

# Creativity support research "in the wild" for the development of human-centered AI

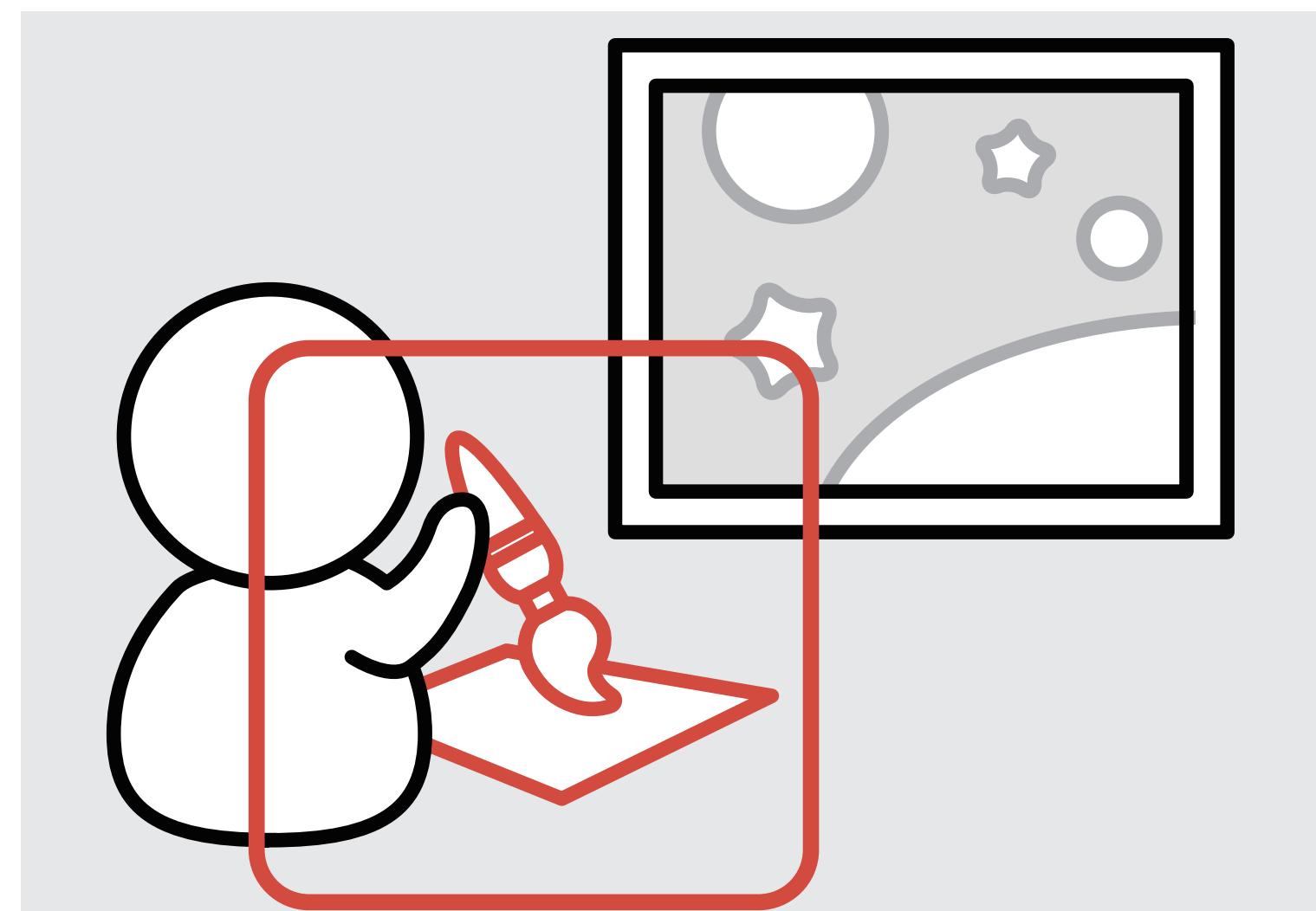
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## Background



**Creativity support tools (CSTs)**, including AI-based tools, support people's creative activities.

Creativity support has been identified as one of the grand challenges in Human-Computer Interaction (HCI) research [1].

