Analysis of Camera Work in Horror Movies

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Abstract
Camera work parameters such as shot size, camera movement, and camera angle are crucial parts for creating digital contents such as movies and games. After creating a story that is to be conveyed to the audience, it is important to be able to present the intended feeling in the contents. By using the same content but by modifying the parameters, such as from a long distance shot to a close up, we can get a great difference in the impact of the viewer’s feelings. The purpose of this study is to analyze camera work parameters in horror movies and find features that can be used as reference in future research for automatically reproducing suitable camera work in digital contents.

Categories and Subject Descriptors (according to ACM CCS): 1.3.3 [Computer Graphics]: Camera Work—Animation

1. Introduction
In this research, we focus on camera work and shot design within horror movies. Horror movies are interesting in the way that they evolve as the movie proceed. Usually, a horror movie consists of a number of scenes and cuts. These scenes and cuts are in turn used to lead the audience through a path of emotion. To get the most out of this experience, each scene and cut has to be planned well and produced not only to convey the right emotion, but also to convey the emotion at the right time and with the right force. If a horror movie only consisted of horror scenes then each scene would not have the same affect on the audience as if there were only a couple of horror scenes placed at the right moment. One example is a scene where a character is going to jump over a hole in the ground. If the character conveys the same feeling before, during, and after the jump, the audience are given very little to work with. Since the audience reacts to change, a variety of character emotions are needed to emphasize the desired emotion to the audience [FJ95].

Another example is that, if the same type of scare would be used throughout a whole movie it would numb the audience. They would simply get used to it so that it would not affect them as much in the end as it did in the beginning. Since you want to build up to the end of the movie, such a method would not work.

Some research has already been performed concerning classification of camera work. The goal of this study is to analyze how camera work is evolving throughout horror movies. A concept of five different stages called “The stages of fear” has already been defined and descriptions of these can be found in section 2 [DWM12]. By using “fear stages”, we want to compare the scenes within each and every type of stage to be able to find out if there are any notable differences between them, and also if the results differ depending on where on the timeline the stage was found.

For this study, we focused on horror scenes, and we also collected information from the other types of scenes for future use. The system described in this paper will therefore also be of use when analyzing cuts from other types of scenes.

This research is meant to be a starting point for further research, which is one of the reasons for the fact that only one movie has been analyzed. However, the movie used in this research is a horror movie that have received a high score on the site imdb.com. IMDB is a site with a large amount of users, and it is also possible to see how many votes each movie has received. The amount of votes can then be used to evaluate how reliable the score of the movie is.

In this research we investigate if it is possible to find trends in camera work that later can be used to create a database. The database will store the information of when
which type of camera work would be suitable and then place and move the camera accordingly.

2. Related work

The five stages of fear is defined by using a set of visual and audio cues [DWM12]. By defining what stages are used and to what extent in a movie, they were able to analyze and compare several horror movies. However they did not go in to the usage of camera work within a specific stage more then in some cases, which were very brief.

A short description of the five stages of fear can be found bellow.

(1) Terror - The terror stage is characterized by it’s ability to evoke anxiety and anticipation in the viewer. More than simply show the viewer a concrete threat or danger, the fear is directed towards a situation and possible danger further on. The rhythm is slow but tends to rise as the stage proceed.

(2) Horror - The horror stage is characterized by suddenness and fast pace. The fear is directed towards a present danger such as another character or object. It is fast paced and used to startle and/or chock the viewer.

(3) Repulsion - Characterized by evoking the feeling of disgust and detachment in the viewer. The emotion can be directed to either an object or a situation. It could contain moments showing, physical pain, gore, unacceptable social behavior or aversive stressful situations, such as being trapped in the dark.

(4) Recovery - Evokes a feeling of safety after dealing with a threat. It can also be the realization of something that gives hope to solve a problem or that the threat is not a treat anymore.

(5) Background - This stage is associated with the feeling of safety, and there will never be any sense of danger. However, other emotions that are not related to fear, disgust or anxiety can also be found, such as happiness or sadness.

