

ChatGPT, How Do I Design?

Integrating Modern Generative AI into the Design Process

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Abstract

Modern generative AI has revolutionized human creativity. This paper analyzes the integration of generative AI systems in the design/development processes, focusing on benefits and challenges. I discuss problems such as anthropomorphism, biases, and concerns regarding society, culture, and law, emphasizing the need for a multidisciplinary approach, human oversight, and recognizing AI as a mere tool to ensure ethical AI usage. By examining ChatGPT 4 in storytelling, tabletop games, and Yu-Gi-Oh! deck-building, I posit the most optimal system of integration to be a harmonious co-creation system between the designer and AI. Through an understanding of the advantages, difficulties, and ethical issues of generative AI integration, we can create a future where ethical human-AI co-creation thrives.

1 Introduction

The rapidly evolving landscape of artificial intelligence (AI) has allowed for a new era of human-AI co-creation, particularly in creative industries such as design. In recent years, generative AI systems have shown great promise in revolutionizing the creative process by automating design tasks and enhancing personalization for designers. However, with every advancement in human technology, a new wave of challenges, limitations, and ethical concerns will arise as well. Therefore, this paper aims to provide an analysis of the integration of co-creation between generative AI systems and designers in the creative process, focusing on the potential benefits, obstacles, and broader societal implications of such integration. While AI has undoubtedly made significant strides in content generation and natural language understanding, its application in creative fields has been shaky and filled with concerns. In this paper, I propose the most optimal integration of generative AI into design through a system of harmonious co-creation where designers diligently guide an AI system through the development process. Additionally, I examine different approaches to integrating AI in the creative process, from the collaboration between AI and designers to the use of explainable AI systems, and discuss the

importance of understanding AI's internal workings for harmonious co-creation. In more general terms, many designers view the integration of AI systems to be similar to working with a design partner. On the contrary, I posit that generative AI systems should be viewed as a very intelligent tool that is very limited in its understanding of the “big picture” and exists in an echo chamber of the data it was given in order to recognize its capabilities, limitations, and to avoid anthropomorphism.

This paper also addresses some of the more contentious aspects of utilizing generative AI in creative fields, including the dangers of anthropomorphism, bias in AI systems, and the need for human oversight. I argue that designers should be aware of AI's limitations and treat these systems as tools rather than intelligent agents capable of producing revolutionary works of art. Furthermore, I emphasize the significance of having the relevant knowledge to question AI and recognize its limitations, as well as the need for experienced designers to avoid blindly accepting any AI-generated content. I also delve into the challenges of older AI models and the potential of advanced generative AI technology, such as transformer models, in overcoming these limitations. To better illustrate the challenges and potential solutions in working with generative AI systems, I present several of my own explorations where I tested ChatGPT 4's storytelling capabilities, its use as a Game Master for a tabletop role-playing game, and as a deck-builder for the Yu-Gi-Oh! Trading Card Game. My examinations of the integration of ChatGPT 4 in the creative sphere demonstrate the importance of human oversight and guidance throughout the development process. Moreover, it offers insights into how my proposed system of harmonious co-creation between human designers and AI systems can benefit the designers.

Lastly, I touch upon the broader societal, cultural, and legislative concerns that accompany the use of generative AI systems. These concerns include intellectual property rights, its effects on the human creative process, and the need for policymakers to gain a better understanding of the development, usage, and limitations of generative AI systems to properly legislate around it. I argue that a multidisciplinary effort is required to ensure that generative AI systems are used responsibly and ethically. To ensure all bases are covered, experts in the fields of technology, arts, and policy should be

heavily consulted. In conclusion, this paper offers a comprehensive examination of the integration of my proposed harmonious co-creation between designer and generative AI systems in the creative process. By understanding the potential benefits, challenges, and ethical concerns of this integration, we can build a future where ethically responsible human-AI collaboration in the creative field thrives.

