

# Formalist Criticism: A Study on Face Recognitions to Contribute an Alternative Aesthetics in Film Settings

Ratanachote Thienmongkol<sup>1</sup> and Abdunroni Samaeng<sup>2</sup>

<sup>1</sup> Department of New Media, Faculty of Informatics, Mahasarakham University, Mahasarakham, Thailand

<sup>2</sup> Creative Media LAB, Faculty of Informatics, Mahasarakham University, Mahasarakham, Thailand

Email: ratanachote.t@msu.ac.th, ronniekop@gmail.com

**Abstract**—In the past, a critical scene in film studies requires an expertise of analysts to verify the axiological paradigm. This paradigm refers to study the formalist criticism in film settings. Hence, the comprehensive of natural film concepts needs to be required; if we want the empowerment to criticize a scene design in film studies. On the other hand, this research tried to experiment the new alternative way to criticize a scene design in (horror) film studies by using scientific methods along with phenomenal studies to identify the formalist criticism in film settings. We applied a face detection technique to study the relationship between eye-tracking and face expressions to analyze and suggested the new alternative design of formalism in a film setting. The key variables that were analyzed consist of eight elements; 1) neutral, 2) happiness, 3) surprise, 4) anger, 5) disgust, 6) fear, 7) sadness and 8) eye-tracking position. The key results of this experiment found average scores of movie clip 1 have more surprise feeling than other movies at 1.45 points. Meanwhile, the highness scores with fear feeling is the movie clip 3 at 0.27 points.

**Index Terms**—film study, scene design, communication design, face detection, eye-tracking, visual literacy

## I. INTRODUCTION

A formalist criticism bases on the principles in film studies can be divided into three types; 1) film review, 2) film criticism and 3) film academic writing [1]. Particularly in the type of film criticism, an analyst needs to be proficient with a film natural concept that synchronizes the systematic ideas of genetic investigation, contextual/immanent analysis and judgmental evaluation. Meanwhile, the film criticism only judges on “satisfaction or dissatisfaction” and “like or dislike” from an audience perspective [2].

This point reflects the different paradigms of film judgment between the general audiences and film experts. This is because the audiences pay attention on film judgment base contextual analysis such contents, actors, performances, characters, special effects and basic formalist in film settings [3]. However, these judging factors convince the film industries emphasize to produce

a movie which runs by the big name of actors, attractive visual effects, film composition, lighting, camera move or easy content for watching movies. These easy notes of formalism in film also effect to the trendy of movies [4].

As above, it can be seen that the study of developing film settings are one of the important chapters in film study. This chapter is able to the important part to create attractive attention with audiences. Therefore, this research focused on the study of relationship between face expressions and eye-tracking. Our experiment inspected the representing emotion on the facial areas of respondents that related with the focusing areas of eye-tracking; during they are watching the sample movies. The technique of face detections were applied to recognize the relationship between the emotions and eye focusing on the areas of movie screen. The findings of these studies were synthesized and presented as the new alternative formalisms in film setting. However, the case study of this research experimented with the theme of horror movie.

The aims of this research focused on; 1) study of the relationship between eye-tracking and face expressions to analyze the formalism in a horror film and 2) synthesis and presenting of a new alternative of design elements in the horror film setting.

## II. SCOPE OF THE RESEARCH

The scope of research was divided to four parts follow by; Scope of the experiment: we employed one of the best three horror movies in Thailand between years 2000 and 2010. The movies consists of; 1) the eye in year 2002, 2) the shutter in year 2004 and 3) the phobia two in year 2009. These movies were selected from the box office of Thai horror film. The selecting scenes of each movie were captured from the key highlight around 5-6 minutes in order to record the continuing of human emotions on their faces [5].

*Participants:* this research focus on the target of teenager who is one of the big groups of Thailand in a film market. The samplings were opened for volunteer who interested to join this testing. The numbers of participants were 45 people which consisted of 24 males and 21 female. Before testing, all participants were examined their visual acuity (VA). Their VA scores were

20/20 (males) and 20/25 (females) which mean they are average VA.

*Laboratory instruments:* the laboratory setting, we employed the built-in HD camera in stand-alone computer. The application programming interface (API) we used the “Sightcorp” software to detect and recognize the facial of respondents. The quality of API could be able to map facial areas at 143 points in the image directly to facial muscles [6], [7].

