

State of the Art(tist): Towards an Artistic User Model in Creative Activity Traces

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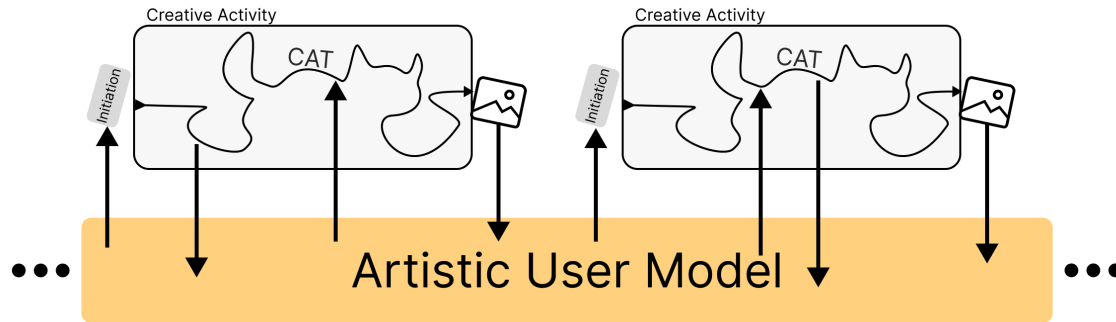


Fig. 1. Current work in creative activity tracing focuses on single activities. To properly understand how these activities are initiated, the use of created artifacts, and how one activity influences another, we propose a shared Artistic User Model.

To help bridge gaps between different Creative Activity Traces (CATs), we spotlight a convention in Art Theory: one’s creative practice is the iterative shaping of one’s artistic identity. We draw insight from motivational science to characterize this iterative process as the shaping of the artist’s BEATs (Beliefs, Emotions, Action Tendencies). We argue, on top of current CATs, iteratively refining an Artistic User Model (AUM) to trace the artist’s motivational process during creation and across projects. Doing so would allow us to study creativity and CSTs beyond mere production and workflow support. We propose taking inspiration from recent work on General User Modeling and natural-language-based tracing tools as a method for designing such an artistic user model.

CCS Concepts: • **Human-centered computing** → **Visualization techniques**; • **Applied computing** → **Arts and humanities**.

Additional Key Words and Phrases: Creativity Support Tools, Visualization

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1 INTRODUCTION

Current work around Creative Activity Traces has made useful contributions to recording, interpreting, and utilizing artist strategies in numerous creative fields. However, it has largely overlooked a convention in Art: the creative practice is neither the artifact nor the process, but the iterative shaping of the artist’s artistic identity [3–5, 7]. Focusing on

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53 single instances of creative activity narrows the framing to specific goals as inputs, and immediate artifacts as output.
54 While this scope is actionable, and often sufficient, to explain activity in a single creative project, it cannot capture how
55 an artist’s prior history might guide their actions in a project, and how their experience with one creative activity might
56 influence their actions down the line. To better denote this longitudinal between-projects aspect of creative activity, a
57 new approach is required.

59 We draw insight from motivational science to characterize creative practice as an iterative shaping of the artist’s
60 BEATs (Beliefs, Emotions, Action Tendencies). We propose capturing and iteratively refining an Artistic User Model
61 (AUM) that traces the artist’s BEATs, drawing connections to existing work on General User Models (GUMs) and
62 visualization/pattern-finding CAT techniques. We hope to inspire new conversations in the CATs community towards
63 CAT techniques that explore beyond mere artifact-production, short-term task execution, and workflow support; and
64 help us understand CATs as a longitudinal, motivational process—how artist beliefs, emotions, and action tendencies
65 reorganize over time.
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67

69 2 RELATED WORK

70 Creative activities often generalize beyond any one medium or software program, and prior CAT research has used these
71 commonalities (such as natural language [11] and version control [12]) to form traces in different contexts. Outside
72 of activity traces, lifting abstractions from creative activities have been used in support tools [14], and the process
73 of this lifting has been shown to be achievable by an algorithm [13]. Following this same logic, we identify a shared
74 feature among all creative activities—the artist’s BEATs—and propose that these too can be traced and leveraged in CAT
75 research.
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78 In motivation science, Dweck proposes that as people pursue need-fulfilling goals, they form mental representations
79 (BEATs) of their experiences: **B**eliefs about how the world works, representations of **E**motions encoded from past
80 goal pursuit, and one’s **A**ction **T**endencies. These BEATs guide goal selection and pursuit, in constant interplay with
81 the moment-to-moment experience of doing [6]. Creative activity is a paradigmatic case of this loop: two artists
82 starting from the same blank canvas will diverge based on their BEATs—one whose BEATs encode belief in accurate
83 representation, calmness from rendering landscapes, and observational tendencies might paint realistic scenery from
84 reference photos; another whose BEATs encode painting as emotional outlet, satisfaction from contrasting color, and
85 tendencies for big arm motions might begin non-representationally in red and green. Their experiences during painting
86 will in turn update those BEATs: a realist painter who discovers that atmospheric perspective resolves a depth problem
87 encodes that insight as a refined belief—shaping how they approach the next canvas.
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90 BEATs relate to prior constructs like schemas [13], but are broader in scope. Schemas capture the more articulable,
91 rationalized conventions of a specific medium—such as chord progressions in music composition. BEATs additionally
92 encompass beliefs about those schemas, alongside emotions and action tendencies—all three of which can lead an artist
93 to follow a schema or break from it.
94

