

Exploring post-phenomenological perspectives on creativity with GPT-4

Paper type: CC bridges

Giovanni Lion

School of Design

The Hong Kong Polytechnic University
11 Yuk Choi Rd, Hung Hom, Hong Kong
giovanni.lion@gmail.com

Abstract

This paper explores the use of post-phenomenology, a contemporary philosophical movement, as a framework for understanding the relationship between humans, technology, and creativity. The theory of mediation proposed by Don Ihde is employed to categorize different types of technological relations that shape creative contexts. Large Language Models (LLMs) are used to generate post-phenomenological descriptions of arbitrary examples of technology. The generated formalizations can be evaluated and refined theoretically, contributing to the evaluation of the theory’s applicability to various creative scenarios. This *remedial* attitude in proceeding emerges as a methodological bridge between computational creativity and design. Furthermore, reflecting on this process of inquiry highlights the inherent creative potential of LLMs and their application in exploratory practices.

Introduction

Post-phenomenology, an interdisciplinary and contemporary philosophical movement, has emerged as a significant framework in design research for understanding the complex relationship between humans and technology (Ihde 1990; Verbeek 2015; Latour 2008; Benjamin et al. 2021). The Computational Creativity (CC) community has been critically examining the role technology has in shaping our creative processes and products, and one potential avenue to approach this examination is through the lens of post-phenomenology. By adopting a post-phenomenological interpretation of technology, the CC community can gain a deeper understanding of the ways in which humans and non-human entities interact creatively with technology. This interpretation recognizes that our interactive experiences with the non-human are not solely determined by the technology, but also by the contexts, practices, and social norms in which they are embedded. Ultimately, developing a post-phenomenological view of technology can help the CC community better understand and engage with the complex and dynamic relationships between humans, technology, and creativity.

Don Ihde’s work provides a useful framework for understanding the complex relationships between humans, technology, and the world. According to Ihde (1990), the idea of *mediation* could be schematized as follows:

- Unmediated perception: I—World
- Mediated perception: I—Technology—World

He identifies four fundamental types of relations that characterize these interactions, summarized in Table 1. The first type is *embodiment* relations, in which technologies unite with a person and point their unity outward at the outside world. Examples of this type of relation include using a phone to talk to other people or viewing objects through a microscope. In *hermeneutic* relations, people interpret how technologies reflect the world, such as reading an MRI scan or using a metal detector to detect metal. In *alterity* relations, people engage in technological contact with the outside world acting as a backdrop, as in the case of interacting with robots or using ATMs. Finally, Ihde distinguishes between *background* connections and technologies that frame human experiences and behaviors, such as the sounds of air conditioners or notification sounds from cellphones during

Name	Form	Definition
Mediated Embodied	$(I - T) \rightarrow W$	Broaden the area of sensitivity of our bodies to the world (e.g. glasses, a dental probe, a paintbrush)
Mediated Hermeneutic	$I \rightarrow (T - W)$	Provide a representation of the world that we need to interpret (e.g. thermometer, watch)
Alterity	$I \rightarrow T (- W)$	Humans are related to or with technology as a quasi-other (e.g. ATMs, robots)
Background	$I (- T / W)$	Shapes the context of our experience in a way that is not consciously experienced (e.g. refrigerators, central heating system)

Table 1: A summary of the relations types proposed by Ihde and their formalization. In the examples in the second column, I represents the human, T stands for Technology, and W refers to World.

a conversation. By understanding how these different types of relations shape the creative context, it is possible to gain better insight into how technology can be used to support and enhance the creative process.

The theory also comes with notation system defined as follows:

- simple connections between entities
- interpretation of one by the other
- () being experienced together
- / being in the background of another entity
- [] being already contextualized before being processed

This paper explores the explanatory capabilities of mediation theory by employing GPT-4 to generate formalizations of arbitrary instances of technology. Starting from a prompt containing the theory and some examples, GPT-4 is asked to analyze the use of a technology and return the post-phenomenological notation for the mediation. On one hand, this approach contributes to evaluate the theory’s applicability to various creative scenarios. On the other, it showcases the potential of Large Language Models (LLMs) as a creative tool in academic research and analysis.