*Key variables:* The key variables in this study includes the eye tracking and seven factors of facial emotions from respondents which follows by; 1) neutral, 2) happiness, 3) surprise, 4) anger, 5) disgust, 6) fear and 7) sadness. All of these variables were collected and recoded as the real time during the respondents watched the movies.

### III. RESEARCH DESIGN

The research design in is study was contributed from quasi experimental research. This design applied for manipulating with the groups of participants and studied the relationship between eye-tracking and face expressions. The research methods in this experiment consist of five core steps by following (see Fig. 1);

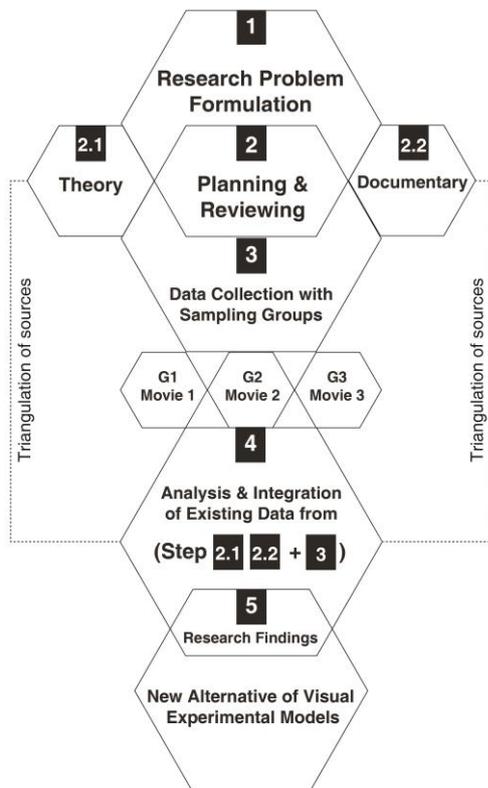


Figure 1. The research methods of this experimental research

*Step 1:* The researchers started for formulating research problem in a film study by focus on the relationship between eye-tracking and face expressions to analyze formalism in a horror film. This study emphasizes to create new alternative formalisms in the horror film setting.

*Step 2:* This stage applied a qualitative approach to review theoretical studies and documentary about film

concepts were collected. It also included review on the field of face detection techniques, the (Sightcorp) software ability, facial muscles, psychophysics, face recognition and perception of facial emotions [8], [9].

*Step 3:* The laboratory were employed in this stage. Our team installed the laboratory and invited the participant by sampling as a volunteer who interested to join this experiment. The data collection team divided sample groups as a three cluster and gave them watched a different story of sample with three horror movies. Before watching the movies, the participants were tested their VA to confirm their eyes accuracy of condition (see Fig. 2). However, we also examined the correcting point of eye tracking that synchronize between eye mobile and eye-cursor on desktop screen. This exam assisted us to reduce the tracking error and proved the accuracy of eye caption. This is because sometime if the firelight was less of brightness; the efficiency of eye caption will be reduced.



Figure 2. The LAB testing and data collecting processes

*Step 4:* In the part of data analysis, we set up the eight elements to capture the face recognitions which consists of; 1) neutral, 2) happiness, 3) surprise, 4) anger, 5) disgust, 6) fear, 7) sadness and 8) eye-tracking position. The point of analysis, we defined the maximum score as a ten point of rational scale in each element. The analysis of face recognitions were synchronized with the direction of eye tracking which the emotional scores were recorded in every second by using the principle of image processing techniques (MATLAB): the results came out as a raw data (see Fig. 3). We also designed the nine sections on the movie screen in order to define the areas of eye tracking analysis (see Fig. 3). After we received the raw data, we analyzed them by applied the frequency distribution to classify all of the emotional scores from seven feelings of respondents; while they were watching the films. However, the particular variables that we focused following by eye tracking, surprise and fear

emotions. The last stage of data analysis, we applied the technique of data triangulation to synthesis the emotional scores with the formalist criticism in film studies based on the heuristic concept [10]. The key findings will be described and discussed in the next section.

