

Poetry of Separation: the aesthetics of spatial montage and generative editing for multi-layered screens

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Abstract. ‘Poetry of Separation’ is a media artwork that utilizes an algorithmic generative editing system, selecting shots in real-time to be rendered over four screens arranged in layers. Editing in cinema reconstructs images by montage, deriving meaning from the juxtaposition of multiple shots. Although multi-screen projections have been used to present sectional montages that stress the simultaneity of events, spatially separated screens can disrupt attentiveness and affective involvement; the layered architecture avoids disruptive fragmentation. The generative editing system selects shots for the layered screens stochastically, with authorial constraints and probabilities using pre-determined shot criteria. Narrative flow and authorial intents are not damaged due to these criteria, but nevertheless unexpected effects arose from the stochastic system. The authorial intentions of improvisation and separation in the film content of ‘Poetry of Separations’ find resonance with the automatism of the generative editing system and multi-dimensionality of the screens.

Keywords: Generative montage, generative cinema, spatial montage, complexity editing, multi-layered screens, database cinema, new media art.



Fig. 1. Photographs of the ‘Poetry of Separation’ miniature.

1 Introduction

Cinema is an image of thought, and thought is multi-layered and multidimensional, just as poetry speaks with many voices simultaneously. Editing reconstructs images in a process akin to the selective reconstruction of memory, expressing a multi-layered nature through the complexities of montage. Montage literally means, “setting together” or “assembling”: the juxtaposition of separate shots to reveal and intensify events. By selecting and sequencing shots an editor can establish visual narrative and convey an artist’s story, but this construction realizes only a single path. Although montage offers techniques to present simultaneous events on screen, the potential to escape from linear progression remains limited [1] [2].

Montages that stress the simultaneity and complexity of events have sometimes attempted to overcome this limitation by presentation over multiple screens, particularly in the context of the 1960s “expanded cinema” movement; however, scattering screens through a space may disrupt attentiveness and affective involvement with the narrative flow [3]. The four-screen architecture enables audiences to experience diverse images with single and simultaneous vision, thus overlapped images on different screen can be used as a new system of montage film composition.

Our installation, ‘Poetry of Separations’, utilizes a multi-layered arrangement of screens to construct sectional montage within three spatial dimensions, and explore its aesthetic potential. ‘Poetry of Separations’ is also a generative artwork, embedding a generative algorithm to select and juxtapose shots across all screens. Computer generative art uses algorithms and programs to create interactions between chance, iterative procedures and dynamic processes, which can give rise to emergent complexity despite minimal involvement from humans [4].

Generative art has been extensively directed toward computer graphics and music, however efforts to apply generative techniques to the understanding or making of cinema have so far been limited, often to technological aspects of editing [5]. We consider generative editing a fascinating opportunity to re-encounter the possibilities of montage and complexity editing, and perhaps even to reflect the image of thought through automatic real-time reconstructions akin to improvisation.

The artwork’s subject is the essential separation of human beings. These authorial intentions of improvisation and separation interact with the generative editing system and multi-layer screens. The filmed material includes improvisatory acting, contemporary dance and mime. Each of these three performers acts as a fragmented individual through the separation of layered screens, yet the overlapped images of the screens emphasize a chaotic yet simultaneous sense of fragility that together can form a whole.

2 Related Work

2.1 Editing and Montage Theory

At its core, editing in cinema is the selection and sequencing of shots to reveal events and portray stories most effectively; it is a primarily connective process in order to create a whole. The choices of how to put shots together are influenced by the intents of artists and the requirements of the medium. According to the conventions of natural visual sequence and narrative flow, editing is primarily concerned with the consistency and maintenance of the viewer's mental map, followed by the necessary actions of cause and effect along the vector of running time. Nevertheless, violating these conventions of sequential continuity may intensify emotional content or reveal specific intricacies within events; approaching what has been called *complexity editing* [1] [2].

One of the most influential concepts in twentieth-century film is montage, which literally means, "setting together" or "assembling". Between 1924 and 1930, several Soviet films exhibited a radically original film style, generally known as the montage style. They conceived that filmic meaning is built out of the assemblage of shots to create new syntheses and ideologies. Eisenstein said that montage is the juxtaposition of two separate shots so that the result is qualitatively distinguishable from each component element viewed separately. He also compared montage to the multiple voices and dimension of music like a counterpoint [6] [7].

Montage is used to build narrative, to control rhythm, to create metaphors and to make rhetorical points. There are various types of montage: sequential, sectional, comparative and collisional. Sequential montage presents events in the conventional series of cause and effect along horizontal time. On the other hand, sectional montage reveals the complexity of the event, stressing simultaneous and multifaceted points of view. Comparison montage presents two similar themes by juxtaposing images from different events, while collision montage shows two conflicting themes to create a third [1] [8].