Towards a post-phenomenology of computational creativity

Embodied mediation is perhaps the stereotypical form of creative technology use. We imagine a painter with a brush in their hand, a musician with their instrument and a writer with their pen. However, what seems to characterize the mediation in creative endeavors is the non-utilitarian context of the action, holding the stage in the *background* (*I*). Consider the example of a pencil. It can be used to write a grocery list or to draw a sketch. In post-phenomenological terms we could describe the two forms of mediation as:

1. $(I - Pencil) \rightarrow GroceryList$
2. $(I - Pencil) \rightarrow Sketch$

However, these formalizations fail to capture the different contexts in which the mediation takes place. Contextualizations, represented by C_n , can help us identify a specific framing that is applied to the mediation’s conceptual input. For example we could expand the examples as:

3. $(I - Pencil)/C_1[Items] \rightarrow GroceryList$
4. $(I - Pencil)/C_2[Subject] \rightarrow Sketch$

where C_1 is most likely a *shopping* context, while C_2 is the domain of *visual artistic expression*. To better understand these formalizations, it may be useful to imagine how the same contextualizations might be applied to a different output:

5. $(I - Pencil)/C_1[Items] \rightarrow Sketch$
6. $(I - Pencil)/C_2[Subject] \rightarrow GroceryList$

Mediation in sentence 5 could represent a sketch of items used as shopping list, while sentence 6 would suggest an artistic piece, perhaps a poem, produced as a list of groceries.

In CC literature there are numerous examples of systems affording mediation spanning all forms of relations, but the discussion about non-human creativity roughly coincides with discussing the notion of *alterity* in post-phenomenology. Frieder Nake, a pioneer in *generative art*, already saw this as a critical aspect of his type of work when he said: “the individual human subject simply did not exist anymore, once he or she had set the boundary conditions for the image to be computed”. Nake repurposed plotters, originally used for technical drawing and used them to generate artistic designs based on generative algorithms. We can frame Nake’s new formed relationship with the plotter (8) in comparison with its generic form (7)

7. $I \rightarrow Plotter(-TechnicalDrawing)$
8. $I \rightarrow Plotter/Art[Nake'sAlgorithm](-Designs)$

Explorative prompting

A technological relation is not immediately obvious to the observer and in some cases its formalization may be ambiguous and in need for clarification. In order to explore how this theory might represent different instances of technological mediation it is possible to test its explanatory power by evaluating specific examples.

LLMs, such as GPT-3.5 and GPT-4 have shown the ability to manipulate relatively formal language compositionality, such as the one adopted by Ihde’s theory. In an attempt to produce plausible formalizations, I explore the use of LLMs to generate post-phenomenological descriptions, starting from a prompt containing a brief summary of the theory and some examples.

Prompt	GPT-4 response
Car	$I \rightarrow Car$ (— Transportation)
Computer	$I \rightarrow Computer$ (— Data Processing)
Caliper	$I \rightarrow (Caliper$ — Measurement)
Railway system	I (— Transportation / Railway System)
Joystick	$(I$ — Joystick) \rightarrow Game Control
Electrical plug	I (— Electrical Plug / Power Supply)
Door	$I \rightarrow Door$ (— Access Control)
Door handle	$(I$ — Door Handle) \rightarrow Door Opening
Operating a door handle which is part of an art installation	$(I$ — Door Handle) / Art[Installation] \rightarrow Interaction

Table 2: This table contains GPT-4 responses to the user message specified in the first column.

