# Distributed Creativity

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## Abstract
We believe that existing models of creativity do not adequately address the distribution of the range of creative acts across individuals in the collaborative creation of media in online environments. In particular we emphasize the fluid nature of users' transitions between the creative roles of *synthesizer*, *analyzer*, and *viewer* at different phases of production in online video remixing. We illustrate our position with qualitative data describing video remixing processes in the online community Jumpcut.

## Introduction
*Definitions*
Notions of creativity run the gamut from grandiose descriptions of novel acts which fundamentally change a given domain, to smaller scale novel or original acts involved in day-to-day problem-solving activity [1, 9]. Much like Fischer *et al.* [4], in this paper we are concerned with the everyday process of creativity in reference to individuals and social communities—best understood as a notion of *psychological creativity*—which every individual has.

Shneiderman [9] argues that software can best support creativity geared toward *evolutionary* advancement within a paradigm, as opposed to *revolutionary* creativity—world-changing innovations—or *impromptu* or *personal* creativity encountered in everyday life. Our

Perspectives on Creativity from [9]

*Inspirationalists* emphasize the importance of preparing the mind for a breakthrough "Aha!" or "Eureka!" moment to occur. They hold that substantial hard work and effort lays out a path for insight and illumination to follow. Inspirationalists make use of techniques such as brainstorming, free association, lateral thinking, and divergence to generate ideas. They favor a playful approach to creativity that allows for experimentation and exploration of connections between ideas free from premature judgment, linearity or hierarchical structure.

*Situationalists* argue that creativity is largely a social construct entrenched in particular communities of practice. Each domain possesses its own unique, constantly evolving set of expectations regarding what is considered "creative"; these expectations are largely governed by social approval from gatekeepers—people who have authority to decide which creative works will be included in the domain [1]. Reputation, recognition, and influence are recognized by situationalists as motivators and shapers of creativity. They often view their ideas as emergent from exchanges with friends, peers, and mentors.

definition of creativity is much like that of Shneiderman's, with the caveat that we blur the distinctions between evolutionary and impromptu creativity; people can fluidly transition from impromptu creativity to active forms of evolutionary creativity and back much more easily in online remixing communities. Thus, support for impromptu creativity in software interfaces is also important in considering the passive and active engagement with the creative medium by users.

*Models*

The *genex* model [9] suggests that creativity can be understood as a set of four phases that occur with relation to an individual creator. The creator (1) *collects*, learning from previous works stored in libraries, the Web, etc.; (2) *relates* by consulting with peers and mentors at all stages of the project; (3) *creates* by exploring, composing, and evaluating possible solutions; and (4) *donates* or disseminates the creation to the aforementioned libraries. These phases may occur in any order and may repeat and iteratively cycle. For example, a creator may return to the Web for ideas throughout the creative process, or the dissemination of results can support users looking for previous work.

The genex model was partially motivated by the frequent portrayal of creativity as a lonely and individual experience, an often overrated perspective [4, 6]. In response, Shneiderman proffers a number of affordances associated with a connected and online creation environment for an individual, such as access to previous work and consultation with peers and mentors. He places little emphasis, however, on the transformative power of these networks of creative individuals which arise and thrive as online communities of cultural production, instead viewing them essentially as resources for the individual creator. The promise of collaborative creation communities and the distribution of creative work among a group of individuals engaged in creative production is one which begs for more attention.

The fish-scale model of collaboration [4] emphasizes that division of labor is inadequate to describing social creativity. Social creativity involves the emergence of meaning involving synergistic interaction among creative individuals—not just the sum of individual contributions. These synergies arise at the overlapping boundaries of the scales, which each represent the unique and incomplete competence and knowledge of an individual. It is at these shared boundaries that personal creativity has an opportunity to transmogrify into evolutionary creativity through a communicative or direct creative act.

*Perspectives on Creativity*

Shneiderman [9] reviews the literature on creativity and identifies three broad perspectives. We find the *inspirationalist* and *situationalist* views, emphasizing the importance of free association and social context, respectively, particularly illustrative of creative practices in online communities centered on collaborative creation. (See sidebar for more details.)

## Position

The importance of the individual in creative acts seems undebated [2, 4]; the issue at stake is really how social creativity promotes synergies in individual creativity which go beyond a simple division of labor model. While the creative acts of *collect, relate, create, donate* are

typically imagined as taking place within an individual, we suggest that these subtasks involved in the creative process, when multiplexed across individuals in a collaborative remixing environment, allow creative contributors to fluidly move in and out of the process at different stages. We do not contend that this process no longer takes place in the mind of each individual as he or she makes creative contributions, but rather that a more useful model of *distributed creativity* is needed for understanding creativity in the context of online collaborations. When seen at a larger scale, individuals may make creative contributions to different parts of a collaborative process which create synergies when combined with the contributions of others at different stages.