Gilles Deleuze described montage as the link from one moving image to another, which constitutes the whole (rather than dividing the whole into fragments), giving the image of time as the principal act of cinema. [9] [10].

2.2 Montage with Multi-screens

Media such as film, television, and slideshows present their images and stories sequentially on a single screen. There has been many attempts to develop montage over multiple spatially separated screens, particularly in the avant-garde and "expanded cinema" movements [11] [12]. Manovich, L [13] suggests that multi-screen spatial montage can offer alternatives to traditional sequential and temporal montage through

the juxtaposition of images of different sizes and proportions, and the possibility to present multiple images simultaneously. Marchessault, J [3] claimed that by creating a simultaneous syntax, the use of multiple screens breaks down the literary form of film. The multi-image can be considered boundless, simultaneous and multi-directional, and thus comparable to sound. Suzuki, R [14] also proposed multimedia montage as a structural synthesis of time and space, comparing it to counterpoint in music (echoing Eisenstein).

Multi-screen spatial montage offers unconventional approaches to the construction of images and creation of stories, side-stepping the linearity of the content [15]. However, it also places the whole at risk of fragmentation. A multi-layered approach to screen display be able to retain the whole while still bringing out the possibilities of spatial montage.

2.3 Generative Art and Cinema

Generative systems enfold manifestations of chance and dynamic process, both powerful themes in art. Interactions between stochastic and complex systems in generative art can result in dynamic processes with similarity to those found in nature [16]. Boden, M [4] defined Generative art (G-art) as generated by some process that is not under the artist's direct control, and Computer generative art (CG-art) as produced by a computer program with minimal interference from humans. However the many attempts to apply computer-generative systems to the understanding and making of artworks have been predominantly directed toward computer graphics and music; computer-generative cinema has been relatively less explored.

Mike, L [17] described some informal research from the 1970s, a period when he and others explored generative systems using motion picture film. They tried to work with film as a dynamic medium, so that the role of the audience was as an active participant in the production. A 16mm film, Red + Green + Blue, (R+G+B), developed the imaging of landscapes using a generative system based on analogue procedures with color reversal film.

Lobb, I [5] explained that generative cinema is a field to create cinematic experiences through the execution of computer algorithms. There are Database cinemas that make cinematic experiences through the utilization of computer algorithms such as *Texas* soft cinema project. However, due to their emphasis on database structure and simple parameter, there remains potential for more exploration with generative processes [18]. Galatema [19] is a computer generative project for making generative cinematic works. It proposed a framework to generate 2D or 3D films, using formalized network software for the basic architecture of the film. Most prior work in generative cinema has addressed the generation of images rather than editing. Although there has been some research into algorithmic editing, the emphasis appears to be technical more than aesthetic [20], [21].

3 Poetry of separation

3.1 Overview

We made a new media artwork ‘Poetry of Separation’, which utilizes a computer-generative editing system and is presented across a layered array of screens. Although ultimately the artwork is exhibited as a large size installation, we first created a prototype to simulate ‘Poetry of Separation’ in virtual environment (Fig.2), and built a physical miniature display system (Fig.1). ‘Poetry of Separation’ is a short dance film (10-15 minutes) about separation that includes acting, contemporary dance and mime. The theme of this film is the essential pain of separation and the beauty of accepting fragility as a solitary human being. The film uses acting and contemporary dancing to reveal the emotional curves of one couple after separation. A third person, the mime, embodies the universality of love and solitude.

The multi-layer display underlines an authorial intention regarding separation as an essential anxiety and pain of being human. The spatially distinct screens can give voice to isolation, solitude, and the chaotic fragmentation of individuals performing as different genres, but at the same time, the multi-layered whole reveals a simultaneous universality of pain. The film was made by a process of improvisatory performance to generate unexpected automatic movement. The use of improvisatory performance in production is conceptually aligned to the generative editing system in post-production. Like improvisation, constructing montage by generative technology can elicit indeterminate aesthetic effects. The authorial intent put into the art interacts with, and is transformed by, its internal content and the external attributes of medium [22], [23].

3.2 System design

We authored a virtual simulation model (Fig.2), and created a physical miniature for evaluation purposes (Fig.3). Four projectors are set from the bottom, projecting by rear diffusion onto four layered screens. The size of the actual screens may vary according to the exhibition environment. Because of the layered spacing, audience viewers can see each projected image differently by sideways parallax movement.

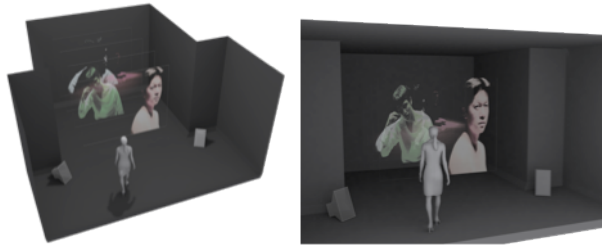


Fig.2. A spatial simulation model for installation.