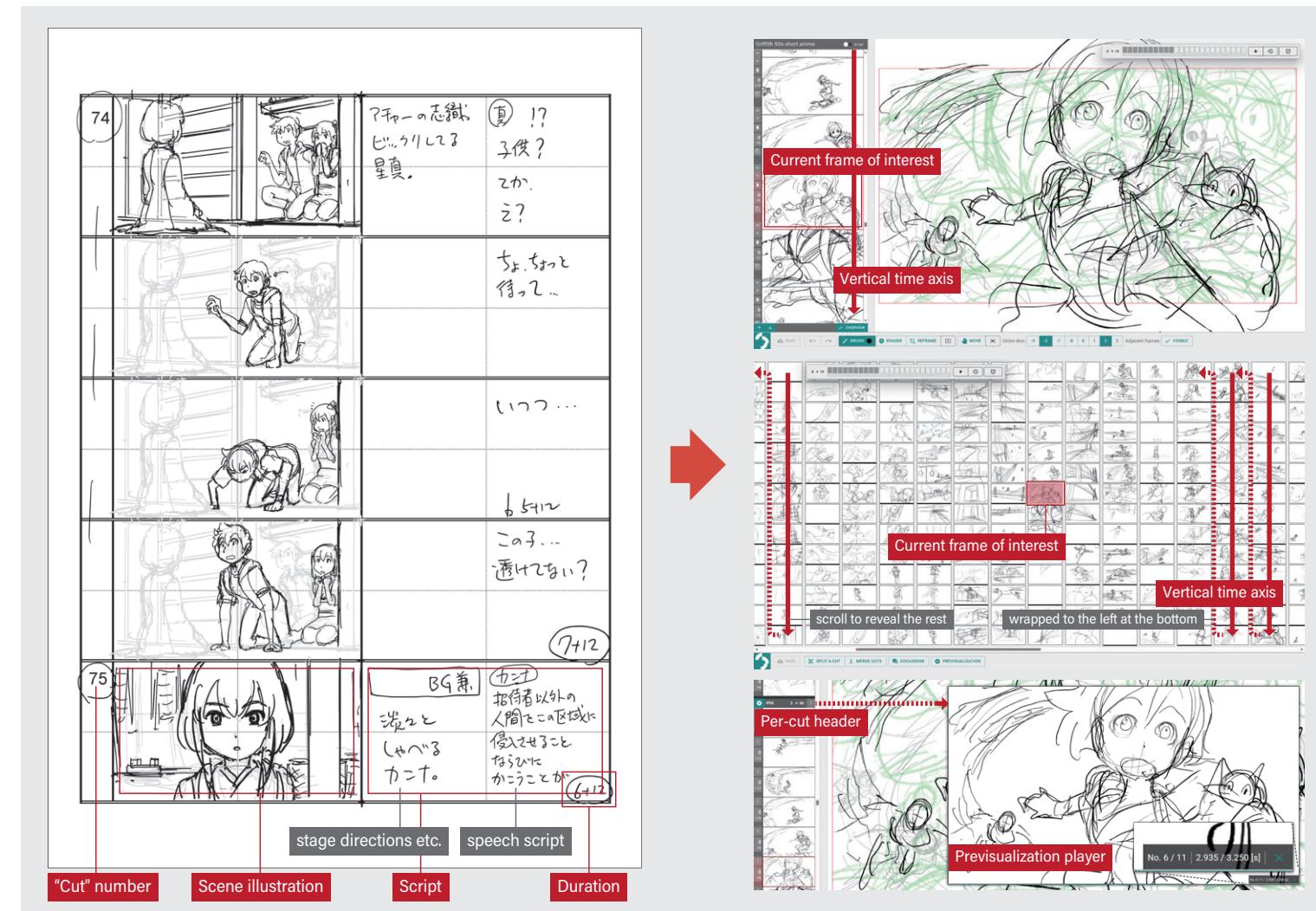
To realize human-centered AI systems, what can we learn from research on CSTs?

## ① Creativity over economy

Creative products can enrich society through discoveries, artifacts, and experiences, which are measured beyond economic impact [1, 2, 3].

