

Reflections on making a Creative Activity Trace tool for Digital Artists

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Creative Activity Traces (CATs) allow researchers to study users' interactions with CSTs and generate broader insights about creativity. Another hope is that CST designers can leverage CATs to create tools that make use of creative activity traces as well. But what should researchers consider when designing such tools for artists? We highlight initial assumptions we held about how CATs would be used to support digital artists, how they were challenged, the resulting tool, and initial takeaways.

ACM Reference Format:

Angela Bi and Thijs Roumen. 2026. Reflections on making a Creative Activity Trace tool for Digital Artists. In *Proceedings of Herding Cats: Making Sense of Creative Activity Traces (CHI '26)*. ACM, New York, NY, USA, 5 pages. <https://doi.org/10.1145/nnnnnnn.nnnnnnn>

1 Introduction

The creation of digital software as a new creative medium has led to the rise of Creativity Support Tools (CSTs) that use computational representations to support creative tasks such as drawing [9] [14] [4], 3D modeling/printing [2] [6] [13], and design [15] [7]. In these domains, Creative Activity Traces (CATs) have allowed researchers to generate quantitative methods to study users' interactions with Creativity Support Tools (CSTs) and generate insights about creative process in general [1] [5] [11]. Another hope is that we can leverage CATs in order to support tool users in-situ.

While conceptualizing my newest project *Colorfigure*, a brush configuration interface for digital artists, my personal experience as an artist led me to grapple with questions such as: what do artists find useful to know about their own process? What sorts of measures, representations, and visualizations are important, and what roles does documentation play in artistic process? In this workshop paper, I reflect on my process in creating *Colorfigure* and highlight initial takeaways about surfacing creative activity traces to artists.

2 Making *Colorfigure*

When I initially started working on *Colorfigure*, I believed that user logs (e.g. adjusting brush width, drawing a stroke), implicitly captured by the software as the user draws, would be a unique opportunity for artists to gain insights into their own process without needing to go through the extra work of capturing or documenting their process themselves.

As soon as I started looking at user logs from my own art process and trying to design an interface around them, however, I ran into practical issues as an artist that made me question my initial beliefs. There were a large number of user logs generated over a few minutes, and they were all granular, numeric descriptions of actions such as: Set current brush diameter to 87 pixels. In my day-to-day practice as an artist, I rarely engaged with numeric or textual data; I usually made sense of my own process by creating sketches, reference images, and alternative color schemes, and storing them in hidden layers. Additionally, my experience with making art was usually an open-ended,

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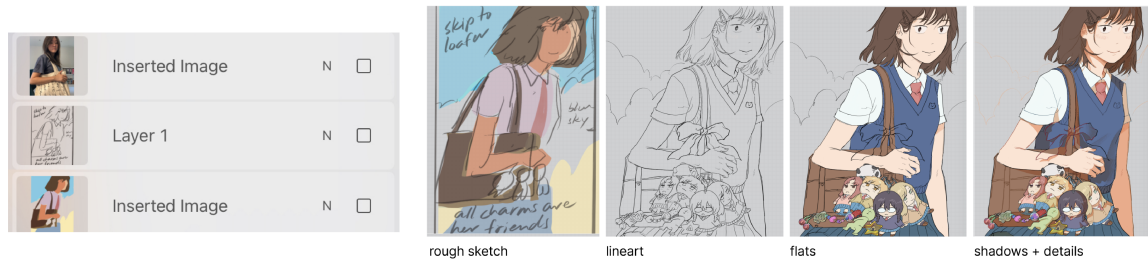


Fig. 1. An example of a personal artwork, where I stored reference images and thumbnail sketches in hidden layers.

unconstrained task—oftentimes, changing and adjusting brushes felt more analogous to "mixing the right color," where no optimal color will lead to the "best" drawing, and using the same color as another artist won't lead to the same outcome.

Seeking to design an interface that represented creative activity to the user in a way that addressed these concerns, I came up with a list of ideas for tools that artists could use to document their creative process. For one of my ideas, I took my analogy of "mixing colors" literally—if the process of navigating brush parameters was a seemingly analogous practice to mixing colors, what would it look like if we allowed users to create, modify, and save brush configurations as *watercolor paintings*? We wanted to see how a more artistic representation of brush parameters would change the way they configured brushes and conceived of their creative process.

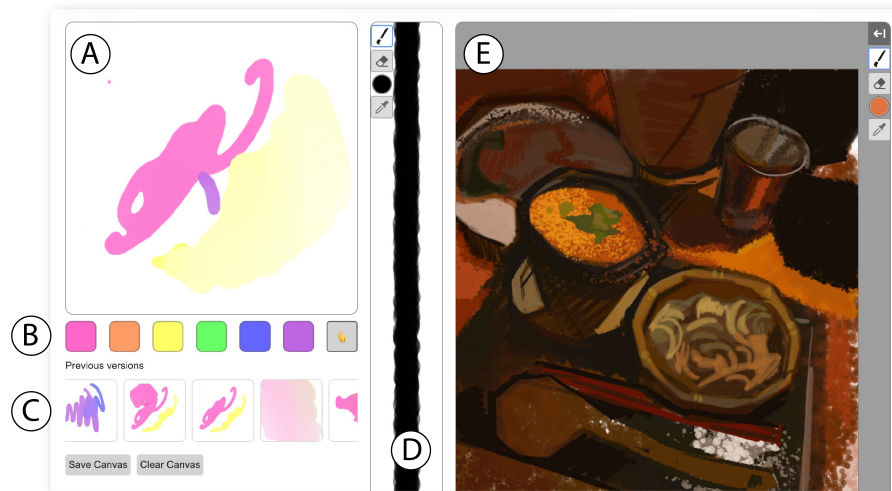


Fig. 2. The tool, *Colorfigure*, which consists of the watercolor configuration interface (A, B, C), a brush preview (D) and the drawing software (E). In the configuration interface, the user selects colors (B) and paints them onto a watercolor canvas (A), which influence the parameters of the brush that the user uses in (E). The user can save versions of brush configurations in (C), and view a continuously updating preview of the changing brush in (D).