In other words, we can understand the creative process model of collect, relate, create, donate as not only an internal cognitive process, but also an external cognitive process happening out in the world. People take on roles which correspond to different facets of the creative process at different times as they see fit.

*Creative Roles in Cultural Production*

Beginning in the 1930's with Sartre and others and extending into the 1970s with the post-structuralist semioticians, there arose an interest in the study of the reader as a first class meaning-creator in the author-text-reader triumvirate of literature. This came to be known as reader-response theory. In many ways this presages the current dialogue about the conflation of producer and consumer, with the caveat that digital media affords actual *editing* and *commenting* by "consumers" rather than the simple passive meaning-making associated with reading literature. However, even the passive consumption of media online can now be measured and this leads to metrics which further influence the creative environment through their ability to filter content.

With the advent of the Internet, members of online communities may engage the full spectrum of cultural production during a brief visit to a website. Web-based creative tools allow users to quickly and easily add or find digital representations of cultural products, annotate them with comments or metadata, re-appropriate them with new meanings or fundamentally alter them, and disseminate their work with the click of a button. As cultural products are made, shared, and remade in this fashion, their histories are often lost in a sea of iterations. The term "creator" becomes a relative one, situated in a networked tapestry of influences that are impractical or impossible to tease apart.

It is this socio-technical network of influences conflating the roles of creator and audience that underpins the model of distributed creativity that we propose. Specifically, we believe that *free association* of ideas as a central concept of creativity provides a useful lens for understanding the creative process in online communities of cultural production. An individual participating in such communities fluidly traverses a range of creative roles from consumer one moment to producer the next, collecting, relating, creating, and donating, acting out of curiosity and instinct at least as often as with intention and reason. Even when the individual does not directly communicate with members of the community via human language, his or her actions necessarily modify the digital collective in a subtle or profound way—actions which, in turn, evoke responses and reactions from other individuals, through a process known as stigmergy [3].

Despite this mutability of creative roles, it is still possible to name, identify, and categorize them in order to study patterns and interrelationships. Our model of distributed creativity groups related activities together for generality purposes, although a fine-grained spectrum of participation can often be articulated [5]. We find it helpful to identify three broad categories of creative roles, *synthesizers, analyzers,* and *viewers*, based on a subset of typical creative activities (*i.e.*, collect, relate, create, donate) that distinguishes each role from the others (Figure 1).

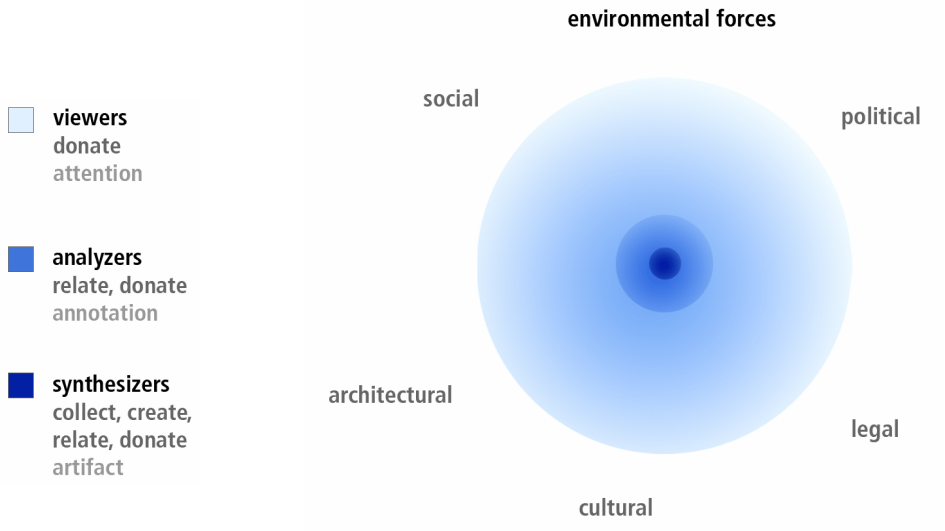


**Figure 1.** Creative roles and processes are influenced by environment forces.

*Synthesizers* can be thought of as playing the role formerly known as "creator" and, perhaps surprisingly, comprise the least frequent role in distributed creativity. A synthesizer assembles media bits collected from a variety of sources, generated by himself or herself, contributed by the creative community, or re-appropriated from external cultural artifacts. The work is complete when the synthesizer is satisfied with the assembly and chooses to publish it in the codified format advocated by the community, making it available to analyzers, viewers, and other synthesizers. Synthesizers have the exclusive purview of the process of donation of the cultural creation. Besides these unique practices, synthesizers also engage in those of the other roles.

