

# Conceptual Art Made Real: Why Procedural Content Generation is Impossible

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## ABSTRACT

Procedural content generation is impossible: insofar as it is popularly understood as the generation of artifacts that can give us the same experience as if a human had crafted them by hand, it involves an intrinsic contradiction. If a thing has been generated once, it can be generated again. Kate Compton has introduced a term for this unending content: liquid art. Compton’s category of the “Bach faucet” describes the way that the endless supply of generativity destroys rarity. Conceptual art provides some examples of navigating this paradox. The PCG community is uniquely positioned to provide direction because of its existing understanding of the properties of generativity as an art form.

## CCS CONCEPTS

• **Applied computing** → **Computer games**; Media arts; • **Computing methodologies** → Philosophical/theoretical foundations of artificial intelligence.

## KEYWORDS

procedural content generation, liquid art, bach faucet, conceptual art

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## 1 INTRODUCTION

Procedural content generation is impossible. PCG, insofar as it is popularly understood as the generation of artifacts that can give us the same experience as if a human had crafted them by hand, involves an intrinsic contradiction: one oft-mentioned justification for using PCG is that it will let us create content for games with less labor. One source for this idea is a talk by Will Wright, in which he discussed the “content arms race” of more developers being required to fill the ever-growing content needs [38].<sup>1</sup> Today,

<sup>1</sup>While there are, of course, other motivations for using PCG, this labor-replacement framing is often mentioned as a motivation for using PCG [15, 18, 34].

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we’re confronted with the opposite problem: advances in machine learning mean that generating an image merely requires prompting a neural network and waiting a few seconds [30]. While it won’t be replacing game asset creation just yet, we are currently grappling with the preview of what it looks like when you have *too much* image generation.

However, past the initial excitement, there is a certain amount of dissatisfaction: the average machine-learning aesthetic has been called “banal uniformity” [10], and looking at other peoples’ generated images has been compared to hearing about other peoples’ dreams [32]. Even looking for too long at our own prompted images can feel like staring at Kate Compton’s mathematically-unique but visually indistinguishable bowls of oatmeal [5, 177].

## 2 LIQUID GENERATION

In a recent talk, Compton presented a concept that addresses this problem of unending content, which she terms “liquid art” [7]. Solid art is mostly-fixed and collectable (the aura matters); in contrast, liquid art is a space of potential artifacts [7]. Compton references the example of the composer David Cope’s 1983 project to generate music in the style of Bach [1, 9]. Cope’s Emmy was rejected precisely because it could generate more Bach than we could ever listen to in a lifetime: “Because my program was continuing to pump out music like a spigot, it became a problem of: ‘Why play this sonata and not that one?’” [1]

Compton’s term for this is a *Bach faucet*: “A Bach Faucet is a situation where a generative system makes an endless supply of some content at or above the quality of some culturally-valued original, but the endless supply of it makes it no longer rare, and thus less valuable” [6]. Compton contrasts this infinite content against the concept of Walter Benjamin’s *aura* [7]. Benjamin wasn’t just concerned with mechanical reproduction, but rather reproduction at speed—the movie camera making images at the same speed as speech [2]. With computers and generative content, this problem is raised another dimension: reproduction not only at speed, but across unending possible universes. As Compton points out, as soon as a computer can do a thing, it can do a lot of the thing. Instead of a solid, fixed artifact we have a liquid flow of potential artifacts, with no special relationship with any of the particular artifacts.

## 3 PCG IS IMPOSSIBLE

The terms of the “content arms race” imply that PCG is about replacing human-created art assets with machine-generated artifacts that are indistinguishable from what the humans would have created.<sup>2</sup> This turns out to be an impossible task. Even if we can create an

<sup>2</sup>Will Wright’s point, in that and earlier talks, was to emphasize the games we could be making if we took a wider view of the possibilities [37], so in that sense PCG has been

object that is exactly equivalent to what a human artist would have made, the knowledge that we can instantly get another one upends our relationship with the generated artifact.

Our relationship to a generated artifact is not and cannot be the same as our relationship to a handcrafted thing, because we are always aware that we could get another one. Procedural generation as a replacement for hand-made things is categorically impossible without a further transformation of our relationship to the generated artifact.

## 4 RITUALS OF TRANSFORMATION

Fortunately, rituals do exist for transforming our relationships to things—indeed, the transformational nature of rituals has sometimes been a focus of anthropology, influenced by Victor Turner’s work [20]. Of particular interest to the PCG community, videogames have a ritual connection, sometimes linked to theater [13, 16, 19].<sup>3</sup>

Compton points out that David Cope destroyed his Bach database [1]. Having performed this ritual of destruction and mortality, his generated compositions have solidified. Other, less destructive rituals are possible: Compton lists labeling landmarks, mutant shopping, and the “dead butterflies” of a gallery exhibit of fixed seeds of a random process. Even so, turning an artifact into a fully fixed solid is difficult: we know that it has been generated once, and it is often relatively easy to melt an artifact down and generate it anew. What if, instead, we were to embrace the liquid nature of the medium?

