A Brief History and Systematic Review on Editing Techniques for Film Making

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Abstract
Film making is a dominant art form among all the art forms, which is able to combine the features and abilities from other art forms and affect the large audience. The features of the ideal film are that it must not confuse the audience and must be able to convey the message it is intended to convey. In order to create the effective films different processing steps needs to be performed. Editing is one of such processing steps used to cut and arrange the raw shots of the film. Various editing techniques are available in the literature for different purposes like continuity editing, cross-cut, dissolve, fades, etc. In order to incorporate those techniques into our project, we must know the purpose of each editing technique and the stepwise procedure to use them. The proposed study describes the evolution film editing techniques and provides a systematic review on recent film editing techniques along with their purpose and stepwise procedure to incorporate them into the project.

Keywords: Film Making, Film Editing, Continuity Editing, Cross Cut

1 Introduction

The seven forms of art are painting, architecture, sculpture, music, literature, dance, and film, with film being the most recent. On the other hand, film was regarded as the most powerful of all mediums. To integrate and transmit the tale of life and society, it is possible to combine the abilities and features of all six media [1].

In order to deliver a complete and effective film, various processing steps needs to be performed. Film editing is the part of the post-production process of film-making, representing the art and craft of cutting and assembling completed film. As technology and viewer expectations have changed, editing has evolved over time like most other parts of film-making [2]. Previously, there was no editing in the movie. A single stationary camera filmed the entire sequence. The fascination with a "moving image" was sufficient, and using the technology to tell fictional stories would have to wait a few years. Film editing back then consisted primarily of cutting from one scene to the next. The history of film editing isn't particularly fascinating, but it did have a start that paved the way for it to get to where it is now. Editing in film was just a question of joining frames to create scenes in the earlier days of cinema, in the 1890s [3].

Only a few films used "continuity editing" during this brief era, which meant that continuous shots were smoothly put together. During this time, Georges Méliès, a well-known French director, was also experimenting with editing as a visual effect. Filmmakers quickly realised that editing shots into a sequence not only added to the audience's sense of story, but also allowed them to tell more complex stories, as evidenced by Edwin S. Porter's primitive examples of editing in films like The Great Train Robbery (1903) and Rescued by Rover (1904). Following that, editing is influenced by D. W. Griffith, one of history's most significant directors. He didn't invent any of the editing techniques he used, but he gave them emotional and thematic significance [4].

Following that, more filmmakers began experimenting with the concept of film editing, with some wanting to utilise it to make strong points. With his famous Kuleshov Experiment, filmmaker Lev Kuleshov pioneered the Soviet Montage movement in the 1910s and 1920s. It involved switching between film of a man with a bowl of soup, a child in a coffin, and a seductive woman, with his expression remaining constant before cutting to one of the three. The idea was to persuade the spectator that the man felt a certain way about any of these circumstances by using the power of editing [5].

There are now a variety of editing techniques accessible that have evolved over time to provide new forms of cinematic language.

2 Literature review

Several studies in the literature have examined various film editing techniques to assess their suitability for various purposes. In addition, the investigations compared and contrasted various film editing approaches. For example, the study [6] compares two quite distinct editing versions in great detail. The first version roughly matches the order of footage trimmed in the film-by-film editor Arthur Schmidt. The second version is generated automatically using the authors' new algorithm [GRLC15] and the same set of cameras. Similarly, the [7] This paper analyses instructional techniques for students with English as a Foreign Language (EFL) studying digital editing for film-making. It starts by exploring into

the digital audio formats history known as "Podcast," as well as the term's increasing popularity and acceptance among the general public. Second, this study looks into two different types of class activities that can assist learners acquire the skills they'll need to construct their own short movie: a podcast and a music video.