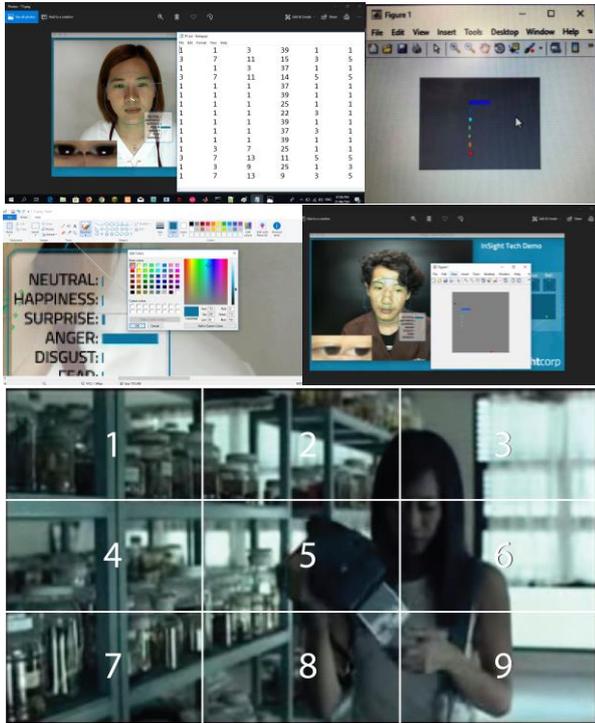


Figure 3. The transformative from real-time face detection to raw data and the nine sections of eye tracking analysis

Step 5: After, we synthesized the raw data of respondents together with the principle in film studies: we tried to contribute the alternative aesthetics in film setting based on the heuristic concept. The issues of discussion will be presented in the last sections.

#### IV. RESEARCH KEY FINDINGS

This section describes the key findings after conducted the laboratory test. The key findings will present as a three section follows by; Participants: the number of participants who were volunteers had 45 people which consisted by 24 males and 21 females. They are also having the average age at 25.2 years. Meanwhile, the testing results with visual acuity (VA) of respondents showed the average points at 20/30, which means their eye situations stay at the average condition (see Table I).

TABLE I. DEMOGRAPHIC AND VISUAL ACUITY DATA OF RESPONDENTS

Gender	Respondents (N)	Age (Mean)	Visual Acuity (VA) (Mean pt.)
Male	24	24.7	20/22
Female	21	25.7	20/24
<b>Sum</b>	<b>45</b>	<b>25.2</b>	<b>20/23</b>

Key findings of movie 1: The length of times in the horror movie-clip 1 has 299 seconds. After analysis, we

found the average scores in each section of respondent emotions' follows by; neutral (4.04 pt.), happiness (0.72 pt.), surprise (1.44 pt.), anger (2.25 pt.), disgust (0.05 pt.), fear (0.27 pt.) and sadness (1.17 pt.) from maximum score at 10 points (see Table II).

TABLE II. THE AVERAGE OF EMOTIONS IN MOVIE 1

Time (299 sec.)	N	H	S	A	D	F	S
<b>Average of emotions</b>	4.04	0.72	1.44	2.25	0.05	0.27	1.17

(N)neutral, (H)appiness, (S)urprise, (A)nger, (D)isgust, (F)ear, (S)adness

However, in part of fear and surprise emotions which are the key feelings that we focus to study and synthesis in the movie clip 1. We found the frequency of fear emotion in a black line has more congestion during the second 62-68 (7sec.), 129-137 (9sec.), 220-225 (6sec), 235-242 (8sec.) and 251-271 (21sec.). Meanwhile, the frequency of surprise feeling with the gray lines found that the congestion of surprising during the second; 51-63 (13sec.), 102-107 (6sec.), 116-133 (18sec.) and 214-299 (85sec.) (see Fig. 4).