2 Generative AI Systems

Anyone familiar with the design process in any field should agree that utilizing a generative AI to streamline the design process would be a great boon to creativity. Experts, such as Inie et al., hope we “can recognize and celebrate indispensable human properties of creativity and art” (Inie et al., 2023, p. 5). Where this agreement usually ends, however, is on the question of how to integrate generative AI into the design process. On the one hand, Guzdial et al. suggest utilizing AI to fill the historically human role of a design partner in the level design process. In particular, they examined the responses of human designers to an AI with the “personality” of either a Friend, Collaborator, Student, or Manager. Essentially, Guzdial et al. concluded that the AI-driven roles in the level editor have a significant impact on the creative process of game designers, with each role offering distinct advantages and challenges that can enhance or hinder their work and motivation (Guzdial et al., 2019, p. 12). On the other hand, Kruse et al. advocates for utilizing machine learning, AI, and CI (computational intelligence) to help automate the effort-intensive labor aspect of the game design process. Their research maintains that the integration of human input at various stages of the design process ensures that the final game design is aligned with the user's preferences and expectations, while simultaneously harnessing the computational power and efficiency of AI-based systems (Kruse et al., 2022, p. 2). Moreover, Guzdial et al.'s conclusions on the integration of a potentially helpful or destructive AI partner in design is a glimpse into a nearly inevitable future of human-AI collaboration is counter to

the widespread assumption that generative AI would outright replace jobs in the creative field¹. Moreover, Kruse et al. provide a view that the constant integration of human oversight is integral in creating an end product that agrees with the designer's vision. This is a point that needs emphasizing since so many people still believe that interactions with generative AI consist of only providing input and receiving the output.

A huge reason for using generative systems in products is their ability to adapt to the user in ways that the designer would have never considered. Not only does this integration allow users to receive a fully personalized experience, but such an experience is also accessible to people of all backgrounds and abilities. Therefore, we should take a moment to examine how generative, machine learning systems (the precursor to the generative AI systems examined in this paper) are currently being used, as well as how designers currently view said systems. To examine the incorporation of generative systems to maximize accessibility and personalization in video games, Alves et al. crafted “a generative design pipeline for gamepad design based on evolutionary algorithms and machine learning techniques. The evolution algorithm is responsible for creating a large number of gamepad configurations based on the inputs provided by the user” (Alves et al., 2019, p. 247). Already in 2019, we can see generative machine-learning systems being used to reduce work on designers and improve the overall experience for users by offloading the design work for accessibility onto the machine-learning algorithms. Generative AI systems allow designers to tailor their content & products to consumers of all levels of accessibility, all without increasing the workload for themselves. However, despite the numerous reasons for doing so, the world of designers did not incorporate these systems. In 2017, Dove et al. express that the complexity of machine learning systems created a knowledge gap, which was one of the main issues standing in the way of designers who want to utilize them (Dove et al., 2017, p. 3). Designers barely understood what the systems were, much less how they worked or

¹ This paper is a reexamination of the ideas presented in Todd Lubart's “How can computers be partners in the creative process: Classification and commentary on the Special Issue”, with a much stronger focus on the “Computer as colleague”. Gillian Smith (co-author to the paper and one of my professors) took great interest in from Lubart's work is the idea that AI systems are just the next evolution of “rubber duck debugging”. The illusion of “talking” to an AI system which has been anthropomorphized allows for the user to work through their own thought process. Nevertheless, as I later examine in this paper, the act of anthropomorphizing AI systems should be strongly discouraged.

even how to use them. To effectively work with machine learning systems, the knowledge gap must be filled and designers must understand the system's capabilities, limitations, processes, and reasoning.

2.1 Improvements

Almost in response, Zhu et al. addressed the very same issues Dove et al. presented just a year later. Zhu et al. admit that “networked structures of weights with complex topologies and varying transformation functions embedded in them are notoriously difficult to understand by humans” (Zhu et al., 2018, p. 3). Nonetheless, Zhu et al. also describe the current systems that allow human designers to understand an AI's “thought process”, such as the white-box approach (where the AI narrates every action the AI takes and provides context as to why), the black-box approach (where the AI visually or numerically conveys to the designer what patterns are being perceived and every possible extension of that pattern), or a combination of the both. In addition, Zhu et al. posit that these systems must do more than just explain how machine-learning systems execute their functions, but also why. These ideas culminate in Zhu et al.'s proposal for co-creation between AI and designer that is analogous to a dialogue among creators, similar to the ideas presented by Guzdial et al. This “dialogue” is integral for a designer to understand the conditions that lead an AI to execute every action as designers not only consume the content generated by AI but must also work alongside them harmoniously. I mostly agree with such a proposal, believing that a synthesis of the systems of AI implementation discussed, in addition to the generative power of more modern AI, is the best use of AI for designers moving forward.