The examples in Table 2 show that the prompt used is sufficient to allow simple technologies to be accurately described. From this starting point, it is then possible to challenge GPT-4 with more complex technologies. For example, when prompted with the abstract of Colton’s paper describing “The Painting Fool” (Colton 2012b), it simply returns

9. $I \rightarrow ThePaintingFool(-CreativeArt)$

It is possible to ask more explicitly to extend a particular mediation, in order to explore possible expansions. Table 3 shows how to prompt the model to follow a particular form when generating the expansion. However, GPT-4 does not perform this kind of instructions reliably: the generated items put the contextualization before the interpretation symbol (\rightarrow), while the prompt explicitly specifies the opposite order.

User: $I \rightarrow The\ Painting\ Fool / *Background \rightarrow *Contextualization[*Input] (\text{--- Artistic Creation})$
 Replace the elements starting with * in this formula, introducing background relations, contextualizations and their inputs. Give me three examples.

$I \rightarrow The\ Painting\ Fool / Art\ History[Paintings]$
 $\rightarrow Interpretation (\text{--- Artistic Creation})$

$I \rightarrow The\ Painting\ Fool / Color\ Theory[Palette]$
 $\rightarrow Selection (\text{--- Artistic Creation})$

$I \rightarrow The\ Painting\ Fool / Human\ Preferences[Feedback]$
 $\rightarrow Adaptation (\text{--- Artistic Creation})$

Table 3: Background expansions on “The Painting Fool”.

The bot can also be asked to explain verbally its own examples of background relations expansions, as shown in the conversation presented in Table 4. These generated relations can then be evaluated and potentially further explored and refined theoretically.

It is important to note that in this process there are no expectations of GPT-4 producing *correct* answers. In fact, inaccurate formalizations are perhaps more valuable in a theory building context because they can highlight ambiguous elements that require deeper inquiry. Attempting to evaluate GPT-4’s output is in itself an act of reflection (Schön 1991) over the theory and its operationalization. For example, by looking at the background relations described in Table 4 some considerations may arise. First, the data-driven nature of LLMs is not represented explicitly. Second, all the results presented by GPT-4 present the background relation attached to the I, before the interpretation step (\rightarrow), which is unexpected, but also meaningful. The ordering is different from the one used in Table 3; this form might emphasize the way our existing background relations affect our expectations about a given technology. These considerations are only possible because GPT-4 *deviated* from the instructions and examples in the system prompt.

Being presented with incomplete or incorrect examples is conducive to deeper and more precise reflections that can lead to theory improvements. It may be possible to general-

User: GPT-4 used for creative writing

$I \rightarrow GPT-4 (\text{--- Creative Writing})$

User: Can you expand the formula highlighting some of the major background relations and contextualizations involved? Give me three examples of expansions of this formula $I \rightarrow GPT-4 (\text{--- Creative Writing})$

Sure! Here are three examples of how the formula $I \rightarrow GPT-4 (\text{--- Creative Writing})$ can be expanded to include background relations and contextualizations:

1. $I (\text{--- Writing / Literature}) \rightarrow GPT-4 (\text{--- Creative Writing})$
 In this expansion, the background relation is the long history of writing and literature that has shaped human creativity and expression. GPT-4 is contextualized within this history as a new tool for creative writing, building on the legacy of human writers and their works.
2. $I (\text{--- Technology / AI}) \rightarrow GPT-4 (\text{--- Creative Writing})$
 Here, the background relation is the broader context of technology and artificial intelligence that has enabled the development of GPT-4. The formula highlights the role of GPT-4 as a product of human ingenuity and technological progress, and its potential to transform the field of creative writing.
3. $I (\text{--- Culture / Society}) \rightarrow GPT-4 (\text{--- Creative Writing})$
 In this expansion, the background relation is the cultural and social context in which creative writing takes place. GPT-4 is situated within this context as a tool that reflects and shapes cultural values, norms, and practices. The formula highlights the potential of GPT-4 to challenge existing cultural assumptions and to open up new possibilities for creative expression.