95 This iterative shaping of the artist, behind a finished artifact, beyond any single session, is widely understood as the
96 core of creative practice within Art Theory. Cohen states this most directly: “the artist uses art to modify the artist
97 who uses art to modify...”, a recursion in which making yourself is the core of art [3]. Dewey argues that making
98 reorganizes the artist’s inner life: images, memories, emotions, and ideas are transformed through engagement with
99 the medium, leaving the artist with a restructured understanding of what she is doing and why [5]. Collingwood
100 narrows this to emotion: the act of expression is an exploration, not a report, because the artist does not know what
101 emotion she is expressing until she has expressed it—making brings an inner state to consciousness in a form it did
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not previously have [4]. Merleau-Ponty extends this to action tendencies: painting continuously reforms the painter’s way of seeing, such that perception itself is reshaped through the act of making [7]. Schön, analyzing the architectural design studio as a paradigm of professional learning, describes the same loop in epistemological terms: the practitioner’s knowing-in-action is continuously reshaped through reflection-in-action, as each act generates new framings that update how the next act begins [8, 9]. Art theory, phenomenology, and practice theory converge on the same claim: across beliefs, emotions, and action tendencies, making iteratively reshapes the artist—a self-modifying loop that CAT research has yet to engage with.

3 MODELING BEATS ALONG WITH CATS

Consider the act of reproducing a painting in an art study. The artifact created by this activity (the reproduction) is secondary in importance to what the artist learns by performing the reproduction. A CAT limited to the activity itself (say, by reporting which parts of the painting were focused on over time) would be insufficient to answer some basic questions. Why is the user focusing on some feature? This requires information on what skills they had going into the practice. For example, a CAT would show that the user is repeatedly jumping between painting the foreground and background, but not that they’re doing so to experiment with atmospheric perspective. Was the practice successful in improving some skill? This requires information on how the artist acted after the activity ended. Similar effects are present to some degree in any creative activity. For instance, in many creative activities the user begins with some high level goal (e.g. “Create a dungeon level” [2], “Find art pieces that match a theme” [1]). A trace focusing on a single activity might contain information on how this goal was refined, but necessarily won’t contain information on how the goal was initially formed, since temporally this happened before beginning the activity. To approach such questions, some model is needed that captures the state of the artist prior to the creative activity, and how that state is changed by the activity throughout and after the activity.

We propose BEATs as a baseline for this Artistic User Model. Since it describes human motivation and actions in general, it’s a good starting ground to describe artistic motivations and actions. Capturing an artist’s BEATs is an open challenge, as it requires interpreting actions across (and between) multiple creative activities. Recent work on General User Models tackles a similar issue (inferring latent traits about the user from observable heterogeneous user activities) by capturing screenshots and encoding user state in natural language [10]. It’s possible that additional structure can be inferred from the BEATs framework, but recent work is already exploring tracing and understanding natural language [11, 15]. The GUM community itself has been actively experimenting with using LLM and human-in-the-loop interactions grounded in Activity Theory to directly infer user goals/values/objectives from low-level activities.

To better capture a creative activity, we need traces for both the observable actions (which most existing CATs focuses on) as well as the latent motivational structure. Along with CATs, we propose capturing and iteratively refining an Artistic User Model (AUM) that traces the artist’s BEATs during creation and across projects. Doing so could allow us to:

- (1) design CSTs that augment BEATs beyond mere production and workflow support
- (2) understand CATs as a motivational process/evolution
- (3) understand how artist beliefs, emotions, and action tendencies reorganize over time
- (4) identify patterns linking internal states to creative decisions and development trajectories

We welcome a discussion about AUMs in this workshop, and believe this is a timely conversation to have. The broad applications of AUMs promise to provide some insight into most CAT domains. Conversely, any implementation of an

AUM will be useful largely as a function of how many different CAT systems it can communicate with. We hope to begin a discussion of the conventions and protocols needed for an AUM to interface with a wide variety of creative activities.

4 CONCLUSION

We propose that an Artistic User Model can help bridge gaps between different creative activity traces, and can explain the initialization and effect of creative activities over a longitudinal context. We give examples of relevant questions an AUM could help answer, and why BEATs form a useful psychological basis on which to base AUMs. We explore General User Models as a potential source of inspiration for AUM construction, and welcome further discussion in this workshop.

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