Nonetheless, it is essential to note the limitations of the AI models and generative systems operated in the previously examined papers compared to modern-day generative AI technology. Jovanović & Campbell report how transformer models, like GPT and BERT, have revolutionized natural language understanding and generation, enabling impressive applications like machine translation, text summarization, and even creative writing (Jovanović & Campbell, 2022, p. 2). In this regard, I agree with Jovanović & Campbell's emphasis on the impressive speed in which this

technology has evolved in terms of advanced level of understanding and generation of natural language because of my own experience with experimenting with ChatGPT 4. In any case, the advent of this new generation of advanced generative AI allows for both more complex and thorough content generation, but also more robust explanations of the internal workings of said AI (via systems explained by Zhu et al). Therefore, it is the perfect time to reexamine and rework how designers both view and use generative AI.

3 Problems

In the aforementioned papers' research, a majority of the content is either entirely generated by the AI utilizing a series of complex input parameters or generated via the usage of the AI in sections, with very simple inputs or instructions from designers used to guide the AI along the right path. I propose an extension of the mixed-initiative co-creation between AI and human designers proposed by Zhu et al., where game designers utilize a handcrafted, foundational source of content/systems as an input upon which an advanced generative AI can expand further. The human oversight and guidance that Kruse et al. suggest can and should be injected at any point during the development process, ensuring that the content the AI generates falls in line with what is required for said project. All of this while maintaining the transparency provided by a combination white-box/black-box system. Despite my support for their ideas, where I disagree with Zhu et al. & Guzdial et al. is on the idea that this system of implementation should be recognized as a dialogue between design partners. The human designer must realize that the generative AI system they are using is nothing more than a tool. AI systems are very powerful tools that can make well-reasoned and optimal suggestions, but the systems have no agency and are not nearly as intelligent as many people believe.

3.1 Anthropomorphism

Humans tend to anthropomorphize anything and see humanity where there is none. The study of anthropomorphism has become deeply linked with modern technology, especially with tech that is made to appear and act human in nature. As Festerling & Siraj puts it, anthropomorphism from human-like technology can lead to unrealistic expectations of human-like capabilities and agency in the technology (Festerling & Siraj, 2022, p. 15). At first glance, many people may assume AI systems to be all-knowing and can answer any question and craft any work of art from thin air, but that is far from the truth. Festerling & Siraj shatter this expectation by examining how everyday users of human-like technology, particularly digital voice assistants, begin to assume that said technology has human-like capabilities. Many people go so far as to assume said technology can understand the complexity of human personality and emotion and expect more nuanced responses tailored to themselves. In a similar regard, Wardrip-Fruin & Crumpton focused on the anthropomorphic aspects of chatbot systems, describing how people “assumed that since the surface appearance of an interaction with the program could resemble something like a coherent dialogue, internally the software must be complex” (Wardrip-Fruin & Crumpton, 2009, p.25). In their examinations, Wardrip-Fruin & Crumpton highlight how users with more computer science experience can still overestimate the capabilities of human-like technologies. Despite recognizing the system as merely a program, users assume complex inner workings that can achieve empathy and replicate memory, while in reality, many of the reactions are just a preprogrammed string of characters.

The very same assumption is being made with AI systems today, such as ChatGPT. I have personally seen people express genuine awe, confusion, fear, and even existential dread upon learning the sheer magnitude of ChatGPT’s capabilities. Admittedly, ChatGPT is much more complex than the primitive pseudo-AI Wardrip-Fruin & Crumpton were examining. Nonetheless, these AIs are still far from what most people consider sentient. These models are unable to process the world in the same way we do, have no agency of their own, and will work to produce solutions employing as little processing power as possible. This results in generated content that does not always align with the

designer's intended vision for the input prompts or content that may break somewhere down the line in unexpected ways. Festerling & Siraj warns that the potential for anthropomorphism to lead to unrealistic expectations highlights the importance of designing digital voice assistants with clear and accurate communication about their capabilities and limitations.