Table 4: Background relations expansions on “GPT-4 used for creative writing”.

ize this phenomenon to a case of mediation where generative tools are used in a context where *mistakes* are not penalized. In such situations, divergence might be desirable because errors and misclassifications constitute a starting point to improve the process.

As proposed by Hoorn (2023), probabilistic models can be considered inherently creative because they are error-prone. Expanding on Hoorn’s account of text-to-image models, it seems that LLMs also allow for a chance to encounter unexpected variations and broken results that can inform further interaction and adjustments. This iterative process is very familiar to design practices, as Bruno Latour suggests “[Design] is never a process that begins from scratch: to design is always to redesign. There is always something that exists first as a given, as an issue, as a problem” (2008). Boden’s account of *exploratory* creativity (1992) might perhaps fit Latour’s description of design. The argument in favor of data-driven generative tools in this context is that they do not always work as expected, therefore allowing explorations beyond the boundaries of mental fixation.

A bridge from CC to design

The relationship between CC and design is a crucial aspect to consider when examining the broader implications of post-phenomenology in creative practices. Design, as an inherently creative field, involves problem-solving, decision-making, and generating novel solutions. Design researchers are often interested in evaluating practical applications of CC systems (Kim 2023; Liu 2022) or investigating the interaction with as *alterity* relation (Algarni 2020; Ragot 2020). Yet, I believe there is value in creating a better theoretical understanding of how technological mediation takes place in a creative context.

For example, understanding how *background* relations shape the expectations attached to a creative system warrants a deeper comprehension of the technology used, its inner components and the social environment in which is embedded. Forming this multi-faceted perspective requires bridging knowledge about output and process evaluation, topics that are thoroughly discussed in the CC community (Jordanous 2012; Wiggins 2006; Colton 2012a), with considerations about technological interaction and its impact on society, which is a topic central to design.

According to Latour (1990), technology is what makes society durable, as a purely social world cannot exist. Stability is generated through the assemblage of a diverse network of humans and non-humans. Latour illustrates this by explaining that a door is a prime example of a heterogeneous network. If a door were to be removed, a lot of effort would be required by the human to achieve the same purpose. To enter, a new hole would need to be made and then bricked up. However, with the door, both the human and non-human can work together to allow entry. The door must be presented in a way that it can be opened, and the human must interact with it in a specific way to open it. Latour believes that the symmetry of this interaction is what creates stability in society.

This analogy applied to a creative context is extremely powerful, as it allows for a non-dual way to look at creative practices mediated by technology. If the mediation happens in a creative context, the contextualization of the technology becomes crucial in shaping the expectations and outcomes of the creative process. This means that the technological tools used in a creative project are not neutral but actively shape the creative process and its outcomes. Therefore, understanding the technological mediation in a creative context requires a multi-disciplinary approach that encompasses both CC and design perspectives.

The intersection of CC and design provides a valuable opportunity to study the role of technological mediation in creative practices. Understanding how technology shapes creative processes and outcomes requires a multi-disciplinary approach that encompasses both output and process evaluation from the CC perspective and considerations about technological interaction and its impact on society from the design perspective. By bridging these two fields, a better theoretical understanding of technological mediation in a creative context can be achieved. This understanding is critical in developing more nuanced and effective approaches to leveraging technology for creative endeavors.

Limitations

While the post-phenomenological framework offers valuable insights into understanding the complex relationships between humans, technology, and creativity, it also has its limitations. One limitation is that the framework is primarily descriptive and does not provide clear guidelines on how to design or evaluate creative technologies. Moreover, the formalization of human-technology relations using Ihde's notation system may oversimplify the intricate dynamics that occur in real-world creative scenarios, and may not fully capture the nuanced and context-dependent nature of these interactions. Further investigation is needed to form a more systematic and rigorous methodology to evaluate the post-phenomenological framework in the context of computational creativity and design.

