technical artefact, which is never just a piece of decontextualised kit, but always represents a socio-technical system. This observation is the starting point for me to introduce the idea of AI ecosystems.

4.1. Ethics and Affordances in AI Ecosystems

One problem of the concept of affordances in the context of digital technologies is that they point to social action and practice. The individual concept of affordance proposed by Gibson and others cannot easily deal with the organisational and societal use of digital technologies, ranging from email use to the global application to generative AI. Previous attempts to deal with this collective nature of affordances have brought existing social theories to bear on affordances, such as Bourdieu's [76] idea of habitus [63] or institutional theory [65]. In this paper, I suggest the use of the concept of 'ecosystem' to highlight the importance of the broader context and the complex and interlinking influences that shape affordances, by affecting both the materiality of the artefact and the cognition of the individuals and groups that engage with these.

When we use the term 'ecosystem' in the context of AI, then this use of the term is typically the expression of a metaphor. While AI systems are also embedded in biological ecosystems and can have significant impacts on them, e.g., by contributing to climate change, most examples of the use of this terminology do not point at such biological ecosystems. Instead, they use the term to express some of the characteristics that large-scale socio-technical systems display. This use of the term has been developed in detail in the innovation studies literature where there is a detailed debate building on the ecosystem metaphor going back to the 1990s [77,78].

The reason for the development of this discourse and the success of the terminology can be traced back to the "broader trend in organisation and management studies to focus on interorganizational linkages, networks and interdependencies" [79]. By offering a systems perspective, this view can help explain organisational phenomena such as the growth of new market entrants, the dynamics of markets, and the interaction of human and non-human members of such systems. This way of thinking about technologies can help decision makers better understand the context and logic that organisations find themselves

in and, hence, improve their decision-making [80]. The success of the term is not confined to research and scholarly discourse but can also be observed in policy and broader public debates about technology [81].

The ecosystems discourse is not limited to the innovation studies discourse and has relevance to other fields of relevance to ChatGPT, such as that of information systems. Both build on general ideas of systems [82,83] which have inspired the development of digital computing. The information systems field has, furthermore, contributed to the understanding of socio-technical systems [84,85] which includes the way in which these systems affect human activities [86] and how the socio-technical perspective can be used to identify and address ethical concerns [87,88].

The ecosystems metaphor has clearly captured the attention of people working in the AI policy arena. An early example of this is the European Commission's White Paper on AI that prepared the way for the EU AI Act [89]. References to the idea can be found in publications of international bodies such as the OECD [90] or UNESCO [91]. The key reason for the adoption of this metaphor seems to be that it captures the fact that AI forms part of social and socio-technical systems, that there are multiplicities of agents involved and that the overall ecosystem displays the characteristics of non-linearity and unpredictability. The ecosystem metaphor is heavily used in AI policy discourses which justify the use of policy interventions into AI, typically in the form of research or innovation funding and the development (or lack thereof) of AI-specific regulation, regulators, or legislation. Seeing AI as an ecosystem or maybe as a system of ecosystems also has clear implications for the discussion of the ethics of AI. Ecosystems are resistant to simple interventions and the consequences of any interventions can be difficult to predict.

If we accept the point of this section, namely that it makes sense to think about AI in terms of ecosystems, then this raises the question of the location of affordances in AI ecosystems. The general argument around AI ecosystems strongly suggests that the ecosystem's perspective changes the location of agency from the individual to the ecosystem. This does not mean that individuals lose their freedom or agency, but that any ethical evaluation needs to take into account the ecosystem's nature of the socio-technical systems that we call AI. This means that the ways of intervening in such systems that aim to address ethical concerns need careful deliberation [92–95].

A similar point can be made for affordances. The earlier argument that affordances are located in the relationship between user and technology still holds. However, the application of the concept of ecosystems means that users, technical artefacts, and their relationship are all shaped by their surrounding ecosystem and can neither be understood nor evaluated without a detailed understanding of the ecosystem in question.

4.2. Affordances of ChatGPT in AI Ecosystems

I have introduced the ecosystems metaphor in this article to highlight the importance of contextual considerations when looking at the ethically relevant affordances of any technology, but in particular of ChatGPT. It is, therefore, worth thinking in some more detail about what these affordances may be and in which way they are affected by the surrounding AI ecosystem.