Furthermore, Ferrari & McKelvey explain how AI systems process the world in a "Matrix-style simulation that escapes the grip of social theory, synthetic media remain not only grounded in but also bounded by reality" (Ferrari & McKelvey, 2022, p. 18). In Ferrari & McKelvey's view, AI is unable to generate anything new, everything generated is bounded metaphorically by current society and culture, and to a more literal extent, by the data the AI system is trained on. Therefore it is very important that designers recognize this limitation as well and not expect generative AI systems to create any "out of the box" solutions or ground-breaking works of art, since they are incapable of such feats. Instead, designers must recognize how they can use the generative capabilities of AI as a tool to create such revolutionary works. AI has neither the intelligence nor the capabilities to understand the world outside of itself and the information that has been spoon-fed to it. For that reason, designers who wish to use generative AI systems must be intimately aware of their limitations as well as be mindful of how they plan to integrate the generated content into the grand scheme of their projects.

3.2 Bias

In a similar vein, AI systems are generally not built with the context of the rest of the world in mind. Despite the best attempts from its creators, AI systems are never free from bias², whether it is inherent bias from the databases the AI is built on or learned bias from the environment it is trained in or released to. The AI models we know today are built upon mountains of data and a few machine

² There are two approaches to mitigating the issue of bias: we can approach from the perspective of the AI creator or that of the AI user, which I do in the paper. Examining the issue from the lens of the engineers behind an AI system requires a certain admission of incompetence or ill intent, as these engineers are, for the most part, human and will either make mistakes or succumb to their own selfishness. In order to prevent either scenario from happening, Yu & Ali have noted how those in the legal field are demanding "greater algorithmic transparency, i.e., to oblige companies to release some mandatory information on their AI algorithms, in order to detect potential bias" (Yu & Ali, 2019, p. 6). Such a system would force developers of AI systems to have their work be double-checked. Similarly to the open line of communication between designer & AI systems that co-creation systems insist upon, lawyers are pushing for an open line of communication between developers and colleagues/users.

learning algorithms to utilize that data to fulfill some requirements in the simplest way possible. This means that generative AI models will tend to generate content that regresses to the mean extrapolated from its database. Since the content will be generated from data provided by the AI's creators, there could be serious inherent bias ingrained into the system, intentionally or not. In addition to the underrepresentation, or overrepresentation, of certain groups in datasets used to train AI models, Kuhlman et al. warn that computing fields broadly also suffer from the same under-representation issues that are found in the datasets we analyze (Kuhlman et al., 2020, p. 4). The datasets do not even need to be the source of the inherent bias, as the people who choose which databases the AI system is founded on could be the cause of the inherent bias. Furthermore, the training environment built for the AI could be flawed, introducing a learned bias or lacking the proper conditions to prepare the AI for release/integration.

Therefore, designers should not view working with generative AI systems as a dialogue between two creators, as it is important to acknowledge the systems' lack of intelligence or agency and the possible biased baked into the datasets from which the AI generates content. Furthermore, AI systems lack the ability to understand how the content they generate relates to the rest of the world since they are bounded by an echo chamber derived from the datasets they are built upon. Consequently, many of the issues examined can be mitigated via an implementation of the co-creation system, as long as the designer views the "AI co-creator" not as a person, but as a tool. Recognizing that the generative AI system can be biased or can generate content that is not optimal for the task at hand is essential for designers that want to incorporate AI models in their creative processes. Diligent human oversight and enough relevant knowledge to question the AI and not blindly accept answers, in addition to an intimate understanding of the AI's limitations, capabilities, and "reasoning" is integral effectively using generative AI. Hence, a proficient designer is necessary for the process, which challenges the popular assumption that generative AI will be the end of creative and white-collar jobs since an inexperienced designer would blindly accept any AI-generated, unable to discern the quality or bias of the content.