CSTs inherently embody power dynamics, as the tool design may constrain creativity [4]; thus, the CST landscape should not be optimized through a capitalist framework.

## ② Cultural background matters



Technologies are always developed under a particular cultural context. However, current research is heavily biased toward WEIRD (Western, Educated, Industrialized, Rich, and Democratic) population [5], often criticized to have a colonial, universalizing impulse [6].

This cultural bias limits the field because the resulting systems only fit majority workflows, while overlooking opportunities to derive generalizable insights from minority contexts. As a counter example, our study of a storyboard tool highlighted the benefits of vertical timelines in anime storyboards, a feature with broader applicability, and contributed to a diverse CST landscape [7].

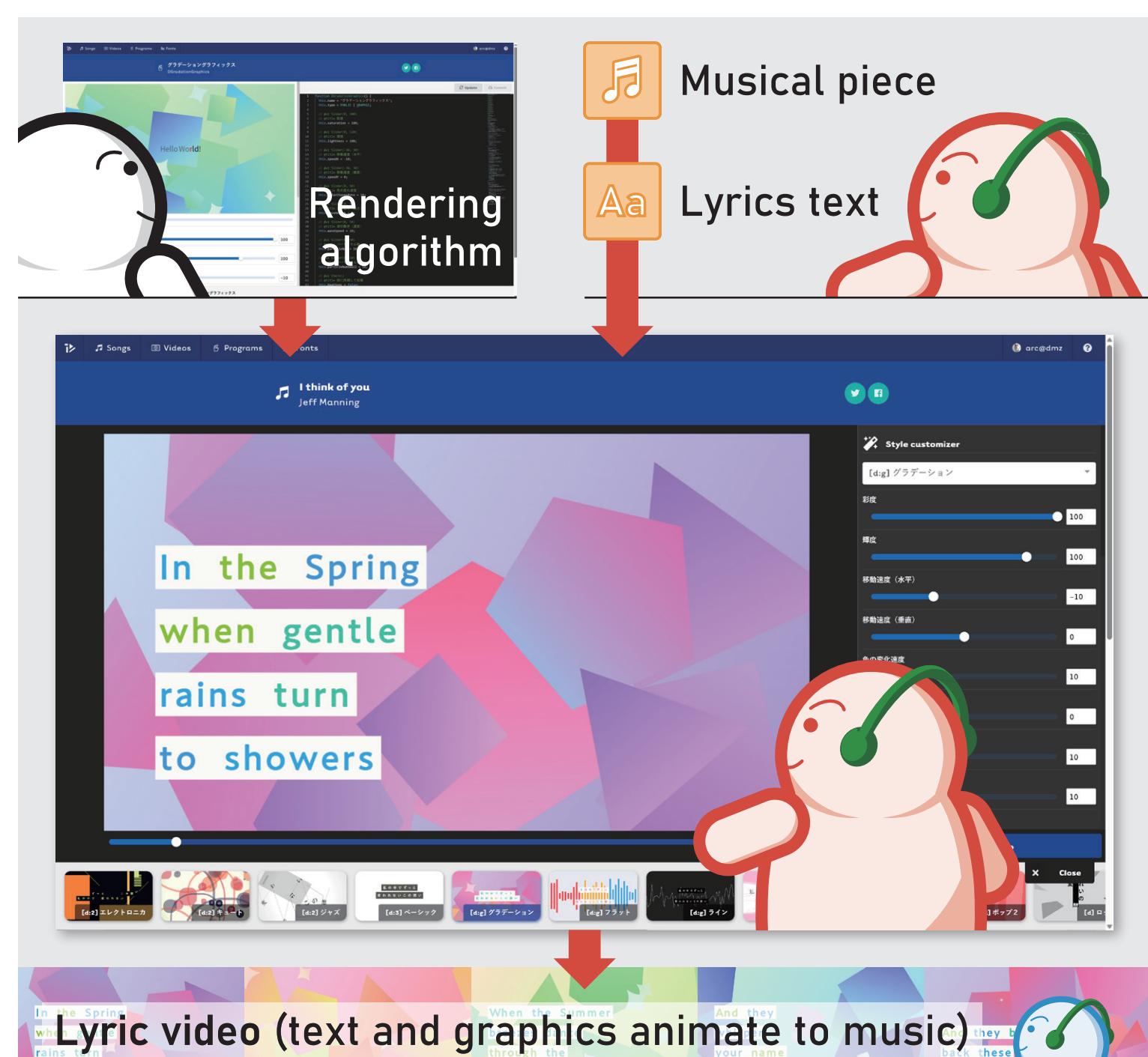
## ③ Creativity, not necessarily efficiency



