Tracking Creativity Traces in Game Jams and Hackathons

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Game jams and hackathons are multifaceted and time-bounded events, which requires participants to respond to a challenge or theme in a creative way, for instance by building a novel prototype or game. Thus, these events are interesting cases for tracking and exploring traces of creativity, and in this position paper, I present one example of how this may be done at scale: We analysed meta-data from hackathon project descriptions and explored patterns of what could be considered as creative projects. Based on the example, I discuss how we might track creativity traces in game jams and hackathons.

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1 Introduction

In this position paper, we discuss the example of a large-scale study conducted in [3] by Falk & Chen et al. For the study, we explored metadata of hackathon projects, including participants' own descriptions of their exploratory prototypes. The study explored the following research questions:

RQ1: How can we define and implement an analysis of creativity in a way that enables large-scale analysis of creativity within hackathon projects?

RQ2: What insights into participants, collaboration patterns, and hackathon setups can we gain from analyzing a large number of creative hackathon projects, and how do these insights relate to fostering creativity?

RQ3: How might LLMs be used to augment large-scale evaluations of creative hackathon projects?

To start exploring these research questions, we first had to operationalize the notion of creativity. Specifically, we attempted to operationalize the concepts of *novelty* and *usefulness* to create a subset of creative projects. To create the operationalization for our analysis, we took as a point of departure Plucker, Beghetto, and Dow's standard definition of creativity, which is based on a cross-disciplinary review of how peer-reviewed business, education, psychology, and creativity journal articles evaluated the term creativity:

> "Creativity is the **interaction** among **aptitude**, **process**, and **environment** by which an individual or group produces a **perceptible product** that is both **novel** and **useful** as defined within a social context" [9]

Based on this, we then conducted statistical analysis on this subset of creative projects to identify patterns in the interaction of aptitude, process and environment, a contribution which we framed as particularly valuable for researchers and practitioners who organize hackathons and wish to support hackathon participants' creativity and increase the

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potential for creative outcomes [3]. Such large-scale exploration of creativity in hackathons may contribute to a greater understanding of how creativity manifests in hackathons as well as game jams, which we argue contributes to moving large-scale creativity evaluation towards real-world relevant scenarios with high validity. However, operationalizing creativity itself is challenging, and the study discusses several limitations of the approach.

1.1 Hackathons and Game Jams

Reacting *quickly* to rapid changes in society and technology development is generally considered a prerequisite for innovation [12]. For this reason, hackathons have become a popular format for accelerating people's creativity and developing creative ideas, prototypes, products, or services in a variety of contexts such as education [14], entrepreneurship [8], corporations [11], scientific communities [7], civic engagement [13] and others [5]. Hackathons are time-bounded, participant-driven design events that often span only a few days, during which participants form teams and collaborate on projects to address a common theme or challenge, resulting in a perceptible outcome, such as an interactive prototype [4]. A game jam can be described as a type of hackathon focused on game design. These events are often celebrated for their potential for creative outcomes, see e.g. [1, 2, 6, 10, 15]. For this reason, hackathons have become an attractive approach for entrepreneurs, companies, educators, and researchers to develop creative solutions to problems they face or to complement or enhance their existing innovation processes [5].

In our study [3], we focused our efforts on databases that host descriptions and metadata of created hackathon prototypes, i.e., we did not study the prototypes themselves directly. Rather, the study explored creators' own representations of those prototypes, such as their own description of the prototype. In the following sub-section, we propose future directions for how to further track and explore these specific traces.

1.2 Operationalizing Metadata for Hackathons and Game Jams

In order to track and research creativity traces, we are planning to pursue the following research directions:

Artefact properties and attributes themselves can be framed as interesting creativity traces to be tracked and analysed. This could, for instance, be creator-produced descriptions of a hackathon or game jam project, or version history if a GitHub repository is included. While these traces are not necessarily directly related to a hackathon or game jam prototype itself (like an .exe file), we believe they still tell interesting second-hand stories about those prototypes, created during the often intense time pressure of a hackathon or game jam. Additionally, researchers could also consider organizing hackathons or game jams, and prepare structured ways of capturing meta-data before the event takes place. An idea could be to have hackathon or game jam participants "pre-register" their projects – either before or during the events – so that researchers not only have access to the final representation of the ideas but also to an early version. This could provide insights into how ideas develop over time.

Thematic constraints imposed by hackathon and game jam events provide interesting experimental settings for measuring divergence. While we used embedding similarity in recent work to measure the semantic relevance of hackathon project descriptions to the hackathon requirements [3], we propose exploring this further with other techniques that can gauge the semantic nuances of the textual descriptions.

Communities and people create certain metadata when they interact with specific artefacts, like the creator-produced hackathon or game jam project descriptions. Examples could be comments or ratings by others on these artefacts. Tracking and exploring artefact metadata can contribute to understanding how communities' and people's interaction patterns may be framed as creativity traces. Such interaction-based metadata could serve as signals engagement within the community. For example, we leveraged the likes from conversations on hackathon project webpages and

the “like” and “star” counts of the associated GitHub pages as proxies for popularity in our recent work [3]. Sentiment analysis of forum discussions could, for example, serve as an indicator of popularity and novelty to some extent.

2 Future work

While a large-scale data analysis can provide interesting insights into some creative patterns – defined by operationalizing aspects of creativity – it also has its limits [3]. However, we believe that participant-produced metadata of artefacts during the intense pressure of hackathon and game jam formats are valuable research subjects for exploring creativity under these conditions. Future work could move beyond artefact analyses towards a broader research landscape that integrates various aspects of metadata, including the properties and attributes of the artefacts themselves, as well as afterlife distribution and interaction traces from participants and communities.

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