Our final tool, *Colorfigure*, is a canvas-based brush configuration interface that allows users to modify their brush parameters by adding colors and smudging them together on a configuration canvas. Adding a "primary" color is associated with adjusting parameter(s) in a specific direction, and smudging does the opposite. In our implementation,

pink is mapped to brush thickness, yellow is mapped to brush opacity, blue is mapped to brush scatter. For example, a user would add pink to the configuration canvas to increase brush width and smudging the pink out to decrease brush width. The palette also includes other "secondary" colors such as orange, green, and purple, which influence a combination of brush parameters—for example, adding purple increases both brush thickness and scatter.

3 Self Study

After I developed *Colorfigure*, I used the tool for around an hour and reflected on my experience—this led to additional insights about what supporting materiality in configuration might mean.

In the beginning, it took a while to learn the mappings between specific colors and their corresponding brush parameters—in order to learn the mappings, I experimented by adding a random color, seeing its effect, erasing the canvas, and restarting with another color. I experimented with random colors, adding orange, blue, and green onto the configuration canvas in random areas; after adding each color and observing the resulting brush, I either decided to clear my canvas and restart, or found the outcome interesting and decided to draw with it.

Once I developed a tactical understanding of the mappings between colors and brush parameters, this allowed me to experiment with the intricacies of the watercolor canvas and develop an intuition for brush configuration as a whole. While experimenting with adding colors, I realized that adding pink on top of yellow would not only increase size, but it would also decrease the impact of the yellow. I applied this to smudging, where I found out I could smudge two colors at once and influence both of their corresponding brush parameters. This made it so that I could experiment with multiple brush parameters at a time, using my tactile experience to intuitively navigate the brush's configuration space as a whole.

There was one particular brush configuration, the product of a pink and yellow squiggle, that I particularly enjoyed. I continued to save variations of it, sometimes adding bits of colors or smudging sections out. Looking back at my gallery of previously saved canvases, it became easy for me to visually identify which canvases corresponded to which brushes I liked, and also see how my brush configurations progressed throughout my process of drawing.



Fig. 3. How my favorite brush evolved as I modified it throughout my drawing process

4 Initial Takeaways

My experiences designing the tool and using it to create art led me to think about potential takeaways from using the tool in broader connection to theories about creativity and existing literature on the role of documentation for artists.

4.1 Brush configuration as material

Ingold argues that what makes artistic practice creative is that the artist "[joins] with and [follows] the forces and flows of material that bring the form of the work into being" [8]. In drawing, for example, the mark on paper "*leads as much*

157 *as it is led*: it loops inward from the paper to direct the artist's decision concerning the line that is next to be drawn, and
158 loops back out, as a new trace on paper, *sewing* the mind into the line" [3].

159 Existing representations of brush parameters such as sliders are a tool to communicate the artist's "intentions" to the
160 drawing software as efficiently as possible. However, this representation assumes that the only role of an artist is to
161 "lead" brush configurations and not to "be led" by them. If we agree with Ingold that an artist's ability to "be led" by our
162 materials/tools are inseparable from artistic practice, representing brush configurations as numerical parameters to the
163 artist misses an important part of the user's artistic process.

164 While using *Colorfigure*, on the other hand, I felt that the watercolor canvas representation changed my relationship
165 with brush configurations. Instead of dragging a slider, I was able to reason about them in a much richer, material
166 dimension.

170 4.2 Documentation as reference to first-hand experience

171 Moradi et al. [10] and Sterman et al. [12] studied expert creative practitioners and found that first-hand experience was
172 crucial for the usefulness of documentation. In "Towards Creative Version Control," Sterman et al. [12] talk to a creative
173 practitioners, including tapestry weaver and programmers who work with creative code. Versions that the tapestry
174 weaver and New Media Artist created consisted of the actual intermediate artifacts, and directly encode their first-hand
175 experience in making it. In "Glaze Epochs," Moradi et al. [10] noted how skilled ceramicists generated a wide variety of
176 records such as sketches, annotations, and collections of glaze keys, but that the record served "primarily to capture a
177 moment in time and to attest to its occurrence" [10].

178 Reflecting on my experience using *Colorfigure* canvases, I might use a similar quote—by pointing to a specific canvas
179 I had saved, it became easier to show and talk about how I changed my brushes. Not only was it visually obvious if
180 canvases were related, and how one canvas was a modified version of the other, but since I had drawn the configuration
181 canvases myself, the tactile nature of the configuration canvas made it easy to look back at previous canvases and
182 remember what I was doing at the time.

187 5 Concluding Thoughts

188 Through engaging with the design process and using the tool as an artist, I've been able to reflect on how *Colorfigure*
189 changed my relationship with brush configurations. In an upcoming user study with expert traditional and digital
190 artists, I hope to gain deeper insights about how documentation and configuration tools might be most valuable to
191 artists.

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Received 20 February 2007; revised 12 March 2009; accepted 5 June 2009