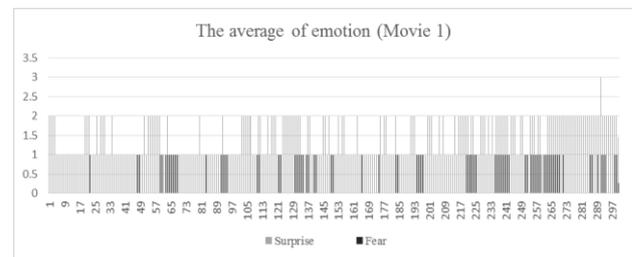


Figure 4. The average emotions of surprise and fear feelings (movie 1)

Key findings of movie 2: The length of times in the horror movie-clip 2 has 297 seconds. After analysis, we found the average scores in each section of respondent emotions' follows by; neutral (4.04 pt.), happiness (0.72 pt.), surprise (1.44 pt.), anger (2.25 pt.), disgust (0.05 pt.), fear (0.27 pt.) and sadness (1.17 pt.) from maximum score at 10 points (see Table III).

TABLE III. THE AVERAGE OF EMOTIONS IN MOVIE 2

Time (297 sec.)	N	H	S	A	D	F	S
<b>Average of emotions</b>	4.29	0.42	1.40	2.12	0.43	0.06	1.10

(N)neutral, (H)appiness, (S)urprise, (A)nger, (D)isgust, (F)ear, (S)adness

In part of fear and surprise emotions we found the frequency of fear emotion in a black line has more congestion during the second 48-50 (3sec.), 75-78 (4sec.) and 113-116 (4sec). Meanwhile, the frequency of surprise feeling with the gray lines found that the congestion of surprising during the second 156-162 (7sec.), 181-214 (33sec.), 224-239 (15sec.) and 242-297 (55sec.) (see Fig. 5).

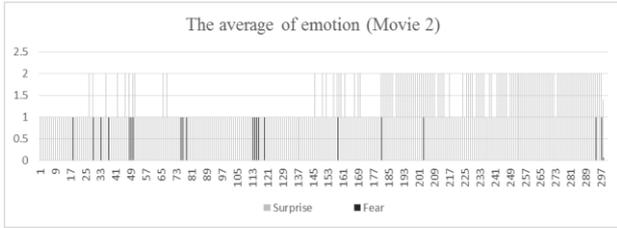


Figure 5. The average emotions of surprise and fear feelings (movie 2)

**Key findings of movie 3:** The length of times in the horror movie-clip 3 has 247 seconds. After analysis, we found the average scores in each section of respondent emotions' follows by; neutral (5.10 pt.), happiness (0.13 pt.), surprise (1.14 pt.), anger (1.58 pt.), disgust (0.08 pt.), fear (0.27 pt.) and sadness (1.34 pt.) from maximum score at 10 points (see Table IV).

TABLE IV. THE AVERAGE OF EMOTIONS IN MOVIE 2

Time (247 sec.)	N	H	S	A	D	F	S
Average of emotions	5.10	0.13	1.14	1.58	0.08	0.27	1.34

(N)neutral, (H)appiness, (S)urprise, (A)nger, (D)isgust, (F)ear, (S)adness

In part of fear and surprise emotions we found the frequency of surprising emotion in a gray line has more congestion during the second 2-6 (5sec.), 64-70 (7sec.), 95-107 (13sec.) and 237-243 (7sec). Meanwhile, the frequency of fear feeling with the black lines found that the fearing congestion during the second; 37-42 (6sec.), 107-112 (6sec.), 116—122 (7sec.) and 202-242 (41sec.) (see Fig. 6).

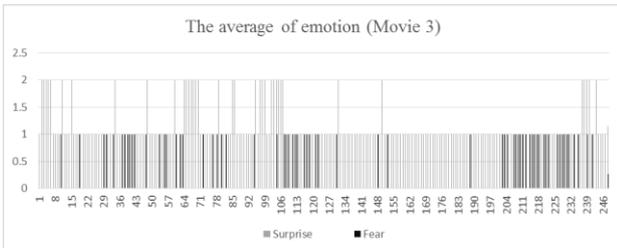


Figure 6. The average emotions of surprise and fear feelings (movie 3)

Finally, the discussion issue of key findings will be synthesized in the next topic.

## V. DISCUSSIONS AND SUGGESTIONS

This section discusses the significant issues from key findings after analyzed data from our laboratories. The main sections will divide as three issues follows by; 1) comparative scores of sample movies, 2) discussion and analysis composition arts in film setting and 3) suggestion an alternative aesthetic element in film settings.