Xu et al. have created a system for analyzing the camera work in Robot anime [XKM+15]. The method used proved to be useful for this research in the sense of what type of information that would be good to analyze. The information could not be used as it was, because of the great difference in genre, but it served good as guidelines. In the same research a scrapbook system can also be found for analyzing various information camera information. Other research using similar scrapbook system has also been done and served as reference for creating a scrapbook in our research as well [KK08] [MKT+14]. The scrapbook system will be further described in section 3.

Burelli et al. conducts research about generating camera work depending on the player type [BY13]. The result were automatically created camera work in games that makes it easier for the player to play and even enhances the performance. However it is not clear that this is what takes to enhance the gaming experience per se. In this research we want to establish how to present the content in a way to better affect the user.

3. Investigation of Camera Work in Movies

The chosen movie was divided into scenes by using Movie Maker, a movie editing program. Movie Maker could also be used to see the the length of each clip and it has the functionality to easily create screenshots. By dividing the movie into cuts the movie becomes easier to navigate for collecting the shot and camera data.

A model for collecting and record the data from the chosen scenes had to be established. Two types of data was collected; camera and shot information as can be found in Table 1 and Table 2. The shot information consists of; shot size, camera angle and camera motion. Shot size was defined as in [M01]. Reference for shot size can be found in Figure 4. The label “varies” was given to those shots where the main target shot size was spanning over more than one shot size as a result of either camera movement or character movement. As a supplement to these, the detail shot was also examined. Not everyone defines a detail shot the same. In this research it is defined as; a shot where the camera is not focus-
The camera movement and camera angles and was defined according to Sijll with addition of the top angle [Sij05]. Reference for the camera angles can be found in Figure 3. If the angle varied in a way that it crossed the border between low and medium or medium and high it was given the label “varies”. We did not make any distinction between the camera changing from low to high or high to low etc. since this was not something that was commonly found. By separating it into more labels, the data would have become insufficient to be able to analyze at this moment.

The shot information is stored as a xml file, and it consists out of information that reflects the actual content of the shot. The shot information can be seen in Table 1 and Table 2. It was also necessary to classify if the scene type was a dialogue scene or some other kind of scene since it was found that the camera work seemed to differ a lot between these two when the data was analyzed. During conversation cuts it a higher tendency to use fixed camera, within the same stage could be noticed and should be further analyzed in the future. This is something that could be explained by a higher tendency for none moving targets. As a consequence of this, only the scene type “other” was analyzed further in this research.

We created a scrapbook type of program to be able to find even more trends and where the remaining information also will come to use. The current state of the scrapbook’s ability to process the information is still limited, and it was therefor not used for achieving the current results. It is possible to enter the data found in Table 1 and 2 to get a list of cuts containing the entered input. If you now enter Fear stage as “Terror” in the scrapbook, you will get a list of all cuts with it’s respective camera and shot information. But the input information is still limited which is why we analyzed the information directly from the xml file. The only difference is that it took longer time to find the relevant data. As for now, the shot information used is limited to stage, scene type and detail.

The scrapbook system is also intended to be able to use by a producer as an aid when thinking about how to produce their own camera work.

As for the emotions, we chose anger, disgust, fear, happiness, sadness, and surprise which has been said to be universal facial expressions [EFE13]. Then we also included the emotions interest and neutral for them being well suited for our intended research.

After the camera and shot information had been collected,
Table 2: Collected shot information

