A Video Summarization Technique of Animation Products According to Film Comic Format

Tomokazu Ishikawa *
Tokyo University of Technology

Kento Okazaki
Tokyo University of Technology

Masanori Kakimoto
Tokyo University of Technology

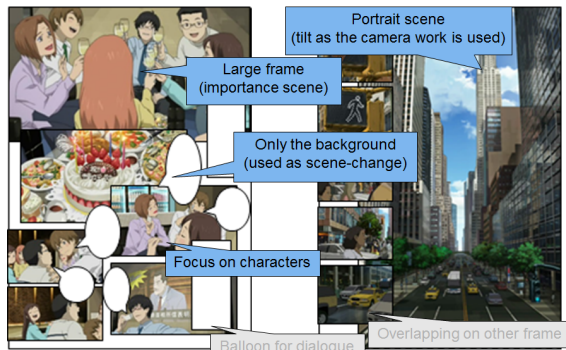Tomoyuki Nishita
UEI Research / Hiroshima Shudo University

Figure 1: *Characteristics of a film comic. We focus on the four characteristics written in the blue balloon. "Eden of The East the movie I - The King of Eden -", ©Asmik Ace, Inc.*

1 Introduction

This research focuses on the book medium that makes it possible to enjoy anime works called film comics in "manga" format. Film comics are produced by the time-consuming task of production editing. Furthermore, we investigated video summaries from anime works that were inspired by comic techniques. In a previous method [Cao et al. 2012], user-specified frames were cut from animation images, leaving only the highly-attractive frames, called keyframes. Meanwhile, the recommended areas were automatically selected based on the four characteristics of the film comics (see Fig. 1). Here, recommended area is the area that should be displayed inside the comic frame, such as character's faces and elaborately drawn backgrounds.

2 Our Method

The proposed method is roughly classified into two processes: "keyframe detection" and "recommended area detection and layout output." The flow of the method is shown in Fig. 2. Keyframe detection is achieved by detecting edges, flesh colors, and sounds in individual frames. Concurrently, camera work detection is used for frame division. Using the quantified features obtained from an image as a comparison, we detect the keyframes not only from pictorial images but also from voice sounds. Changes in scenery are decided by color difference as well as by feature histograms, and keyframes are detected based on the number of edges, region of skin color, and sound volume. Furthermore, tilted scenes are identified by optical flow and adaptation to manga techniques by vector angle.

The shape and size of a frame in comic are determined due to the recommended area detection. Using face area detection, the frame is centered on the character of interest (proposed by

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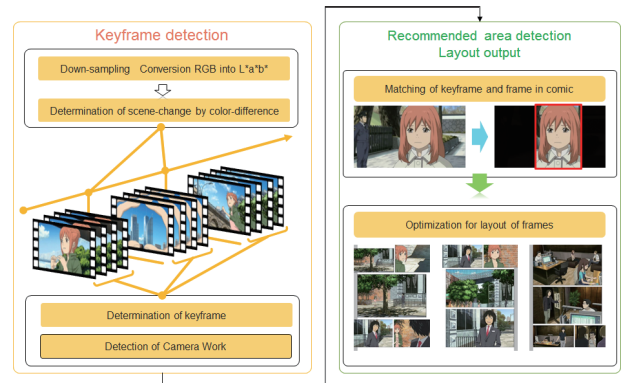
*e-mail: ishikawatm@stf.teu.ac.jp

Figure 2: *Flow of the proposed method. The images are frames in the animation "Eden of The East the movie I - The King of Eden -", ©Asmik Ace, Inc.*

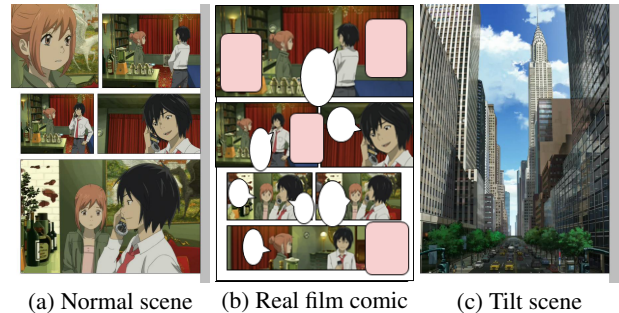(a) Normal scene   (b) Real film comic   (c) Tilt scene

Figure 3: *Results of the layout chart of the animation "Eden of The East the movie I - The King of Eden -", ©Asmik Ace, Inc. (b) is a page from the real film comic "Eden of The East", ©Kenji Kamiyama, Chika Umino.*

Takayama [Takayama et al. 2012]). In layout processing, the frames are matched to the results of the keyframe and recommended area detection, and each domain in the frame is optimized by the least-squares method. The layout image is then output in manga format.

As our result, Figure 3 (a) shows the output image of the layout. For comparison, the layout of the film comic is shown in Figure 3 (b). Figure 3 (c) shows the concatenated result for tilt scenes. We proposed a method for keyframe detection, which is necessary for frames and summarization of images in manga format, with a focus on a book medium for film comics.

References

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TAKAYAMA, K., JOHAN, H., AND NISHITA, T. 2012. Face detection and face recognition of cartoon characters using feature extraction. In *Proc. of Image Electronics and Visual Computing Workshop 2012*, IEVC 2012.