### A. Discussion Issue 1

After we compared the data about surprise and fear emotions from each sample horror movie. We found the average scores of movie clip 1 have more surprise feeling than other movies at 1.45 points, during the time between

214-299 second from 299 second. Meanwhile, the highness scores with fear feeling is the movie clip 3 at 0.27 points, during the time between 202-242 seconds from 247 seconds (see Fig. 7).

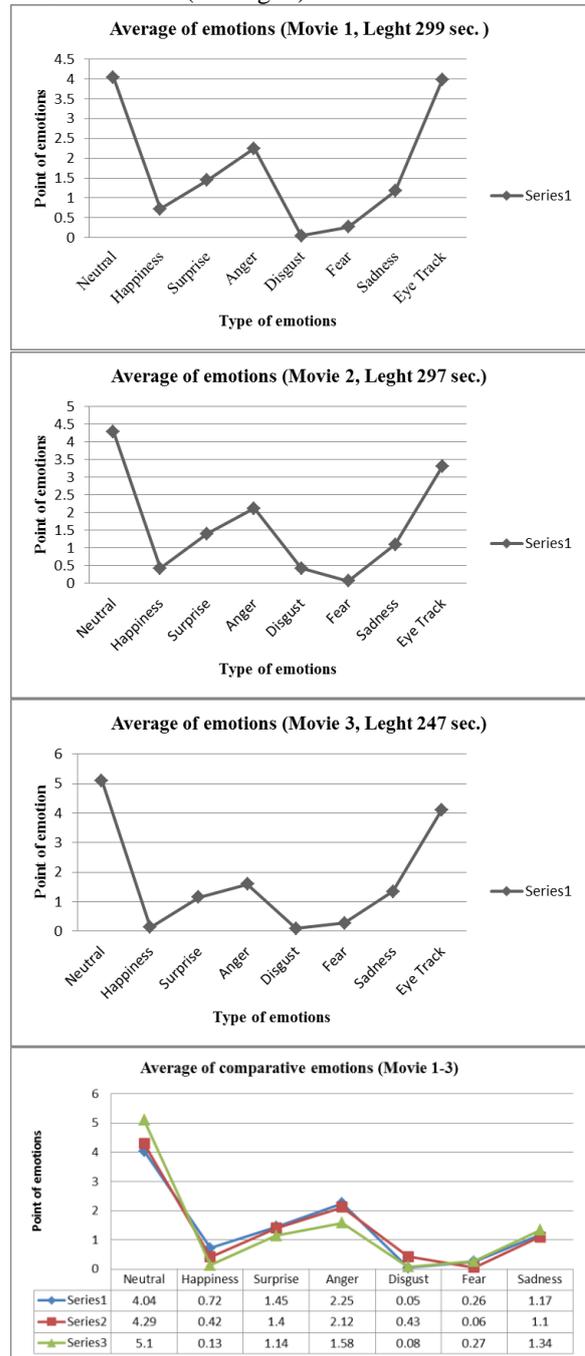


Figure 7. The comparative of emotional scores of three sample movies

### B. Discussion Issue 2

From the comparative scores in the first issue, we also synthesized the frequency of surprise and fear points with the highness score in movie 1 and movie 3. In part of the surprise screens in movie one; we found that in the period of times between 116-133 seconds and 214-299 seconds. Most of camera views were shot out in form of close-up (CU) perspectives such; p1, p2, p3, p4, p6, p7, p8, p9, p10 and p11 (see Fig. 8). Meanwhile, the medium shot

(MS) was presented in p12, p13, p14, p15, and extreme close-up (ECU) was shot in shot p4. This is because most of CU and ECU can be able to blind and limit visibilities of viewers that can be made them always surprises and concentrates with something they could not vision [11].

In part of eye tracking between 116-133 seconds in movie one; we found most of respondents focused their eye around the areas of section 3 and 4 (average points is 3.94) on the screen for examples in; p3, p5, p7 and p8 (see Fig. 8). In addition, in term of mood and tone setting, we analyzed the tone of color system in light setting of movie 1 and found that the cool temperature was employed to control the theme of this scene. The monochromatic and analogous colors were applied to preserve the mood of exciting in this scene [12] (see Fig. 8).