*Analyzers* are perhaps an order of magnitude more prevalent than synthesizers, and are chiefly concerned with annotating, rating, and providing commentary on the works they view. These analyses serve as an important associative resource for both synthesizers and viewers. Analyzers provide feedback and evaluations for synthesizers to consider, as well as motivation and impetus for iteration and improvement. Viewers may leverage the contributions of analyzers individually, to enrich their understanding of the work being discussed, or in aggregate as a collaborative filtering mechanism enabled by metadata tagging. The nature of discourse prompts new associations, analyses and syntheses.

*Viewers* make up the bulk of an online community of cultural production and play the crucial role of providing social context for the creative process. In contrast to past conceptions of viewers as passive consumers of content, viewers actively participate in distributed creativity as a new brand of collective "gatekeepers." As most such communities lack the classic editorial model of gatekeeping, an oligarchical contingent of respected experts whose approval must be won through well-defined social processes, in their absence the community as a whole determines the works that

will be deemed "creative" and granted widespread exposure. Viewers forge the character of the community and express their opinions in the works they choose to access time and again. Accrual of passive viewership metrics (*e.g.*, number of views) provides a cue to analyzers and synthesizers and may in turn affect the comments and creations of analyzers and synthesizers.

The key paradigm shift and central tenet of our model is that synthesizers, analyzers, and viewers are in fluid roles. In online remixing communities, analyzers and viewers can transition into an active synthesis role as they see fit and are motivated to do so. Thus, even though the facet of donation of the cultural artifact is limited to the role of synthesizer, anyone can now take on this role and participate in the donation and dissemination of a new cultural artifact. Analyzers can impact an artifact by providing associations and stimuli that a synthesizer may then creatively incorporate.

Outside of these roles, environmental factors assert fundamental affordances and constraints on the creative process. Legal, economic, social, cultural, and architectural forces interplay with each other to affect, sometimes profoundly, how creativity is negotiated within a community or domain [8]. In the context of distributed creativity, environmental influences represent inputs and constraints to every facet of the creative process.

## Application

Jumpcut [7] is an online video remixing community that we have been qualitatively studying through participant observation, interviews, content analysis and critical analysis of its interface. Many of the aspects of distributed creativity are embodied in the interface, community, and behavior on Jumpcut.

One of the prominent themes that emerges from our study of Jumpcut is the importance of free association in the creative process. Many users describe their synthesis procedure in situational terms involving iterative cycles of search, browse, collect, relate, and create. The prominence of intertextuality of videos and users on the page of each video allows viewers to fluidly transition to collectors and then synthesizers by grabbing clips that they see in movies and that have inspired them in some way. Users described the integration of clip searching into the video editing interface as greatly facilitating their creativity by providing associations (through keywords) to other footage that they then might decide to include.

Videos often elicit other videos, either in thematic response to, or as commentary on the content or behavior prevalent in another's video. One interviewee intimated a story of how he remixed the clips of a scantily clad female user in order to express his disapproval of her content on the site. Another user created a virtual interview by splicing together her own clips with those of another community member. Many remixes function to shorten clips, add titles, change the music or audio, or to play with the aesthetic look and feel of a video through filters. These are salient examples of analyzers stepping into the role of synthesizers to affect the cultural end-product.

In some cases, comments by analyzers spurred changes by other synthesizers. One user spoke of how he made suggestions for music which would better suit the visuals in the movie of another user. A comment

suggesting fading out the music track out at the end of a video appears to have been met by the synthesizer with approval as the audio was subsequently faded.

The availability of footage was mentioned by several interviewees as a factor in their creative process. The ability (or lack thereof) to collect "interesting" video material impacts how synthesizers go about their work. One interviewee spoke of a project for which he wanted clips of the streets of Amsterdam, but was unable to find such clips until he located another user on Jumpcut located in Amsterdam who was willing to collect the clips and provide them to the synthesizer. In this case, the creative facet of collection was distributed to a collaborator. The content collected naturally affected the resulting creative artifact that the synthesizer first initiated.

Despite the fluidity of users between creative roles and their apparent willingness to adapt their own material or make adaptations of others, tensions remained among users who desired a finished product. Several interviewees mentioned that they would like to be able to download a "final" video and that it felt good when a video was completed. What remains unclear is whether analyzers who become synthesizers by remixing an initial video upset this feeling of closure for the original author.

All users interviewed recognized a reduced or completely relinquished sense of authority over their creations and clips online. Users understand and are generally receptive to others synthesizing on top of their material, but still creative ownership and authorship as they relate to the individual in modern society are areas where additional research is needed. As artifacts produced through distributed creativity are continually evolving and collectively created, will these practices clash with the highly individualized cultural constructs of authorship, recognition, and reputation?

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