4 Personal Experiences

In any case, my perspective as a design-heavy developer has provided a bias that leans in favor of using generative AI in design work, as long as all the flaws are considered and addressed. In my explorations of the creative limitations of AI, I had begun examining how well ChatGPT 3.5 and 4 could replicate humanity's favorite way to communicate, storytelling. My preliminary testing involved examining how well ChatGPT 4 performed in the role of a Game Master (GM) in a tabletop role-playing game. I fed the AI a few pages of world-building and then a character and asked the AI to pretend to be a GM for a single-player campaign. ChatGPT was able to give me a moderately enjoyable experience exploring a city as a magical, old man. Multiple instances of mistakes occurred in the process of keeping track of spells, telling me one spell was cast at one moment, and reading me the effects of another spell the next. In the end, the campaign was cut short when I ran out of ChatGPT 4 tokens and my conversation was downgraded to version 3.5, which was unable to keep track of either the lore I had provided or the story that the AI helped generate. I think it is important to mention that while the experience was enjoyable, it was very boring. ChatGPT was clearly regressing to the mean plot points of any medieval fantasy series, taking no creative liberties nor adding its own twist. The best way to describe its GMing style was inhuman and machine-like, exactly what you would expect from an AI.

Furthermore, while discussing ChatGPT 4's ability to replicate content with a colleague, we came upon the idea to do another examination of its storytelling capabilities with a prompt from the opposite end of the spectrum, comedy. When prompted to write a new scene for a sitcom from the 90s, ChatGPT 4 was able to not only understand the specific comedic style of a sitcom but replicate it and actually illicit genuine laughs from fans of the show. Prompting ChatGPT to extend the scene into a full episode, bringing in side characters and referencing settings that can show would recognize. Once again, it is important to mention that while funny, the script was rather boring, and felt very formulaic

in the sitcom context, adding nothing new to the source material. The AI-generated content hit all the correct beats, but nothing was outstanding or particularly creative, just your average episode.

Nonetheless, these delves into AI content generation were rudimentary at best and did little to include the harmonious co-creation system I have been preaching throughout this paper.

4.1 Case Study

My aforementioned examinations of using generative AI in storytelling were very input heavy, lacking the human oversight and regulation which would lead to the harmonious co-creation I had previously suggested to be optimal for designers. In order to investigate the viability of the co-creation system as a designer, I examined its implementation to a pre-existing system of the Yu-Gi-Oh! Trading Card Game. In Yu-Gi-Oh!, there exists 10,000+ unique cards, which can be organized into decks of sizes 40-60. In order to optimize winning, players have developed strategies that utilize certain collections & combinations of cards in the form of “deck archetypes”. Each deck archetype follows the same general strategy and a core set of cards but varies in the exact selection of all the cards. Due to the sheer number of cards, possible card combinations, and card interactions, the act of designing the optimal deck to win tournaments is very similar to designing an entire game unto itself. Since most deck archetypes have their own set of mechanics and interactions which completely differ from others, as well as the constant release and enforcement of new limitations on decks & cards, a certain degree of creative thinking is required to design a viable deck. That being the case, I believed examining AI assistance in deck designing to be analogous to actual generative AI usage in design. In addition, Yu-Gi-Oh! cards, metas, and tournament rulesets are meticulously recorded onto online databases which can be accessed by anyone, perfect for ChatGPT 4 to be trained on.

Utilizing ChatGPT 4, I ran three trials that involved generating a tournament-legal deck under a series of specific conditions and inputs, then playing 10 games with that deck online to determine the deck’s strength (determined by the win rate). I allowed myself 5 “freebie” games to get adjusted to the

deck and its interactions which I did not calculate into the win rate. Usually, the process of deck-building is arduous, taking somewhere from a few hours to a few days to research the current meta, what cards are in play, possible strategies, etc. Utilizing generative AI in the design process not only allowed me to consider strategies and card combinations I would have not otherwise been aware of, I was also able to do all of it within minutes. Nonetheless, it is important to note that my own skills and game knowledge are considered to be average. Playing on the online space allowed me to see how well the deck interacted with a multitude of decks at a skill & knowledge level similar to my own. This allowed me to properly gauge the deck's strength against various other archetypes in an environment where my own skill would not be a limiting factor to the deck's potential.