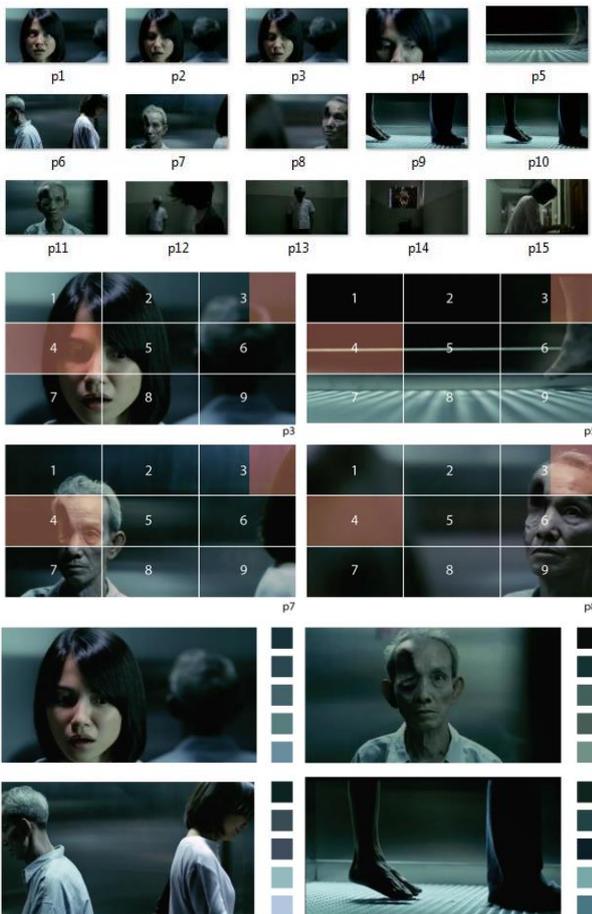


Figure 8. The presentation of camera views, eye tracking position, mood and tone in light setting of movie 1

However, we also analyzed the most of fear feeling with the highness score of movie 3. In this part we focuses the period of time between 202-242 seconds; because these times were the most congestion on the fear feeling from respondents. The analysis of camera views found this scene used of diversity perceptive for example; ECU (p10), CU (p4, p6, p8, p9), MS (p3, p5, p7, p8, p11, p12, p14, p15, p17), and Long shot (p1, p2, p13, p16) (see Fig. 9). In part of eye tracking between 202-242 seconds in movie 3; we found most of respondents focused their eye around the areas of section 3 and 4

(average points is 3.54) on the screen for examples in; p2, p4, p13 and p16 (see Fig. 9). Nevertheless, the using of mood and tone settings found the warm colors were applied to create hot feeling with the viewers. This is because the swift cut of camera shots and hot theme of feeling can be able to oppress the mood of fear in a mental mind [13]. Meanwhile, the monochromatic and analogous colors were also applied to control the mood of panic situations.