The study [1] aimed to examine the film editing tools used in Thailand's best editing feature film, "Bad Genius" (2017). This is qualitative research of the theory, principle, and concept of film editing used to evaluate Thailand's "Suphannahong National Film Awards" for best film editing. Examining the sources, watching the film, and evaluating the film editing tools used in Bad Genius are all part of this research. The outcome indicates that Bad Genius' film editing approach is a concept-based edition. Film editing approaches were used to not only connect all of the story's elements, but also to elicit emotions and comprehension. The film editing methods create empathy, affinity, and emotional connection from the audience. By outlining the various applications that require autonomous film editing, reviewing current models and methods, and delivering a description of recent models and approaches, The study [8] indicates both prospective paths and important topics for future studies.

Objective of the study

1) To provide details about concept and history of film editing.
2) To provide the systematic analysis of different film editing techniques.
3) To provide details about incorporating the editing techniques into our own project.

3 History of film editing

A. The Early Ages of Cinema

In the year 1878, Eadward Muybridge was the first to uncover the foundations of motion picture and cinema. He observed that taking multiple shots of a moving or developing subject in a short period of time causes the image to appear to move. The Kinetograph was invented by Thomas Edison and a group of innovators in the late 1890s. It was designed to snap images in fast succession to create the appearance of moving subjects. Edison and his team went on to invent the Kinetoscope not long after. A device that allows people to view these moving images [9].

Edwin Porter, Thomas Edison's assistant, challenged the perception of film producers that the industry had no future. He accomplished this by using 'cutting' shots and 'jump cuts' between distinct scenes that were occurring at the same time. He claimed that you will be able to elicit emotional responses from your audience by doing so. In 1903, he made his first picture, 'Life of an American Fireman,' which showed this [10]. D.W. Griffith, an American film producer, was one of the first to apply ground-breaking editing and cutting techniques in cinema, such as the jump cut and match on action cuts. He also used new types of views in the film that had never been seen before, such as extreme close-ups of characters' faces to convey emotion [11].

The sound was also becoming increasingly popular and significant in film in the 1930s. Previously, the sound was mainly just background music that had nothing to do with what was going on visually. However, the ability of sound and the power it can have to impact audiences became relevant to filmmakers. Editors and filmmakers began to incorporate music

or actor dialogue into the story. After the 1940s, the way films were edited grew more consistent and predictable [12].

B. The Digital Age of film

The evolution of editing had essentially halted until the 1970s and 1980s. At this time, many of the various modes and conventions had mostly been established by filmmakers and had become the norm. The new developments of digital editing brought a non-linear style of editing into play among filmmakers and editors. Non-Linear editing is the process of editing sequences out of order and going back to make various changes in a film later on in the editing process. This was a significant benefit over linear editing since it enabled editors to make adjustments to a sequence without being required to re-edit the scene. Non-Linear editing was mostly done on computers and, therefore, digital [13].

In recent years, advances in digital editing tools have enabled new approaches to editing movies. For example, using editing tools such as Premiere Pro or Final Cut Pro X. Where cuts and edits can be made finely and minutely to allow for the best sequence possible. The typical modern film has over 200 hours of video; however, software like this helps editors and filmmakers to trim this down to about 2 hours easily. The software used to make modern digital films has a profound effect on the outcome of the final product, and the potential for filmmakers to edit and manipulate their films is endless [14].

Nowadays, the technology used in movies is constantly developing. With advances in personal computing technology, software, and hardware, it's getting easier to make our own amateur films with the tools we already have.

4 Film editing techniques

This section provides a systematic overview of the different film editing techniques.

A. Continuity editing

The technique of organizing and reordering shots in film and video to construct a sequence that makes perfect sense on screen is known as continuity editing. "Continuity editing" or "cut-on-action" are other terms for continuity editing. The concept of taking many shots, typically out of order and stitching them together so they emerge in chronological order, is referred to as continuity editing by filmmakers. The goal of continuity editing is to ensure that each shot builds on the previous one and preserves a consistent flow all across the film. Continuity editing is the technique of a story's editor synchronizing shots to create a smooth flow. Continuity editing is important in film and television since it enables the director to tell the story with multiple shots of the same scene [15].