Let us start with the key concern about attribution of texts and intellectual property. One of the most widely discussed issues related to ChatGPT is its potential to mask the origin of ideas, notably by allowing students to produce texts and pass these off as their own, even though they only had limited intellectual input into them. This is a type of action that is widely seen as cheating, and this is perceived to be problematic because it may land individuals in positions where their capabilities are not sufficient to deal with the challenges they face. More broadly, it is seen as morally bad and unfair because it disadvantages those

who do not cheat. An initial observation about the socio-technical ecosystem in which this transpires is that it is predicated on individualism, i.e., it accepts that individuals should be evaluated on their merits, that individual expressions are important and thus should be evaluated and that socially relevant decisions on the role of individuals can be made on the basis of such individual achievements. This is no doubt how many aspects of current industrialised societies work, but it should also be clear that alternatives are conceivable. The ethically problematic affordance of ChatGPT to be usable for cheating is, thus, one that materialises because of the embedded assumptions of the larger socio-economic system, notably the way in which it treats teaching, learning, assessment, and social sorting.

Closely related are questions of intellectual property. There are currently high-profile discussions of the property in the data that is used to train ChatGPT and other LLMs. ChatGPT and presumably most other LLMs have been trained on publicly available data scraped from the internet. This may be problematic because the originators or owners of those data may not have consented to such use, even where they chose to make their data available by putting it up on public websites. Furthermore, there are cases where LLMs reproduce texts that seem very similar to individuals' publications which may deprive these individuals of the benefits from their intellectual labour. The point about the ecosystems in which this happens is very similar to the previous one. The affordance of ChatGPT to infringe intellectual property rights hinges on the underlying definition of intellectual property that pervades the broader socio-economic structure in which ChatGPT is deployed. Intellectual property has been a hotly contested topic that has been affected by developments of digital technology for decades [96,97]. ChatGPT has given a new edge to this debate. It is important to understand this background to appreciate how the affordance of ChatGPT is perceived.

This interpretation of the ethically problematic affordances of ChatGPT can easily be extended to cover the long list of possible ethical issues. The two brief examples above point to the broader socio-economic and legal background. Others would include more detail of the technology itself, e.g., when looking at the problem of biases and discrimination, which is also a society-wide issue, but which has led to many specific interventions with regard to AI [98].

These considerations allow for a more general statement concerning the location of the ethically relevant side of ChatGPT. This problematic side (as well as the less-discussed beneficial side) can be described as a set of affordances of ChatGPT. These affordances are neither fully embedded in the technical artefact nor purely a perception or social construction. Instead, they form part of the relationship between user and technology. However, focusing on affordances as the location of ethical concerns fails to grasp the complexity of the situation. The relationship between user and technology cannot be taken for granted. This relationship and the affordances that it contains are not static and independent. They can only be understood as part of the system of socio-technical systems in which it is contained, or, to use the terms developed here, as part of the prevalent AI ecosystem.

The socio-technical, legal, cultural, economic, etc., ecosystem in which ChatGPT's affordances arise structures and guides all aspects of the technology's affordances. The ecosystem strongly influences the technical capabilities. ChatGPT, as based on foundation models, requires the maturity of machine learning algorithms, the availability of large datasets, and computing power. At the same time, the ecosystem within which individuals find themselves influences their ability to perceive, access, and use technologies, but also their views on what is right and wrong and how such judgments can be made. Furthermore, this ecosystem also influences what external observers perceive and how they reflect on their

perception. This article, for example, forms part of the ChatGPT ecosystem, is influenced by the technology, and can have impacts on users and future technology developments.

To put it differently, the ethically relevant sides of ChatGPT are not intrinsically part of the technological artefact but need to be understood as shaped and facilitated by the wider AI ecosystem within which the technology is developed and applied.

This way of seeing the ethical questions of ChatGPT should be of interest to the various research communities that are interested in ChatGPT and the ethics of AI more broadly. At the same time, I think they raise questions of importance to practice, as I will explain in the following discussion of implications.

5. Implications

The extremely high level of attention that is being paid to the ethics of AI, in general, and ChatGPT in particular means that the arguments presented in this paper are likely to carry implications for research on the ethics of AI as well as for the practice of dealing with, managing, regulating, and legislating ChatGPT and related technologies.