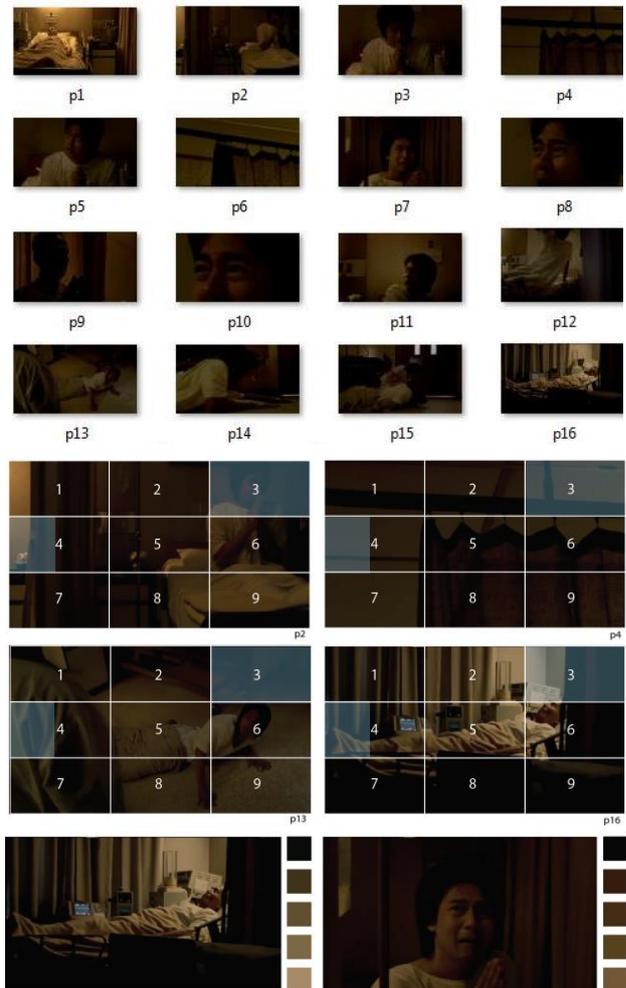


Figure 9. The presentation of camera views, eye tracking position, mood and tone in light setting of movie 3

### C. Suggestions and Recommendations

After finishing laboratory, we found the key suggestions for filmmakers who are interesting to experiment the new alternative design and create the formalism in a horror film setting. After testing, we found the key visual elements which were employed to contribute the attractive art compositions in a horror screen. In term of camera views, we found the often use of CU and ECU perceptive in the horror screen can be able to build the surprise feeling in the sample minds. This emotion occurred when the legible of CU and ECU presents the limiting of visual image on the screens that can be able to make people excited during camera planning; e.g. in p4 (ECU), or p8, p9 and p10 (CU) (in Fig. 8). Meanwhile, the horror composition of camera

setting was employed with several camera views such; ECU, CU, MS, and LS. This is because, the visual language of horror screen prefers to present the perspective of two point of views which represents the perspective of; leading actor and audience who can be able to a holistic situation on the screen.

In part of mood and tone in the horror films, this research found the using of monochromatic and analogous colors were employed to contribute the scary emotion in sample minds. The cool temperature was applied to build the surprising emotion; because, this tone reflects the feeling of peaceful and cold (see Fig. 8). Meanwhile, the warm temperature was employed to stimulate the scary and press of atmospheres directs to the audiences (see Fig. 9).

In term of visual elements, the depth of filed technique can be able to make audiences focus the visual image as a sequence step. This technique often uses with the CU view (such in p1, p2, and p7 in Fig. 8) or ECU view (such p4 in Fig. 8 and p10 in Fig. 9).

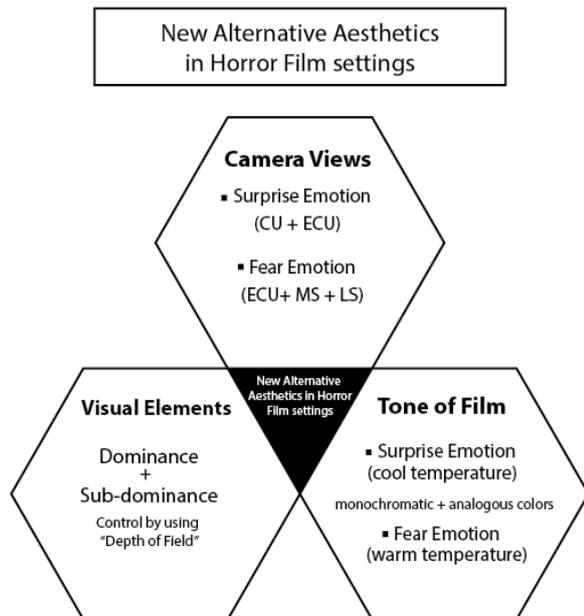


Figure 10. The suggestion of new alternative aesthetics in horror film setting

However, our recommends just one of the new principles in film studies; where we tried to experiment based on the collaborative research paradigm between positivist and constructivist. This collaboration is new being of film principles that are waiting for a film maker take it to apply with their processes. In Fig. 10 presents our idea of new alternative aesthetics in horror film settings.

Finally, this experiment will be able to mostly complete; if we can employ a brain handset to collect the high performance data with measurable activity from all cortical lobes of the brain. This device can provide in depth emotion of human insight. However, our methods can be able to attend with the market research of an advertising agency; when they finish "Television Commercial Advertising" (TVC) or "Video Content" on the social Medias. The technique of face and brain

recognitions could be help them to get more depth-understanding with their customers' insight.