Incorporating continuity editing in film
There are a number of editing techniques that ensure continuity within a scene as follows [16]:

Eyeline match: In order for the images to be spliced in post-production, when a filmmaker shows characters staring at each other in a wider angle, the direction of their glance must appear the same in close-ups.

***Diegetic sound*:** Diegetic sound is important to temporal continuity editing because seamless sound makes a scene feel as if it exists in continuous time, even as you move from one cut to the next shot.

***Matching action*:** An editor will apply this method, also known as match on action, to combine cuts from one shot with others from a different view that resembles or continues the action of the original picture.

***180-degree rule*:** This camera movement rule aids to narrative storytelling by helping viewers comprehend how two individuals stand and feel their surroundings in reference to each other.

B. Cross cutting

Cross-cutting is a technique for film editing those mixes various sequences to portray simultaneous actions inside the narrative structure. Cross cuts are frequently used to illustrate large-scale events that take place in several places, although cross-cutting "laws" are not well stated in terms of magnitude and time. The distance between those two places could be as tiny as a single house or as vast as the universe. The primary concept is to provide the audience different perspectives from different areas. Filmmakers frequently employ the technique of cross cutting between two characters on the telephone. Crosscutting can keep audience stick to their seats. Consider an actor trying to defuse a time bomb, with cutaways of the ticking clock weaving in and out of the hero's efforts [17].

Incorporating the cross-cutting in film

Some points need to be considered while incorporating the cross-cutting in film as follows [17].

***Get Your Hands on the Right Footage*:** To set yourself up for success, get a video that you will crosscut. Consider the following considerations when making your shot list.

***Colour Coding*:** As you start post-production in Premiere Pro, use label colours to designate your scenes and help you recognise them.

***Experiment with Music*:** Music and other audio effects may be used to connect your various scenarios. This might possibly be used in a movie or commercial.

***Maintaining the Flow of the Scene*:** Try imitating movement in both videos to link your character. Cut to the character in the next clip doing the same thing if the character in the first footage moves across the camera frame from left to right.

***Do Not Confuse Your Audience*:** Confusion is not considered as suspense. You want your audience to understand what they're seeing so they can ask questions.

***Seek Feedback*:** The way to identify if you're confusing your viewers is to share your work. Show your crosscut scenes to a buddy and get their critique when you're no longer sure in your own judgement.

C. Cutaway

A cutaway represents the shot in cinema and television which focuses on any other things except the main subject or actions. A sequence could start with the primary shot, then move to a cutaway shot before returning to the main shot. Cutaway shots are very helpful for filmmakers by enabling them to 'cut away' from the key actions to a secondary actions or response. Cutaways are frequently used for visual punchlines in the lengthy animated television sitcom Family Guy [18].

Incorporating cutaway editing in film
Creating a cutaway shot is one of the easier maneuvers in the domain of film editing. Here's how to do it [19].

Assemble your footage from two single shots: You'll need two different pieces of film to make a cutaway shot. Even though they're most certainly digital, we'll call them rolls. Your main film is on Roll 1, and your cutaway film is on Roll 2.
Create two video tracks in your editing software: Assign Roll 1 to the first video track and Roll 2 to the second video track.
Interrupt Roll 1 by briefly cutting to Roll 2: Cut from Roll 1 to Roll 2 after you've reached the right moment for a cutaway. Allow Roll 2 to display any information you'd like to express, then cut back to Roll 1.

D. Fade

Since the beginning of film-making, fades are being used. Transitions between fades are commonly referred to as fade-out and fade-in. They're progressive transitions in which a scene fades from black to black or vice versa. Fades and dissolves were commonly utilised in early film-making and are now considered an antiquated technique by many filmmakers. On the other hand, modern fades and dissolves have been utilised to great advantage in a variety of ways [20], [21]. Fades can indicate a shift in time, provide insight into a character's mind, or imply parallelism [22].