<table>
<thead>
<tr>
<th>title</th>
<th>Name of the movie</th>
</tr>
</thead>
<tbody>
<tr>
<td>scene number</td>
<td>1, 2, 3 etc.</td>
</tr>
<tr>
<td>scene description</td>
<td>short describing text</td>
</tr>
<tr>
<td>stage</td>
<td>Horror, Terror, Repulsion, Recovery or Background</td>
</tr>
<tr>
<td>scene type</td>
<td>dialogue, other</td>
</tr>
<tr>
<td>number of people in scene</td>
<td>1, 2, 3 etc.</td>
</tr>
<tr>
<td>cut number</td>
<td>1, 2, 3 etc.</td>
</tr>
<tr>
<td>cut duration</td>
<td>ex. 00:00:00 for 1 second</td>
</tr>
<tr>
<td>scene area</td>
<td>indoor, outdoor, changing</td>
</tr>
<tr>
<td>main target</td>
<td>protagonist, antagonist, supporting character</td>
</tr>
<tr>
<td>sub target</td>
<td>protagonist, antagonist, supporting character</td>
</tr>
<tr>
<td>main target emotion</td>
<td>anger, disgust, fear, happiness, sadness, surprise, interest, neutral</td>
</tr>
<tr>
<td>sub target emotion</td>
<td>anger, disgust, fear, happiness, sadness, surprise, interest, neutral</td>
</tr>
<tr>
<td>main target action</td>
<td>enter stage, leave stage, attack, struggle, defend, run, hide, examine, pick up obj, place obj, communicate, interact, move</td>
</tr>
<tr>
<td>sub target action</td>
<td>enter stage, leave stage, attack, struggle, defend, run, hide, examine, pick up obj, place obj, communicate, interact, move</td>
</tr>
<tr>
<td>other</td>
<td>detail, over the shoulder, environment</td>
</tr>
</tbody>
</table>

A total of 556 cuts from the movie “A tale of two sisters” were analyzed. We were focusing on the Terror, Horror and Repulsion stages, but Recovery and Background stages were also analyzed.

Two types of graphs were created. The first type is the timeline graph as can be seen in Figure 5, where it is possible to see how the camera information collected from the shots varies over time and how the angles, camera movements, etc. relates to each other. In the second type of graph the camera work information can be seen in percentage and it was used to compare the usage of camera work between the stages.

The timeline graphs were used to faster find patterns which could be occurring due to some trends in camera work. However, this graph was not intended for analyzing the content on it’s own. The numbers all represents various information as can be seen bellow.

1. Camera movement; 12 - fixed camera, 13 - smooth movement such as tilt and rotation, and 14 - hand camera.
2. Shot size; 1 - ELS, 2 - LS, 3 - MLS, 4 - Knee, 5 - MS, 6 - MCU, 7 - CU, 8 - BCU, 9 - VCU, 10 - ECU, 11 - varies
3. Angle; 1 - Low, 2 - Medium, 3 - High, 4 - Top, 5 - POV, 6 - varies
4. Detail; 1 - detail shot
After finding some possible patterns using the graph it was further investigated by using the xml file where the shot information can be found.

4. Analysis of Camera Work

4.1. Trends for camera work in Horror Movies

To be able to find trends for the camera work, the collected data, as can be seen in Table 1 and 2, was presented in the form of graphs. Four graphs were created for every stage of fear: Shot Size, Angle, Camera Movement and Detail and the data is represented in percentage. The graphs are can be seen in Figure 6-10.

4.2. Analysis of camera work divided by fear stage

4.2.1. Terror - shot analysis

119 cuts from 30 scenes were analyzed for this stage. When it comes to the terror stage, no type of camera work is overused as can be seen in Figure 6. The shot size ranges from LS to ECU with a rather even distribution except for CU which have been found to be used a lot in the other stages of fear, Figure 6-10. The same can also be said for the camera angles and camera movement.

Concerning the camera movement in the terror stage, it greatly differs from the movement found in the horror stage, Figure 7. Whereas the horror stage has a large tendency for hand camera movement, the terror stage uses smooth movement, created by steadicam, rotation and tilt using a stand etc., or fixed camera to a greater extent.

The hand camera movements in the terror stages tends to be used together with POV or views close to POV and their adjacent shots. A common trait during these shots is that the main targets emotion is often fear, which was found using the scrapbook.

For the other camera movements it can be said that they are used to enhance the slow pace of the terror stage accordingly. Therefore the use of hand camera is something that can be seen as strange due to a cue being slow pace. However, another trait of the terror stage is an accelerating rhythm leading up to a horror stage, which can also be found when analyzing these cuts.