#### ACKNOWLEDGMENT

This experimental base research has been supported and funded by Mahasarakham University. We would like to thank all participants who gave us a time to make the test. Finally, this project would not have been possible without these people and organization as above.

#### REFERENCES

- [1] A. Kuhn and A. Westwell, "A dictionary of film studies," in *Digital Disruption*, D. Lordanova and S. Cunningham, Eds., Oxford: Oxford University Press, 2012, pp. 67-100.
- [2] T. Bywater and T. Sobchack, *An Introduction to Film Criticism: Major Critical Approaches to Narrative Film*, New York: Longman Inc., 1989.
- [3] P. Wiriyasiripatana and A. Natepokaew, "The analysis of narative film: The story of Les Miserables analysis of narrative in the film Les Miserables," in *Proc. Symposium Conducted at the Meeting of The National Conference on Mass Communication and Innovative Management*, Bangkok, 2016.
- [4] J. Hospers. (1954). The concept of artistic expression. *Oxford University Press*. Symposium conducted at the meeting of the Aristotelian Society, Oxford. [Online]. Available: <http://www.jstor.org/stable/4544551>
- [5] S. E., Kahou, et al., "Emonets: Multimodal deep learning approaches for emotion recognition in video," *Journal on Multimodal User Interfaces*, vol. 10, no. 2, pp. 99-111, 2016.
- [6] NVISO. (2011). Say it to my face!: Applying facial imaging to understanding consumer emotional response Symposium conducted at the meeting of the AMSRS National Conference, China. [Online]. Available: [zdoc.site\\_say-it-to-my-face-nviso.pdf](http://zdoc.site_say-it-to-my-face-nviso.pdf)
- [7] R. Rathi, M. Choudhary, and B. Chandra, "An application of face recognition system using image processing and neural networks," *International Journal of Computer Technology and Applications*, vol. 3, no. 1, pp. 45-49, 2012.
- [8] M. Meulders, P. D. Boeck, I. V. Mechelen, and A. Gelman, "Probabilistic feature analysis of facial perception of emotions," *Journal of the Royal Statistical Society Series*, vol. 54, no. 4, pp. 781-793, 2005.
- [9] M. Selvapriya and J. Komalalakshmi, "Face recognition using Image processing techniques: A survey," *International Journal of Engineering and Computer Science*, vol. 3, no. 12, pp. 9704-9711, 2014.
- [10] P. Briñol, R. E. Petty, and Z. L. Tormala, "The availability heuristic and perceived risk," *Psychological Science*, vol. 14, no. 1, pp. 200-206, 2006.
- [11] A. Powell, *Deleuze and Horror Film*, Edinburgh: Edinburgh University Press, 2005, p. 232.
- [12] J. L. Poland, *Camera, Emotion! An Examination on Film Lighting and Its Impact on Audiences' Emotional Response*, Cleveland: Cleveland State University, 2015.
- [13] M. Thomas, *Horror Film Aesthetics: Creating the Visual Language of Fear*, North Carolina: McFarland, 2010.



**Ratanachote Thienmongkol** is an Assistant Professor at Department of New Media, the Faculty of informatics, Mahasarakham University (MSU), Thailand.

In 2014, he obtained his doctorate from Auckland University of Technology, New Zealand with a Thai Royal MSU grant. Currently, he is a Ph.D. in Communication Design who is teaching undergraduate and postgraduate students in Creative Media programs. His academic research focuses on improving the empowerment of visualization for user recognition and reading acquisition based on the Human Centered Design (HCD) concept. The area of his design expertise includes, information design, digital media, wayfinding systems, UI/UX, HCD and visual ergonomics.



**Abdunroni Samaeng** is a researcher assistant at the Creative Media LAB in Faculty of Informatics, Mahasarakham University (MSU). In 2018, he received his Master's degree of Science Program in Creative Media from MSU; and also gained the scholarship from King Bhumibol Adulyadej. In 2017, he also obtained the scholarship from the National Research Council of Thailand (NRCT) to support his master research. In part

of research interest includes; urban transport system, transit map, mobile application, way-finding, UCD/HCD and multimedia Design.