Another limitation lies in the epistemological status of post-phenomenological claims. Without a coherent methodology, post-phenomenology may not provide replicable and consistent findings that possess predictive power, essential for scientific advancement. Drawing from post-modern thought and potentially introducing relativism into research outcomes, post-phenomenological investigations may struggle to deliver lasting and transferable insights. To ensure more robust scientific exploration, a better understanding of the role of language in human-technology interactions and the integration of more empirical language approaches may be required (Smith 2014).

Conclusions

This paper explored the potential of post-phenomenology as a framework for understanding the relationship between humans, technology, and creativity. By being exposed to the post-phenomenological interpretation of technology, the CC community might develop a deeper understanding of the different ways in which the human and non-human can interact in creative practices. The theory of mediation proposed by Don Ihde was used to produce descriptions of interactions using GPT-4. The generated formalizations and their shortcomings showed potential directions for improvement of the theory. Furthermore, the exploration of the theory's explanatory power using GPT-4 highlighted the importance of *background* relations and contextualizations in shaping technological mediation in creative practices. The relationship between CC and design was also discussed in the context of post-phenomenology, showing synergies and similarities between disciplines, which may foster opportunities for collaborations.

References

- Algarni, A. 2020. Neuroscience of creativity in human computer interaction. In Arai, K.; Bhatia, R.; and Kapoor, S., eds., *Proceedings of the Future Technologies Conference (FTC) 2019*, 248–262. Cham: Springer International Publishing.
- Benjamin, J. J.; Berger, A.; Merrill, N.; and Pierce, J. 2021. Machine learning uncertainty as a design material: A post-phenomenological inquiry. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, CHI

- '21. New York, NY, USA: Association for Computing Machinery.
- Boden, M. 1992. *The creative mind*. London: Abacus.
- Colton, S. 2012a. Computational creativity: The final frontier? volume 242, 21–26. IOS Press Nieuwe Hemweg 6B Amsterdam 1013 BG.
- Colton, S. 2012b. *The painting fool: Stories from building an automated painter*, volume 9783642317279. Springer-Verlag Berlin Heidelberg. 3–38.
- Hoon, J. F. 2023. Computer-vision classification-algorithms are inherently creative when error-prone. In *Proceedings of the 18th ACM SIGGRAPH International Conference on Virtual-Reality Continuum and Its Applications in Industry, VRCAI '22*. New York, NY, USA: Association for Computing Machinery.
- Ihde, D. 1990. *Technology and the lifeworld*. Indiana University Press.
- Jordanous, A. 2012. A standardised procedure for evaluating creative systems: Computational creativity evaluation based on what it is to be creative. *Cognitive Computation* 4:246–279.
- Kim, J. 2023. The effect of AI-based inspiration on human design ideation. *International Journal of Design Creativity and Innovation* –.
- Latour, B. 1990. Technology is society made durable. *The Sociological Review* 38(1_suppl):103–131.
- Latour, B. 2008. A cautious prometheus?: A few steps toward a philosophy of design (with special attention to peter sloterdijk). *Annual International Conference of the Design History Society*.
- Liu, V. 2022. Design guidelines for prompt engineering text-to-image generative models. –. Association for Computing Machinery.
- Ragot, M. 2020. AI-generated vs. human artworks. a perception bias towards artificial intelligence? In *Conference on Human Factors in Computing Systems - Proceedings*. Association for Computing Machinery.
- Schön, D. A. 1991. *The reflective practitioner*. Taylor & Francis Ltd.
- Smith, D. 2014. Rewriting the constitution: A critique of 'postphenomenology'. *Philosophy & Technology* 28(4):533–551.
- Verbeek, P.-P. 2015. Beyond interaction: A short introduction to mediation theory. *Interactions* 22(3):26–31.
- Wiggins, G. A. 2006. A preliminary framework for description, analysis and comparison of creative systems. *Knowledge-Based Systems* 19(7):449–458.