Incorporating the fade
The following steps represent the procedure to apply fades using Animotica software [22].

To apply the fade in/ fade out on a single clip:
1. Tap the clip on which you wish to apply the fades. This will open up some of editing choices for you.
2. Select Fade.
3. Simply change the Fade In/ Fade Out Duration slider in the new window to choose when the clip should fade in or out. You can now pick between white and black backgrounds for Fade In/Fade Out.

To apply fade in/fade out between two clips:
1. Between the two clips, select the transition icon.
2. Adjust the Length of the Transition slider by selecting Fade Black or Fade White.
3. Set the clip's duration to 3 seconds.
4. Set the opacity transition duration to 2 seconds.

You'll get a smooth fade-in or fade-out effect this way, which is ideal for changing the scenario in the movie or converting it into a seamless loop.

E. J & L cut

J and L cuts are simple but effective film editing methods for keeping viewers focused throughout scene transitions. Both are split edits, or scene transitions between shots, in which the audio and visuals change at different times. The J and L cuts are widely utilized as transitions between the content in scenes instead of traditional effects of transition like a cross

dissolve or fades because they enable the audience maintain visual consistency. "It gives people a cushion to move on to the next spot," explains videographer Nainoa Langer [23].

Incorporating J&L cut in film
The steps for incorporating J&L cut into film editing are as follows [24].

Insert a J and L cut.
1 Add B-roll and primary footage (together with its soundtrack) to your timeline.
2 Remove any gaps between the clips with the Ripple Edit tool.
3 Drag the second clip over the primary video footage where you want the audio to overlap.
4 Select the Rolling Edit tool and select the primary video while holding the Alt or Option key. Overlap the B-roll film as much as you wish.
5 Use the Audio Effects menu in the Effects panel to smooth out the audio transition for a more natural cut.

Add an L cut.
1. A similar procedure is used for L cuts. The key difference is that a L cut uses the Edit tool to roll back the video rather than the audio.
2. Add your primary video footage, B-roll, and audio to your timeline.
3. Remove any gaps between the clips with the Ripple Edit tool.
4. Stretch your primary video material over the audio track linked with the B-roll using the Rolling Edit tool.
5. Use an effect from the Audio Transitions menu to smooth out the transition between the video clip and the voice track.

F. Jump Cut

Jump cuts are a basic editing technique that may give your films and social media videos a spectacular finale. They date all the way back to the 1890s. It deletes a period of time by removing film between two places. Most filmmakers use them to portray characters moving in front of a static background. It's a form of stylistic editing that emphasizes the cut. It can produce some unexpected or startling effects as a result of this [25].

Incorporating jump cut in a film
Follow these procedures to make cuts with the Razor tool [25]:

1 Add the video clips to your timeline.
2 Make sure the Snap setting is enabled and your audio is locked so that your clips may snap into place next to each other and your audio remains in sync after a cut.
3 Select the Razor tool (or press C) and click the beginning of your cut in your clip.
4 Re-click the tool and make a cut where you want the action to resume.
5 Use Alt/Option (depending on your operating system) + Eliminate to ripple close the space between clips as you make cuts, making it easier to choose and delete pieces.
6 Zoom in on the timeline (touch the + key) and repeat your Razor work to fine-tune your cuts even more.

G. Match Cut

Any cut that stresses spatio-temporal continuity is referred to as a match cut, and it is the foundation for continuity editing. When we talk about continuity editing, we're talking about procedures that assist generate a logical flow between dissimilar shots, resulting in a smoother narrative transition that doesn't jar or confuse the spectator [26]. A match cut is an editing technique used by directors to establish a relationship between two things and to generate a visual metaphor. It's a spatially appropriate cut inside a scene. This can be between two different things, two different environments, or two different compositions in which an object graphically matches in both photos [27].