5.1. Implications for Research

The research discourse for which this article is most likely to be of relevance is that covering the ethics of ChatGPT which forms part of the broader ethics of AI debate. This is a rapidly growing topic that is addressed from many disciplinary perspectives including those of ethics of technology, science, and technology studies, technology assessment, etc., which touch on numerous broader disciplines ranging from computer science and engineering to legal studies, sociology, and philosophy.

This discourse is highly diverse and covers many aspects including the identification of ethical concerns, descriptions of cases and implications of AI, many different responses and mitigation measures, and various ways of evaluating them. One key challenge that many contributions to this discourse face is the difficulty of establishing links between an instantiation of AI, its ethical and social consequences, and possible ways of intervening of modifying the AI. It is often difficult to determine whether a perceived social consequence of AI use is intrinsically linked to the technology in question or whether it is a more or less arbitrary result of the configuration within which the AI has been deployed.

This article offers a way of thinking about this question by suggesting that AI systems, such as ChatGPT, do indeed have affordances which link particular characteristics to the AI system. At the same time, it shows that these characteristics are not immutable and predictable but form part of the relationship between artefact and user which, in turn, is heavily influenced by the underlying AI ecosystem. From a research perspective, this means that investigations into the ethics of AI are likely to benefit from paying explicit attention to this AI ecosystem or the AI ecosystems that influence the AI in question. AI ecosystems—as systems in general—are at least partly constituted through the process of observation. The researcher will, thus, have to ask what AI ecosystem they want to consider, how they define the boundaries, and what relevance these choices have for the observation of the AI in question. This means that the research will not be made easier, but it is likely to be enriched and will open pathways to exploring links to other variables that may influence the AI's affordances but that not part of the immediate research environment.

This article should also be of interest to researchers who are interested in the ethical aspects of (information) technologies beyond AI. The concept of affordances may help conceptualise the nature of such characteristics. I suspect that the application of the concept of innovation ecosystems may work beyond the AI field as well, so that analogous reasoning with regard to other technologies is likely to bring up similar conclusions. The ecosystems metaphor is heavily used in relation to AI, but the innovation ecosystems discourse shows

that it is broadly applicable across different technology platforms. Questions of ethical or other characteristics of a range of technologies are thus likely to be able to make use of the idea of ecosystem-mediated affordances.

5.2. Implications for Practice

The argument presented here is also likely to be of interest to practitioners who work in the field of AI, notably in areas trying to promote benefits and avoid downsides of AI, such as in areas of AI funding or AI policy. There is a plethora of suggested interventions into AI development and deployment practises. The first wave of these was heavily focused on guidelines [21] but there is now a steadily growing number of tools that support everything from impact assessments [99] to standardisation [100] and professional guidance [101].

The ideas presented here can increase the awareness of the complexity of the relationship between a technology and its consequences. Technologies do not have clearly defined characteristics that will lead to predictable consequences that can be affected by clear-cut interventions. Instead, the interventions will typically form part of the AI ecosystem that drives the relationship between the technology and its users and, thus, shape the affordances of the technology.

To return to our focus technology of ChatGPT, this means that straightforward top-down interventions may not work as intended. To take the example of students cheating on essays by using ChatGPT, decision makers need to be aware of their role in the ecosystem. If we look at the example of a single university issuing policy for the use of ChatGPT to their students, the point to highlight is that this policy itself forms part of the AI ecosystem of the university, which forms part of the larger national and international higher education landscape. A university may decide that the use of ChatGPT constitutes cheating and link it to heavy sanctions. If it does this, it should realise that this framing of the technology use forms part of the ecosystem that shapes the affordances of ChatGPT for both students and staff. The position is, thus, self-reinforcing. The use of ChatGPT then becomes problematic in the case of essay-writing and cheating is emphasised as an ethically problematic affordance of the technology itself. Similarly, a different approach that would see the use of ChatGPT as a means to help students achieve their potential, along with guidance to ensure that students intellectual contributions are highlighted, would contribute to a different ecosystem. In such an alternative ecosystem, the problematic side of ChatGPT as a facilitator of morally undesirable cheating is reduced and replaced by its beneficial side of helping students achieve their aims.