4.2.2. Horror - shot analysis

119 shots from 5 scenes were analyzed for this stage. As can be seen in Figure 7, what stands out is the usage of hand camera movement. Dominguez et al. writes that the horror stage is characterized by fast pace and high energy [DWM12]. Something that goes well with the use of hand camera movements. Not all shots however utilize this camera movement. Fixed camera and smooth movement created by steadicam, rotation and tilt using a stand etc. can also be found. When examining the timeline graph for the horror stage the later types of camera movements are usually used together with detail shots. These detail shots in contrast to those, found together with hand camera motion, shows information that are important to the current event of actions.
For example, in a fight scene between the protagonist and antagonist, a detail shot of a scissor can be found. This scissor is important and establishes information that the two characters take advantage of in the following cuts to come. Therefore, it is important to give the information to the audience in a clear and effective way. If it was presented by using a hand camera, it would take longer time to perceive the information, and since it is an action scene, it would not be desirable to spend too much time on showing such details. In short, it would slow the pace of the scene even if hand camera motion is usually used with the opposite intention.

4.2.3. Repulsion - shot analysis

The repulsion stage showed to be difficult to analyze due to the lack of relevant cuts. Since the dialogue cuts were not included, a total of 42 cuts from 2 scenes were analyzed for this stage. However, some tendencies can still be found when examining Figure 8.

As can be understood by the name repulsion, it is used to make the audience repel from what is seen on the screen. However, like concluded by Domenguez et al. the lowest grossing movies among those analyzed were the ones with the largest percentage of repulsion stages [DWM12]. Therefore, it should not be good to repel the audience to much which could explain the more common use of ELS and LS when comparing with other stages. While you can perfectly fine apprehend what is going on, it still gives a sense of distance to the actual event. The same can be said about the usage of top view, since it takes away the feeling of being at the scene.

4.2.4. Recovery - shot analysis

33 shots from 9 scenes were analyzed for this stage. This is actually less cuts than analyzed in the repulsion stage section. However, a larger number of scenes makes it easier to analyze and find trends.

As can be seen in Figure 9, this is the stage of fear where the shot size varies the most in one shot. But then it is also the stage where the range of shot sizes is the smallest. There is a tendency for using MCU and CU the most and then LS and VCU for contrast. The sudden realization of safety also goes well with changing shot size such is given by using push in etc.

The camera work tends to smooth movement and fixed camera. The hand camera motion that can be seen in the graph is a reused shot from a different stage.

4.2.5. Background - shot analysis

73 shots from 21 scenes were analyzed for this stage. This is the stage that tends to utilize a fixed camera the most as can be seen when examining Figure 10. Handheld camera tends to not be used at all.

Just like the horror stage, the background stage is characterized by the common usage of detail shots. A large difference however is the length of the cuts. Whereas the detail shots of the horror stage tend not to exceed 1 second, the detail shots found in the background stage can range from around 1 second and up to over 20 seconds. This is not a problem because of the lack of danger and general slow pace that characterizes the background stage.

5. Conclusion

As a conclusion for this research, by analyzing cuts after dividing them by the stages of fear, trends in camera work can be found. The same system could therefore be used to further analyze a greater number of cuts from a larger set of horror movies to be able to find even more trends.

Continued work with the scrapbook system would also help to further analyze the shot and camera information. This would include the feature of being able to see screenshots from the cuts in the scrapbook. By doing this it would not be necessary to go back and forth between Movie Maker and the graphs and it would save a lot of time when analyzing...
a greater number of cuts. Implementing the feature of being able to generate graphs directly from the scrapbook would also be helpful for speeding up the process.

We also wanted to find notable differences depending on where the particular stage was found on the movie’s timeline. To be able to find these kinds of trends a greater number of movies have to be analyzed.

References


[DWM12] Dominguez E., Watanabe T., Mikami K.: A content-based classification of horror movie scenes using fear stages, 2012. 1, 2, 5, 6