Some of Compton’s rituals acknowledge the continuity of the space. Labeling a landmark acknowledges that there is a wider field of unmarked places we are, by implication, not interested in. Breeding two images together with a genetic algorithm [33] or generative model [11] takes advantage of the fluidity of the space. Compton suggests that rather than a noun, we should treat art as a verb. PCG that engages with liquidity might look like the Scrabble-inspired game *Blabrecs*, which transforms English into a sea of possible words [24]; or Allison Parrish’s computational poetry, which applies a Gaussian filter to a poem via semantic vectors rather than visual space [28]. Another form of ritual that has a tradition in the PCG space is mixed-initiative co-creativity [39], particularly in its most active and co-creative forms.

## 5 CONCEPTUAL ART

The aesthetics of liquid art are intrinsically different from those of solid art: what is remarkable in a single artifact gets lost in an ocean of closely similar content. As we navigate this liquid ocean, there are previous navigators who might have labeled some landmarks before us: we can find them in generative art, conceptual art, and performance art. Casey Reas et al. point out that generative art is descended from and influenced by conceptual art [31, 21]. Sol LeWitt, a conceptual artist, described it as, “In conceptual art the idea or the concept is the most important part of the work. [...] The idea becomes a machine that makes the art” [25].

missing the point for two decades. There are, of course, other motivations for using PCG, including approaches that grapple with post-anthropocentric generativity [29].

<sup>3</sup>Benjamin, interestingly enough, viewed the lack of aura in mechanical reproduction as the thing that would free art from ritual [2]. Of course, we can view applying ritual to the generated as a means of bestowing an aura. In this view, generativity destroys the exhibition value but revives the cult value.

Like conceptual art, PCG and generative art are tightly linked to the *idea*. The *idea* is one way prompt writing has been approached as art rather than engineering: creating the most apt or poetic prompt, rather than esoteric but effective incantations of keywords [23]. The idea is as important as the result. In computational creativity, this has been studied as the concept of *framing* [4, 8].

While conceptual art is generally aimed at engaging directly with the idea, generativity takes the idea and manifests it in the flesh. Generative art is conceptual art except someone went and actually made the damn thing. Notably, this is not the same as a pre-conceptual solid art, precisely because generativity is liquid. Generative art extends the art across many possible worlds.

As a conceptual artist, Yōko Ono’s work overlaps with game design [12, 26], particularly *Grapefruit* [40]. She was also a performance artist, participating in what would later be called “destruction art,” with the destruction being sometimes literal and sometimes figurative [14]. Together with other performance artists Ono participated in Fluxus, an association of avant-garde artists who included John Cage [14]. Ono was also a participant in what Allan Kaprow termed “Happenings,” a broad term that included interactive performances [36, 81]. The ephemeral nature characterizes both performance art and liquid art. We can contrast Jean Tinguely’s self-destroying *Homage to New York* with David Cope’s deliberate infliction of mortality on his software.

Conceptual art has a reputation for what Dominic McIver Lopes refers to as “appreciative failure,” with audiences struggling with the effort to engage with the art. Lopes suggests that this is because conceptual art was misclassified as a plastic art—akin to the three-dimensional paintings and sculptures it was contrasted against—and that it might be better appreciated if it were regarded as a new art form [27]. Likewise, I think that today’s PCG community would benefit from approaching procedural generation as a new form of liquid art.

PCG has a unique perspective to offer as we explore this possibility space of applied aesthetics. Compared with other research areas which are building on top of generativity, we are in a better position to apply our understanding of this liquid space and have it inform our research. This includes prior research on the poetics of PCG [21], as well as drawing on our close ties to videogames, which, because of the interactivity, leads to many areas of overlap.<sup>4</sup> In regarding procedural generation as a liquid art, we can also compare it with the ongoing work to understand emergent narratives and story volumes [17]. As with generative possibility spaces, the heart of a story volume can be found in the interaction between what always happens and what never happens [22]. As Italo Calvino pointed out in “Prose and Anticombinatorics,” often the point of the work can be found in the constraints that the author imposes on it [3].

Using procedural content generation to replace hand-made content is impossible. Liquid art needs to develop its own aesthetics, which can find the cult value of anointing one out of a thousand versions of the Mona Lisa across all possible worlds, rather than being confined to the pedestrian aura of a single painting.

<sup>4</sup>Such as Wardrip-Fruin’s work on meaning-making in games [35].

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