Similar arguments can be made about other ethically relevant affordances of ChatGPT. On a societal level, a key concern is that of employment impacts [102]. A possible framing is that ChatGPT can be used to replace content creators such as journalists but also creators of technical content such as programmers. Policymakers need to understand that the way that they frame the problem forms part of the problem itself. If a heavy emphasis is placed on retaining existing jobs, then ChatGPT can no doubt be said to have the ethically problematic side of leading to job losses. The empirical validity of such framings are difficult to ascertain as the discussion of the net employment impact of various technologies since the introduction of the steam engine has shown [103]. An alternative framing could be that ChatGPT can take the effort out of some aspects of content creation, leaving creators to focus on the more creative aspects and increasing productivity [104]. This would emphasise the beneficial side of support for humans rather than the problematic side of creating unemployment.

The point is, thus, not so much that the stories one can create around ChatGPT are arbitrary but that the people who are working on responses to perceived ethically relevant characteristics of the technology form part of the ecosystem within which it unfolds and,

thus, have an influence on the relationship between users and artefact and hence on the artefact's affordances.

This means that the practice of shaping, regulating, or legislating ChatGPT and AI more broadly should be understood as a recursive activity. Interventions should include mechanisms that allow for the investigation of the expected and unexpected consequences of these interventions. Focusing possible interventions on specific aspects is unlikely to lead to predictable outcomes and, thus, result in success. Instead, when considering the ethically relevant characteristics of ChatGPT, any intervention needs to be informed by the insight that the technology's affordances are shaped by both the capabilities of the artefact and the knowledge and intention of the user, but also by an understanding that both of these are affected by the broader ecosystem.

This calls for tentative governance approaches [105] that are open to experimentation, learning, and reflexivity. This may not be easy in many circumstances but, as this article suggests, it is called for not just for general purposes of democratising technology but also because the very ethically relevant features of ChatGPT and related technologies depend on the ecosystem governance.

6. Conclusions

This article has explored where ethically relevant characteristics of ChatGPT are located. It has introduced the concept of affordances to answer this question and argued that the ethically charged characteristics of ChatGPT can be seen as affordances. These affordances form part of the relationship between user and artefact. By drawing on the metaphor of AI ecosystems, I have argued that this relationship and the affordances it contains should be looked at from the ecosystem perspective. The ethically problematic and beneficial characteristics of ChatGPT are, thus, subject to influences that shape relevant AI ecosystems. This has implications for research as well as practice which call for certain types of ecosystem governance.

The perspective put forward in his article will hopefully enrich both the theoretical discourse and the practice of developing, deploying, and governing ChatGPT. This article used ChatGPT as a prominent example of a current technology, but it is equally applicable to other large language models and probably across much of AI and even beyond this to further technologies.

Accepting the argument of this paper does not make life easier, neither for researchers nor for practitioners. It complexifies the account of ChatGPT and its ethically relevant affordances. It also calls for further research on how AI ecosystems and their influence on technology affordances can best be identified, investigated, and described. One possible way of moving forward could be the application of maturity models to assess levels of stability of affordances, an approach that has been successfully applied to related topics, such as maturity in responsible innovation [106]. This article does not explore specific concerns such as those around privacy and data protection in much detail. Nor does it make claims about whether we could or should trust ChatGPT or even what it would mean to do so. Instead, it offers a more foundational account of how we can locate the characteristics of ChatGPT that lead to ethical considerations and may inform decisions to trust the technology.

The proposed reconceptualization of the location of ethically relevant characteristics of ChatGPT calls for ways to conceptually and empirically show its value. General systems theory and fields like information systems have developed methodologies to investigate socio-technical system. This includes specific approaches, such as the evaluation of ergonomics of human–system interaction as described in ISO 9241-11 [107] but goes beyond much more technically oriented methods and looks at systems holistically [108]. An im-

portant next step is, thus, now to use existing and maybe develop new methodologies and approaches to empirically describe such ecosystems and give evidence-based accounts of how they influence ethically relevant affordances. Such further research would also be required to provide more immediate and actionable guidance to relevant stakeholders, be they developers, policymakers, or other, on how to engage with the complex systems nature of technology affordances.

This article should, thus, be read as an encouragement to take this next step. ChatGPT, as the saying goes, is neither good nor bad, nor is it neutral [109]. Our individual and collective engagement with it drives our relationship and, thus, its characteristics. This engagement can benefit from empirical insights, and we should collect many of these to inform our thinking about it and, thereby, the structure of the AI ecosystems we inhabit. This should help us not only describe the ethically relevant characteristics of technology but strengthen its benefits and mitigate its downsides.

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