Co-herding CATs: Participatory Living Lab for CATs Analysis

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1 Introduction

In recent years, creative collaboration is often split between physical workspaces and digital environments, like Figma and Miro. This transition to digital spaces means that we can observe digital residues, or traces, created by the conversation between the creator and their medium, rather than just the finished design. In the current HCI literature, creativity support tools are often studied in controlled settings for shorter periods [7, 8, 12]which means we do not know how they generalize to real world creative collaboration. Meanwhile, studies that use digital traces as the primary data source, analyze them without including trace contributors in the analysis process, leaving much of the observable interpretation solely upto the researchers; leading to biased insights [11, 17] and similar generalization issues. We believe that a new kind of mixed-methods approach must be developed to better understand the nuances of creative workflows.

In this position paper, we propose a methodology that combines *Living Labs (LLs)* and *Participatory Design (PD)*. LLs are an approach to studying systems and phenomena in their natural settings[1]. They can be used to examine digital traces in situ, without eliminating the messiness of the real world. On the other hand, PD is a way of involving users of a system as decision makers alongside designers, in the design process of the system[13]. A PD approach to analysis can be used to frame *creative activity traces (CATs)* as probes for co-analysis sessions rather than isolated data streams.

We discuss five challenges about CATs analysis and propose an open question for each challenge.

2 Background

We build upon prior approaches to Living Labs and Participatory Design.

2.1 Living Labs

According to Alavi et al. [1], LLs can be 1) Artificial, sensor-embedded environments where participants are hosted, 2) Natural, sensor-embedded environments where participants reside, 3) Natural environments temporarily monitored for a specific study, 4) Participants carrying activity-data collection tools like wearables or phones in changing environments, 5) Workshop environments tailored for co-creation or feedback sessions. All LL types support collection of multimodal activity traces to study creative collaboration.

2.2 Participatory Design

Unlike traditional user-centered design approaches where the users are involved either as passive sources of data or for evaluation of the system, Participatory Design posits that users of a system should have a descisive role in its creation [13]. Also known as cooperative design [3], the Participatory approach is built on the pillars of 1) mutual learning, 2) alternative futures 3) artifact ecologies 4) empowerment and mediation, and 5) emancipatory pratices and democracy [4]. These prillars translate to use of methods like participatory sensing [14], co-mapping data journeys[2] and autobiographical memory reconstruction[10] with contributors of CATs during data collection and analysis.

3 Co-herding CATs

We propose a mixed-methods approach, which we refer to as *Co-herding CATs*, combining Living Lab and Participatory Design approaches to iterate on an AI-powered, trace-based meeting tool and study collaborative creativity through it, with the intent to augment people's creative abilities.

3.1 An AI-powered Meeting Tool for Collaborative Creativity

Our team is developing an AI-powered, interaction-history based creativity support tool that has nudged us to leverage CATS- for both prototype improvements and understanding creativity in action. The prototype is unique in its capability to provide interaction activity traces as context to an artificial intelligence model that users can prompt. It is also capable of surfacing trace history to the users for specific purposes. The tool has the potential to become a mainstream for AI powered creative collaboration and we hypothesize that it will catalyze team creativity overtime. Therefore, we are interested in studying CATS generated by user interaction with AI such as prompts and use of AI features within this tool, alongside traditional CATS.

3.2 A Living Lab for CATs

Human-computer interaction (HCI) research rarely examines creativity and the use of creativity support tools in natural environments [7, 8, 12]. This contrasts with the established impacts of the spatial, temporal, and socio-technical aspects of collaborative creativity[6], which are difficult to measure in controlled settings over shorter timeframes. We believe that LLs are a potent way to longitudinally study creative collaboration in vivo. The third strand of LLs as described by Alvi et. al [1] above, is applicable to using CATs from our new tool to inform its design iterations and for studying creativity. We will deploy a methodology similar to Yang et. al.'s study of hybrid collaboration habits through emails, calendars, instant messages, video/audio calls and workweek hours [16] and Ferguson et.al's studies on investigating gendered language patterns through Slack messages of student design teams [5]. Our

stakeholders will be hybrid startup teams and hybrid teams at a mid to large size company who regularly engage in creative teamwork.