4.1.1 Eldlich

For my first trial, I gave ChatGPT 4 no guidance other than the input “generate me a tournament legal yugioh deck”. Since ChatGPT 4 is trained on data from up to September 2021, the first deck it generated was an “Eldlich” deck, which was very powerful in the meta at the time. The “Eldlich” deck archetype is a very control-heavy deck, which is built on the idea of locking the opposing player out of the game via the core card “Eldlich the Golden Lord”, as well as protecting “Eldlich the Golden Lord” with a variety of spell and trap cards. The generated deck contained various cards that were banned or limited due to new rulesets that I replaced with copies of other cards ChatGPT 4 provided. The deck provided to me was very simple and I was able to understand the core combo almost instantly. However, the deck was unable to account for the current meta and I was unable to get “Eldlich the Golden Lord” onto the board a majority of the time. Across 10 games, I had a win rate of 10%. All things considered, the deck performed very poorly, lacking the tech cards necessary to counter current meta decks, and due to the nature of the conditions of the case study (initial inputs only, no guidance), I was unable to modify the deck to make it viable.

4.1.2 Swordsoul

In the second trial, I gave ChatGPT 4 no guidance other than the input “generate me a tournament legal yugioh deck with the swordsoul archetype”. By giving ChatGPT a specific deck archetype that existed in 2021 but was also currently viable, I hoped that the deck generated would be able to hold up against the current meta, unlike the “Eldlich” deck. The “Swordsoul” deck revolves around searching for and summoning the “Swordsoul” cards, which can be used to summon tokens, which can be used as materials to summon powerful cards that can destroy the enemy’s cards as well as win the duel. The deck contained a strong combination of core cards and additional tech cards which allowed me to hold off aggressive plays from the enemy and protect my own summoned cards. However, ChatGPT 4 made some strange card choices for the deck, choosing not to include a few cards that many would consider being integral to the “Swordsoul” deck archetype. Consequently, while much better than the “Eldlich” deck, ChatGPT 4’s “Swordsoul” deck was far from optimal and only allowed me to win 40% of the 10 games played.

4.1.3 Exodia

In the final trial, I gave ChatGPT 4 the input “generate me a tournament legal yugioh deck with the exodia archetype”. In addition to the initial input, I carefully cross-examined the AI-generated deck with the current meta “Exodia” decks and prompted the AI with additional inputs such as, “Why did you choose ‘Pot of Extravagance’ instead of ‘Pot of Desires’” or “‘Pot of Greed’ is currently banned, please give me a replacement”. The “Exodia” archetype focuses on getting the 5 pieces of “Exodia” into your hand, which triggers a win. I did this multiple times with a variety of cards in order to optimize the deck’s ability to achieve the win condition, working harmoniously with ChatGPT 4 to either replace the cards with better ones for the deck or debate the card choice and eventually come to an

understanding of why the card choice is optimal³. The resulting deck was something quite playable, but different from the typical “Exodia” decks. ChatGPT 4’s version of the deck archetype focused more on stalling the game until you drew all 5 pieces of “Exodia” cards, thereby winning the game, while a typical “Exodia” deck would focus more on forcing draw on your own turns to draw a winning hand as soon as possible.

However, despite the differences from the meta version of the deck archetype, the deck performed rather well in unranked duels. Overall, I was surprised at how viable the ChatGPT 4 deck “Exodia” deck was able to perform. It contained a variety of cards that provided strategies to deal with very specific edge cases, as well as a very powerful stalling engine that led to the win condition. I was able to maintain a 50% win rate across 10 games and generally enjoy the experience. However, I would have not been able to properly utilize the deck if I had not communicated with ChatGPT 4 to modify the deck and understand its card choices. Unlike the other decks, where I was essentially just thrown into duels with a deck crafted by someone else without any way to understand how to operate it besides trial and error, communicating with ChatGPT 4 allowed me to understand a majority of possible interactions I would have with other decks and understand how to optimally utilize the cards provided. Therefore, the system of harmonious co-creation of a Yu-Gi-Oh! deck between a generative AI with a vast database of deck statistics and a player with an average amount of skill was quite effective in creating an adequately strong deck. If a person with greater expertise (for example, a world-class, competitive Yu-Gi-Oh! player) were to “collaborate” with ChatGPT 4 to co-create a deck, the resulting deck would be even stronger.