Incorporating the match cut
Whether you want to improve and streamline your personal projects, corporate movies, wedding films, or whatever, here are some pointers to remember when shooting and editing match cuts [28]:

Plan and storyboard: While a match cut may occasionally be discovered during post-production, the finest ones are those that have been storyboarded, shot-listed, and prepared from the start.
Pick your spots: The most important and useful technique is to be cautious of how and when you use match cuts.
Mix in different transitions: Similarly, there are a variety of additional transition kinds to incorporate from time to time. While direct cutting is effective for connecting sequences and scenes, you can also experiment with crossfades, dissolves, and other creative transitions and motions.
Get creative: The final and most critical piece of advice is to be inventive with your match cutting.

H. Montage

Montage is a technique of cinematic editing that mixes a series of brief pictures or clips into a single sequence that is usually accompanied by music. Montage is a French term which means "assembling" or "editing." Montage sequences are a vehicle for conveying a large amount of information to the audience at once, and they usually indicate the passage of time or multiple concurrent events. For example, in a romantic comedy, a montage can show the rising love or connection between two lovers as they get to understand each other [29].

Incorporating montage in film editing
After you've collected all of your clips, you can edit them anyway you wish. "First, get into the habit of generating movies in a systematic manner, and then focus on the originality," Park recommends. Stick to the necessities and come back to the creative components later. It's easy to get hooked up on artistic choices and details when you first start editing. Here's an example of a workflow you may use [29].

Make folders for your media files: When you have a lot of video clips, you can organise it by file type, such as sound effects, voice-overs, and background music in a folder for audio files.
Figure out your who and why: Before you start, make sure you know your target audience and why they should care about the video.

***Storyboard your video*:** Storyboarding is the process of planning out the shape of a video. A storyboard can be anything from frame-by-frame doodles to notes on the story's progression.

I. Shot/Reverse Shot

The shot/reverse shot is a movie making technique where two individuals shot from different camera angles can appear in the same scene. One camera setup in a shot/reverse shot (also known as a shot/counter shot) is a medium shot or close-up shot of a character engaging with someone offscreen. The action then switches to a reverse aspect, showing the offscreen character engaging with the first character, except this time the first character is the one who is offscreen [30].

Incorporating shot/reverse shot
The steps for incorporating the shot/reverse shot are as follows [31].

Establish your first shot: This will be a single shot of a character conversing with someone on the other side of the screen.
Create a reverse angle for your second shot: Create a second shot that focuses on the character who was off-screen in the first. When setting up this shot, keep a 180-degree rule in mind.
Conduct an eyeline match: Both characters' eyelines must appear in the same section of the frame while filming a shot/reverse shot sequence at sight level.
Embellish your shots: Different variations of the shot/reverse shot sequence exist. If you want to maintain consistency, make sure to match shot sizes. If your first shot is a close-up, the second shot should also be a close-up. If you combine two photos with differing frame lengths, the feeling of continuity may be disrupted.

5 Conclusion

The film being the most significant art type able to combine the abilities of all the other art forms. Editing being an important process in the field of film-making affects the quality or/and the effectivity of the final product if not chosen wisely. The techniques for film editing have evolved with the time, starting from the movie without any editing until the recent more advanced techniques for high quality film editing. The ultimate purpose of the film editing techniques employed in this film is to elicit empathy, affinity, and emotional engagement from the spectator The film editor is the person responsible for film editing task, it uses the raw footage, performs selection and combining of shots in certain sequence such that the finished motion picture is the result. However, the selection of the proper technique according to the need of the task is important and must be done wisely.

The presented study discussed the evolution of editing techniques and provided the brief history of the editing technique for film making. The study also presents a systematic overview of different film editing techniques, and the process of incorporating them into your own project. In this way the proposed study will be beneficial for the freshers in the field of film editing to get the overview of different techniques for film editing.

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