Fig.3. Photographs of the display miniature infrastructure.

In order to construct montage, generative editing system was designed using a visual program toolkit VVVV. The original filmed material consists of 68 distinct shots. Each shot was classified using certain criteria based on basic authorial intents: *early stage*, *first screen*, *screen layer* and *people*. Probabilities that certain shots can be placed at specific moment and on particular screens were written on a ten-point scale ('0' is 0 percent and '10' is 100 percent). Although the construction of montage is indeterminate by the stochastic application of probability, and can create unexpected various effects, we created certain biases in order to maintain essential components of the story and significance.

The *Early stage* criterion is the probability that a shot can be placed as the first in a sequence, chosen by taking into consideration needs of narrative flow and possibilities of progressive emotional curve. This criterion is related to sequential montage. *First screen* is the probability that a specific shot will be located in the front-most screen, which will inevitably amplify its importance: not only will the front-most image appear larger and un-occluded, the volume of sound from each shot is scaled according to the screen position, such that the first (front-most) screen is much louder than the fourth (rear-most) screen.

The *Screen layer* criterion restricts what shots can be placed simultaneously over the layers. An 'S' (solo) shot cannot be combined with any other: if an 'S' shot is chosen, the other layers will be blank. An 'M' (multiple) shot can be combined with any other shot except itself (and of course any 'S' shots). A 'SM' shot can be combined with anything, including itself. The 'S' shots therefore are singled out as powerful, stand-alone moments in the work, or keypoints such as the introduction and ending shots. The 'M' shots are singled-out as those always in the context of others, rarely standing alone. 'SM' allows a greater diversity of images to be shown over the four screens, to reveal a condensed sense of complex movement within a single shot.

The *People* criterion contains woman (W), man (M), or the third person mime (T); this is the only criterion with a semantic description of the shot content. In the current installation this list is used only to restrict overlapping of images from the female performer, because her character's vocal outbursts (crying, shouting) are too intense

be overlapped. (Fig.4) (Fig.5).

Shot#	Early stage	First Screen	Screen Layer	People
1	10	9	S	W/M
2	10	7	S	T
3	9	5	M	W/M
4	9	5	M	W/M
5	8	9	S	W
6	7	6	M	W/M
7	7	4	M	M
8	6	5	SM	M
9	6	5	SM	W
10	6	5	SM	M

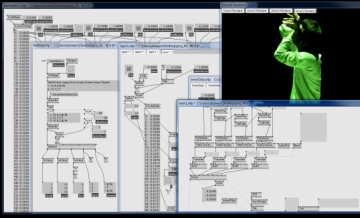


Fig. 4. A portion of the shot database and the generative editing system.

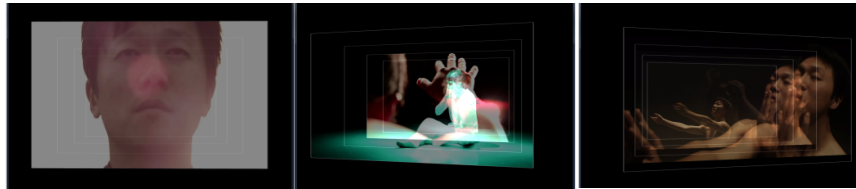


Fig. 5. Example screenshots of the virtual simulation, demonstrating the effects of screen layer properties S (left image), M (middle image), and SM (right image): The video of artwork can be viewed at <http://www.sojunb.com/work-2/>

4 Conclusion and Future works

We proposed a new aesthetic approach for generative montage in spatial dimensions by using multi-layer screens and a generative editing system. The realization of these concepts was presented through the dance film ‘Poetry of Separation’.

We found that the multi-layer screens offered abundant aesthetic effects, such as the construction of sectional montage through simultaneous events. Separated images on overlapped screens elicit a sense of continuity from fragmented images to their unification; a multidimensional perspective between elements and whole. When distinct shots are displayed on all four screens simultaneously, the overlapping images add depth. Overlapping the same shots sometimes produced more surrealistic or cubistic sensations than a single image displayed on a single screen.

The generative editing system helped complexity editing in effective and interesting ways. The overall narrative flow and authorial intents were not damaged because of the shot criteria, but nevertheless some unexpected effects arose from the stochastic system. When low-probability shots were shown, it tended to create a conflict montage, intensifying the chaotic feeling of separation.

However, there are many limitations of this work. First, the display system has been restricted so far to a miniature, not yet having an opportunity to physically install it in real space; the affective experience in an actual exhibition might be quite differ-

ent. The generative editing system was not designed to be universally useful or applicable to other artworks, though we expect many ideas to be transferable. The shot criteria are very tightly tied to the content of 'Poetry of Separation'. We plan to design a more general generative editing system as a practical and useful technology in the future. In spite of these limitations, we have taken our first steps creating generative spatial montage.

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