³ Something interesting to note about the construction of Yu-Gi-Oh! decks is how modular they are. Decks are usually made of nearly entirely separate systems that interact with each other via one or two core cards. In addition, there are a variety of different interactable spaces in which cards can exist, such as your hand, deck, graveyard, banished zone, extra deck, monster zones, spell zones, pendulum zones, link zones, etc. In order to understand all of these interactions, many players view their cards modularly, switching out “modules” of cards in order to maximize certain interactions or counter others. This sort of understanding of design can permeate across fields, and as Russel puts it, “designers of modular systems are therefore able to swap modules in a ‘plug-and-play’ manner, which increases the system’s flexibility” (Russell, 2012, p. 258). In that context, Russel was talking about computer systems, but the quotation applies across a variety of fields. I bring up these ideas because throughout my explorations, it seems like ChatGPT 4 builds decks modularly. When I had cards be removed due to tournament bans, ChatGPT 4 always replaced entire selections of cards. It makes sense if you consider each deck to be made up of modules built upon very interdependent cards that would not work without a single one of them. While completely inhuman, many of ChatGPT 4’s processes are very human-like, as if taking inspiration from its creators.

5 Implications

Ultimately, we should take a step back to consider the real-world implications of the ideas examined in this paper. Adding generative AI to the toolbox of designers is a revolutionary step in human creativity akin to the advent of computers. Many of the creative problems regarding utilizing generative AI in design can be mitigated via proper communication between the AI systems and the designer, as well as diligent human guidance to ensure the program doesn't go astray. Various examinations of my own personal experiences utilizing generative AI in harmonious co-creation in the fields of creativity and design have proven to be fruitful and lead me to be hopeful for a world where this is the norm. In such a world, the design process will be streamlined for experienced designers who will have a majority of their experimental generation work automated to allow them to explore various avenues of creation without excess effort. In addition, beginners would be able to take preliminary excursions into topics utilizing self-explaining generative AI, allowing them to learn the basics of how and why things work in a said topic, as long as the beginner recognizes the limitations of the AI system and/or is informed of them by said AI system. The implications of these applications are numerous and spread across a variety of seemingly unrelated fields. Academics in particular worry about how generative AI systems will affect the worlds of politics and culture.

5.1 Society & Art

The more immediate concern of many is how generative AI systems, and the content that the systems produce, should be viewed in the eyes of human culture. The most logical step forward in understanding this revolutionary technology should be to examine similar patterns in the past. I view the advent of generative AI technology to be similar to the release of audio engineering technology to the masses. Consider how generative AI remixes material from its datasets into "new" content. This

system is analogous to how producers sample tracks and create their own music from it (albeit, with the generative AI, there is a lack of human creativity). Of course, if a so-called producer were to sample a variety of tracks to produce a song that sounds very similar to another song, that would be considered copying and result in cultural shame and legal action. However, when done correctly, and tastefully, sampling is considered to be an art. On that note, if content generated by AI were to be used in a tasteful manner, I believe that usage of data to be ethical, as the original work is only being drawn upon in a manner similar to inspiration. Furthermore, if using an AI to generate content results in something clearly derived from data scraped from a specific work that does little to add to the source material, it should be considered unethical and legal action should be allowed against it.

Accordingly, it is evident that human guidance in generative AI systems will result in maintaining integrity and originality in the design process of all fields. Taking a step back from the audio sampling metaphor, one can see how similar training generative AI systems is to a human learning from the works of masters and taking inspiration from them to create their own works (mentally remixing ideas). We can even see it in the wordage we use, with both artists and AI systems being “trained” to create. On that note, Inie et al. suggests a “more comprehensive inclusion of creatives in the development of specific generative AI models” (Inie et al., 2023, p. 5). The development of generative AI models is kindred to the development of human experts in their respective fields and therefore it is only logical to consult the masters of the fields generative AI systems are attempting to replicate. As Anantrasirichai & Bull put it, “humans will need to check the outputs from AI systems, make critical decisions, and feedback ‘faults’ that will be used to adjust the model” (Anantrasirichai & Bull, 2021, p. 49). These experts have generations of expertise on the human version of data-driven training of generative AI systems and it would be wise to consult them on how we should build the AI models and view the content these systems generate both culturally and legally. Unfortunately, as it currently stands, the majority of policymakers are very out of date with current technology, and many barely understand how the “Internet of Things” works.