Many creative activities are open-ended, with goals that are initially unknown. As a result, high-level automation is often avoided, and a manual, exploratory process is preferred [8]. Our study of a storyboard tool supports this insight, as users favored features for low-level productivity support (e.g., undo and redo) and for exploratory actions (e.g., an interface for a quick overview of the entire storyboard content) [7].

Computational support, including AI-based capabilities, should augment rather than replace human action. Long-term user observations and collaborations help avoid "cherry-picking" user problems [9].

## ④ Co-adaptation between people and technologies

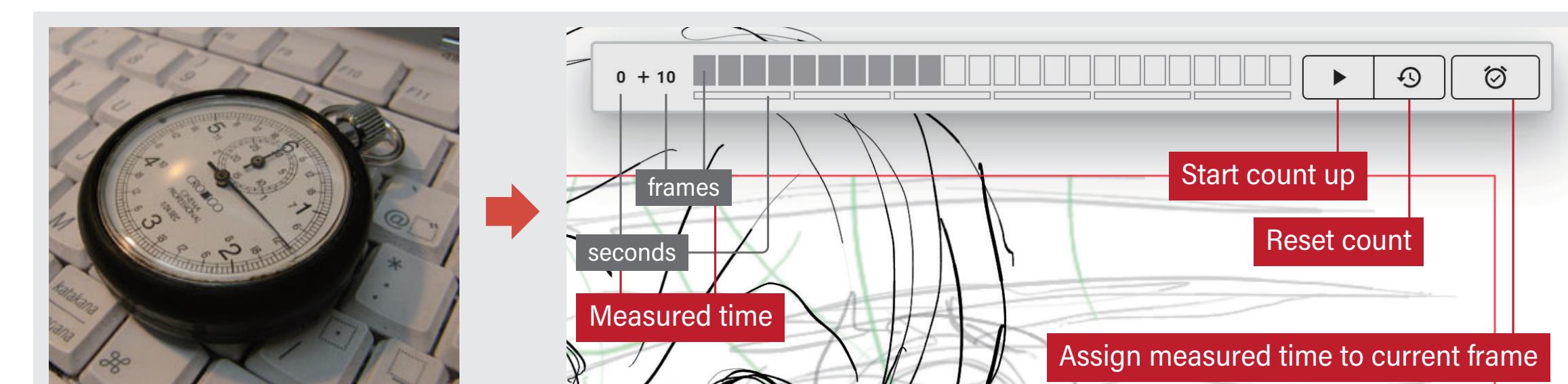


People get used to and influenced by tools, and tools should adapt to their use [10]. It is important to acknowledge their social behavior is heavily affected by tool design.

For example, our music video authoring tool allows programmers and users to share the same environment, so the tool can co-evolve with people, unlike a typical authoring tool that can only be extended by "plug-ins" developed outside the environment [11].

In addition to the socio-technical perspective, there is still room for technical theories of tools, namely "instrumental interaction" [12].

For instance, a storyboard tool implements a pen tool and other tools such as stopwatches, where tool-to-tool interaction design is non-trivial [7].



## ⑤ Symbiotic ecosystem of people, creativity support tools, and creative artifact



Creativity and culture are intertwined: the former uses the signs and tools made available by the latter to produce new cultural resources that go on to facilitate future creative acts [13]. Thus, it is important to focus not only on the direct outcomes of CSTs, but to take a more holistic view of the ecosystem.

Our work in proposing a novel interactive media format, which we call "lyric apps [14]" has not only provided technical contributions, but has also reported on their use "in the wild" in a longitudinal study. We believe that we should acknowledge our responsibility for how technologies are used in society.

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