3.3 Participatory Approach with CATs

Our inspiration for analyzing CATs from LL studies comes from the three stages of process science; discovery, explanation, and intervention [15]. We start with the discovery stage; processes are captured and data sources are identified. We gather a combination of CATs and peoples' accounts of their experience in doing creative work before, after and while using our tool. The two data sources together will likely paint a close to complete picture of the creative workflows. Our ultimate goal is to make it easier for people to collaborate iteratively across the creative process, using interventions grounded in real-world collaborative work. The most challenging stage of the methodology sits between discovery and intervention: explanation. The explanation stage is about understanding when, how and why the creative activity unfolds when people use our tool. This stage will be particularly challenging in the context of creative collaboration because of (i) the complexity of the process and (ii) use of AI in it.

3.3.1 Complexity of the Process. Firstly, it is very likely that what we learn about creative activity from CATs is incomplete or different from the qualitative experience of the people involved in it. These interpretations, based on limited data can be unintentionally biased [11], discriminatory and can have both positive and negative outcomes, often simultaneously [17]. Additionally, when CATs represent intra- and interpersonal creative approaches, representational inaccuracy exacerbates questions about ideas, decisions and ownership.

3.3.2 Use of AI. Secondly, in our tool and other mainstream creativity support tools, AI generates entire blocks of an idea (e.g., "Make me a header for my landing page"). We lose the "Edit Wear" [9]t hat reveals the back and forth leading up to the design rationale. At this point, we start deciphering a trace of a trace; making the observable data point fuzzier.

We believe that the proposed Co-herding CATs approach will bridge the gap between CATs interpretation and creative work realities.

4 Five Challenges

Here are the five challenges of using CATs as one of the primary data sources in our Co-herding CATs approach.

4.1 Fragmented Sources

Creative work is siloed across meeting discussions in Zoom, "aha" moments at home, online work on Miro, and documentation in Docs. It becomes difficult to track an idea from its conception to implementation to propose improvements in creative workflows. *How do we make sense of and utilize fragmented CATs to inform creative tool enhancements?*

4.2 Granularity of Analysis

Assuming we have access to temporal layers of interaction through CATs, the tradeoff between levels of granularity for analysis is inevitable. Fine-grained CATs will be abundant and could give us a statistically meaningful insight into the activity. However, the chances of misinterpreting the thought behind an action is also highly likely because we have the ability to identify more patterns even if we're not sure of how realistic these patterns are. On the other hand, if we choose to analyse coarsely, we might rely more on reasoning signals like AI-prompts and context rich actions like deleting a sticky note, leading to biased insights of how people think versus what they would do to achieve the desired outcome. For instance, people might revisit and reference a deleted sticky note idea even though they discarded it previously. It is highly likely that this action is overlooked in a coarse grained analysis where focus might be on linear events. Fine grained circular events that paint a richer picture when observed together, get lost in the process. *How can we strike the right balance between coarse- and fine-grained CATs analysis and liner and circular analysis for most ecologically valid insights?*

4.3 Continuum of Informativeness

All CATs are not equally informative. We propose distinguishing between *thick CATs*, like adding a sticky note on a digital whiteboard or detaching a design component in a design tool like Figma, which show the creator's intent, engagement, creative friction or cognitive load, and *thin CATs* like logs that only confirm presence. *What are the parameters to differentiate between thick and thin CATs when deciding what is a useful indicator of creativity in action and what to disregard?*

4.4 AI Prompts as Thick CATs

Traditionally, analyses focus on what people did with a system, but AI prompts are a window into their reasoning. The prompt-based CATs in our tool can reveal the users' implicit knowledge, insecurities, and frustrations. With a probabilistic model for a teammate, a practitioner will let their guard down and becomes an active participant, like two colleagues having a conversation. *As the context of creative work changes with AI-enabled creative processes, what kind of top down or bottom up analysis framework will lead to insights on and for reflective creative effort?*

4.5 When and How to PD

Creativity is about the future, but CATs are timestamps of the past. While we may be able to identify patterns that signal creativity, it is not straightforward to predict the entropy of "Aha!" moments by simply analyzing CATs. Insights from CATs that are materialized in isolation of human insight, will remain incomplete at best and false at worst. *If we want to involve people behind the traces in sensemaking, when and how do we bring them into the analysis process? How might we get people involved in the iteration of our interaction-history based tool?*

5 Final Remarks

We look forward to discussing the challenges of Co-herding CATs and finding answers to our open questions in the *Hearding CATs Workshop* at *CHI 2026*.

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