Algorithms' Influence on Human Artistic Creativity

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In this doctoral research programme, I propose a set of three thematic research projects to investigate the influence of algorithmic curation on artists' creative processes and viewers' subsequent creative perception. In the context of the burgeoning "creator economy," I first review evidence of algorithmic impact on creator's outputs. Considering the role of process in creative output evaluation, I bring an embodied, situated perspective to online creativity. Based on these discussions, I propose three research streams: first, I tease apart the consid-eration of process from the consideration of embodiment, asking how each (process & embodiment) influence creative perception in the context of algo-rithm-made versus human-made art. In this workstream, I also consider the im-pact of the art viewer's embodiment (physical versus digital). Next, I construct an algorithmically-curated website of visual images which controls information about the artist, their process, and their output, using the website as an experi-mental sandbox to interrogate the role of these variables in online creative per-ception. Finally, I supplement these findings through ethnography with artists and curators, examining the role of algorithmic considerations in their process. Simultaneously, I prompt artists to imagine the possibility of a co-designed algo-rithm that prioritizes creativity over existing metrics for engagement.

1. Introduction & Research Purpose

In the face of increasing technical automation, many see creativity as a final bastion of humanity (Moruzzi, 2020), claiming that computers cannot supplant artists (Hertzmann, 2018). Technology companies, however, see creativity as a profitable opportunity: 2020 heralded the "creator economy," an explosion of technologies for creators. In this burgeoning economy, algorithms prioritize creative content, inspire creative ideas, platform creators, and determine creative value. Though algorithms have been imbued with these responsibilities, algorithmic technologies are ill-suited to creative use-cases: algorithms operate by pattern-matching, while creativity prizes novelty.

As algorithmic platforms curate creative content, they are given agency over cultural trends. Duchamp made a urinal into an artwork simply by displaying it. Similarly, when algorithms exhibit creative content online, they deem certain pieces valid and valuable. As digital-era Duchamps, algorithms shape what readymade content is put on our cultural pedestal.

This doctoral research programme investigates how algorithms impact humans' perception of creativity. In particular, I ask how artists change their creative processes to suit algorithmic gatekeeping. Early findings indicate that creators pander to algorithms, producing pieces that they believe algorithms will prioritize. In this way, creative professionals' perception of algorithmic tastes influences the creative work that is produced, thereby shifting humanistic culture.

2. Background and Related Work

The creator economy has heralded the use of digital platforms for viewing artistic content. This allows creative professionals to interface with their viewers, allowing direct audience interaction in artistic curation processes. Ideally, the process of digital curation democratizes the value of creative work, minimizing judgments from elite institutions (e.g., museums and auction houses) that previously wielded gatekeeping power. However, in previous research (Herman, under review), creators revealed that they now shift their creations according to how they perceive the tastes of platform's algorithms, similar to previous artists seeking to appease collectors or curators. In pandering to the algorithm, artists figure it a central character in their creative output. In contrast with respected curators of previous generations, however, the hosting platform's ranking algorithm is perceived as deprioritizing content that is truly creative.

As algorithms continue to maintain curatorial roles online, more creative professionals will begin to produce pieces that are either a) explicitly designed according to algorithmic priorities or b) influenced by algorithmically-curated content that inspires designers and artists. This will produce a feedback loop by which AI influences what is created and curates creations accordingly, influencing cultural tastes.

In previous research (Herman & Hwang, 2022), I found that creative professionals (but not laypeople) fixated on evidence of artistic process when making creative judgments in algorithmic environments. This runs counter to previous creativity research, which discounts the role of process information in creative judgments. The creative professionals' focus on process may be explained by theories of embodied cognition (Chiel & Beer, 1997; Gallese & Lakoff, 2005; Wilson, 2002), in which one's perception is grounded in mimesis (Gebauer & Wulf, 1995; Zlatev, 2008). Creative professionals evoke a practice-based and experiential model of cognition when perceiving an artwork. If creative professionals perceive an embodied process that is particularly novel, they find it more creative. This highlights the role of embodiment in creative perception, which has not been robustly addressed in the literature—particularly in relation to AI—even though the perceived embodiment of the artist is deemed a key aspect of observers' response to artwork (Freedberg & Gallese, 2007). In this programme, I plan to address the impact of practice-based embodiment on creative perception in algorithmic environments.