5.2 Technology & Policy

The introduction of rather complicated terminology and systems in the form of generative AI has thrown the policymakers of the world into chaos. For example, Ferrari & McKelvey describe how “Without adequately representing the complexity of AI-generated media (i.e. by making it intelligible to a broader audience), its cross-sectoral role and implications will not find the appreciation that it requires, within both academic and policy circles” (Ferrari & McKelvey, 2022, p. 18). The first step towards better legislature on generative AI is a better understanding of the development behind the systems as well as their usage, capabilities, and limitations. The inclusion of experts in arts fields would help to bridge the gap in communication between developers (who lack the skills to do so) and policymakers (who lack the expertise necessary and the ability to gain such expertise). On top of that, in the case that co-creative, generative AI systems become more widespread and accessible to policymakers, they could have had their own time to experiment with the systems in ways that would allow them to fully understand how and why the systems generate content. Policymakers would be able to form their own opinions through testing the systems’ capabilities and limits, even more so if ample communication is provided to the user via visual, auditorial, or textual explanations of the systems’ actions, by the systems.

On that note, West & Burbano put it best when they wrote about “a vision of the arts bringing AI into an embrace with the pluripotent multiplicities of meaning that might emerge from new forms of agency in a human-AI co-creative partnership” (West & Burbano, 2020, p. 4). Hopefully, policymakers will be able to come to this understanding of the unlimited and revolutionary, potential boons that generative AI systems would provide to human creativity under the right regulations. If they are unable to understand that on their own, it is the duty of a multidisciplinary effort of both experts in technology & arts to lead them to this answer. Furthermore, using AI-assisted design as a basis, the ideas of a harmonious co-creation system could possibly be expanded upon and extended into other fields of study beyond law and the arts. Integration into other STEM fields that currently

view AI to be too volatile and prone to mistakes could be possible, especially with a co-creation system that puts emphasis on human oversight and guidance.

6 Conclusion

In conclusion, this paper has provided a comprehensive analysis of the integration of generative AI systems into the creative process. The paper focused on the potential advantages, challenges, and ethical issues that are associated with this integration. It is quite clear from the explorations of a variety of approaches to AI collaboration that the creative industries of the future will involve some form of my proposed harmonious co-creation between human designers and AI systems. We can overcome the limitations of older models and fully embrace the advantages of AI-driven creativity through an extensive understanding of the internal workings of modern generative AI through self-explaining systems that are analogous to dialogues between AI systems and human designers. All while carefully recognizing the capabilities, limitations, and lack of humanity of AI systems. On that note, this paper has emphasized the significance of addressing contentious generative AI issues like anthropomorphism, AI system biases, and the requirement for human oversight. We can reduce potential risks and improve the creative process by treating AI systems as tools rather than intelligent agents and ensuring that designers have the relevant knowledge and experience to question and examine AI-generated content.

This paper's case studies, including the use of ChatGPT 4 for storytelling, tabletop role-playing games, and Yu-Gi-Oh! Trading Card Game deck building, have shown the worth of human oversight and direction through the development process. These investigations additionally offer significant bits of knowledge into encouraging viable and harmonious co-creation between human designers and generative AI systems. Furthermore, the paper emphasized the significance of addressing the broader societal, cultural, and legislative issues that arise when generative AI systems are implemented in the design process. By participating in a multidisciplinary effort with experts from the fields of technology,

the arts, and policy, we can work to guarantee that AI systems are utilized in a responsible and ethical manner, that appropriate regulations are in place to safeguard intellectual property rights, and that the human creative process is protected. The field of artificial intelligence has enormous potential for human-AI collaboration in creative industries. It is essential to remain vigilant when dealing with the difficulties and ethical concerns that arise as we continue to investigate and improve the incorporation of generative AI systems into the creative process. By encouraging a fate of morally mindful and agreeable co-creation among originators and simulated intelligence frameworks, we can open the maximum capacity of generative AI systems in combination with human imagination to reform the creative process to support all.

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