Research question(s):

1. How do algorithms relate to creative processes?
   a. What role does process play within the digital audience's conception of creativity?
   b. How does the perception of a (human or algorithmic) artist's embodied process influence the viewer's evaluation of creativity?
   c. How do creative professionals shift their creative processes and outputs to suit algorithmic gatekeeping?
2. How might technologists construct an algorithm that prioritizes creativity over engagement?

3. Expected Contributions

My PhD will result in an integrated thesis, spanning three key topics in a unified dissertation. Therefore, my project plan/timeline consists of one thematic project for each of three years.

3.1 Project Plan & Timetable

Year 1: Human & Algorithmic Creative Embodiment *[Underway]*

To examine the role of embodied process in the perception of AI-generated art, I am taking an experimental approach, teasing apart the importance of embodiment from the importance of process by controlling the process-related information provided to study participants. 120 participants are assigned to one of four conditions, in which they are shown either: (AI-1) an AI-generated piece, (AI-2) the

same AI-generated piece + a video of the algorithm being created and operationalized by the artist to produce that art piece, (NAI-1) a digital illustration, (NAI-2) the same digital illustration alongside a time-lapsed video of that illustration being physically created by the illustrator. Leveraging these initial results, I am collaborating with the Serpentine Galleries, where several AI art pieces are displayed. With the curators, I am arranging two conditions: the first being the "physical" condition, representing embodied AI art viewing, the second being the "virtual" condition, representing digital AI art viewing. In each condition, participants will see the same AI-generated art piece, selected and curated by the Serpentine curation team. I will observe, interview, and survey the viewers in each condition.

Year 2: Process in Creative Judgments

I will create an algorithmically-driven study website that mimics image search platforms but controls information regarding the creator, process, and outcome of each creative piece. Each piece will be presented to participants with or without the artist's name, process description, or final output. In addition to completing a 1:1 interview, participants will also complete a series of creative evaluation tasks online, and they will log their responses through surveys and open-ended questionnaires. I will analyse the data by applying correlational statistics, sequential behavioural analytics, and hierarchical qualitative coding techniques. By carefully varying which information is provided, I will glean insight into which variables influence creative judgments, thereby investigating the role of creative process in creative judgments within algorithmic environments.

Year 3: How Algorithms Shift Creative Processes

In my final year, I will conduct research that will necessarily build on the results of the previous studies', filling in any gaps in a cohesive understanding of algorithmic impact on creative processes. Therefore, the approach may change to ensure cumulativeness. That said, I plan to conduct ethnography with artists that display their work in algorithmic contexts, examining how their processes and outputs pander to algorithmic prioritization. I also plan to moderate interviews and focus groups with curators to test hypotheses about how algorithmic experiences influence the pieces to which they ascribe creative value.

3.2 Outcomes, Deliverables, and Impact

For each of the three thematic areas, I plan to present initial results at relevant academic conferences and to publish final results in peer-reviewed papers. This research will also impact two external sectors. First, this research will inform technology companies developing creative tools, including Adobe, Google Arts &

Culture, and Behance, where employees have committed to following this project's recommendations. Second, this research will inform cultural institutions grappling with the digital expectations of pandemic-weary visitors seeking digital collections, engaging social media strategies, and compelling online curation. For example, the Serpentine Galleries' Research & Development Platform, which is focussing on "Creative AI," has indicated that they would welcome my guidance for producing embodied experiences with AI-driven art and curation.

Finally, concurrent to this work across years 1-3, I will foster an artistic collaboration to co-create an art piece that expands on my research results, leveraging a "research by design" (Zimmerman, Forlizzi, & Evenson, 2007) approach. Selected artists and I will co-create an algorithm that optimizes for creativity rather than engagement, resulting in a software-based art piece that interrogates algorithms' current prioritization structure. By including artists in this process, I will ensure that I prioritize their intents and needs in building an alternative to common profit-driven models. By shifting algorithmic design into the hands of artists, I aspire to overturn the current model of curating creative content online, which prioritizes profitable user engagement over true human creativity. Several arts institutions, such as Art Hub Copenhagen and Arts at the Old Fire Station, have already committed their interest in facilitating artistic workshops and exhibiting the final outputs.

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