Integration and Presentation of Sequential Visual Information in Dynamic Graphic Design

Siyao Zhang
Faculty of Arts and Design, Zhongyuan University of Technology, Zhengzhou, 450007, China

Abstract: The traditional sequential visual information integration and presentation method adopts the template matching method, and its application in dynamic graphic design will cause the problem of low integration accuracy. For this reason, this paper designs a new method of sequence visual information integration and presentation in dynamic graphic design. On the basis of parameter estimation and background information compensation of dynamic graphics, it realizes the detection and integration of sequence visual information in dynamic graphics, and then realizes dynamic graphic design through dynamic transition and dynamic page. The experimental results show that compared with the traditional method, the proposed method has higher integration accuracy and the information presented is complete and accurate.

Keywords: Dynamic graphic design; Sequence visual information; Information integration; Inter frame difference

1. Introduction

At present, dynamic graphics design based on digital image processing technology is an important branch of computer vision, which involves pattern recognition, digital image processing, artificial intelligence and many other related fields. In dynamic graphic design, the integration and presentation of sequence visual information is a crucial link. It is mainly to effectively detect and integrate the sequence visual information obtained from the graphic scene, and realize the information presentation on this basis [1].

In recent years, with the continuous development of graphics and image processing technology, sequence visual information integration and presentation technology is also becoming mature, and is widely used in modern industry, commerce, medicine, military, transportation system and other fields. Such as the traditional image sequence information integration method based on LSTM and twin network [2]. In this method, SIFT feature matching is used to extract image sequence information, and then LSTM and twin network are used to realize information integration. However, the extraction accuracy of this method is limited to sift template, which easily leads to the problem of low integration accuracy.

Aiming at the disadvantages of traditional methods, this paper designs a new method for the integration and presentation of sequential visual information in dynamic graphic design.

2. Foundation Design

2.1. Dynamic graph Parameter estimation and background information compensation

If we want to realize the integration and presentation of sequence visual information, we need to separate the target information and background information, and compensate the background image to improve the detection accuracy of sequence visual information. Before compensating the background information of dynamic graphics, this paper selects four parameter affine model to estimate the dynamic graphics parameters.

Assuming that the camera sees a still scene, the movement of the graph is caused by the movement of the camera pan tilt. Take the camera as the center to establish the reference coordinate system [3], then:

(1) When the camera has no translation motion, the dynamic change of the image is only determined by the rotation of the camera, and has nothing to do with the depth information of the scene;

(2) When the camera motion contains small translation and the depth of field changes little, the effect is the overall translation and change ratio of the graph;

(3) When the depth of field is very large, the influence of the small translation of the camera on the graphics is very small, which can be ignored;

(4) When the focal length of the camera changes, only the proportion of the image changes;

(5) If the depth of field changes greatly, the camera translation will cause different translation and changes of different parts of the graph, especially the smaller depth of the scene point changes more. When there are moving

objects in the scene, there will be local different motion in the graphics [4-5].

Assuming that the above conditions are met, the motion of a dynamic graph can be approximately determined by four independent variables (scale, rotation, horizontal and vertical translation). After the parameter estimation of dynamic graph is completed, the dynamic background information is compensated [6].

In the process of collecting and designing sequence graphics, once the camera lens moves by translation, rotation or expansion, the motion of the graphic background can be generated on the dynamic sequence of the shot graphics. The mixture of target motion and background motion makes it difficult to detect effective sequence visual information. In order to detect effective sequence visual information from dynamic background graphics, dynamic background information should be compensated. The steps are as follows:

Step 1: Feature extraction. The feature points of the two adjacent frames are extracted and the homography matrix of the two adjacent frames is calculated [7,8].

Step 2: Feature matching. The feature points extracted from the two frames are matched and mapped from the previous frame to the current frame;

Step 3: Filter out the outer points. Remove the useless points on the target to be detected to improve the accuracy of dynamic graphic design. The method is to detect the moving target according to the frame difference and filter the useless points to complete the compensation of dynamic background information.

2.2. Sequence visual information detection and integration in dynamic graphics

Due to the movement of sequence visual information, the gray value of target position changes dramatically. Therefore, in order to reduce the amount of computation, this paper adopts an algorithm based on the first-order norm of the difference vector between frames to detect the sequence visual information in dynamic graphics.

Then, the first order norm of partial derivative vector is used to judge the position of drastic change in gray level.

Because of the movement of the sequence visual information, the gray value of the target position changes dramatically, so the first-order norm of the partial derivative vector can be used to judge the position of the sharp change of the gray level [9]. The number of suspect candidate points can be greatly reduced and the accuracy of detected target points can be higher by segmentation of pixel points with drastic change in gray level.On this basis, the sequence of visual information detected is integrated and presented, that is, the optimal matching of patterns is sought in the next frame of image, and the whole multiple moving targets [10].

3. Dynamic Graphic Design

Depending on how dynamic graphics are used, the way they are implemented varies. For example, some regular motion state, usually with static graphics with program code to achieve; In some complex dynamic forms, dynamic graphics should be inserted into the design. The dynamic graphic design can be divided into transition dynamic and page dynamic by analyzing the scene of the existing dynamic graphic application.

3.1. Transitions dynamic

The word "transition" first appeared in the field of film and television design. By adding special effects techniques to two picture clips to complete the transformation of scenes, its performance in film and television generally includes overlapping, fading in and out, page turning and other ways. One of the most important characteristics of the transition dynamics is that the whole interface changes in time and space. As the space in the interface is limited, more information content will be hidden behind the current screen or left, right and bottom. The dynamic switching between the two groups of information content can bring users a sense of spatial reorganization in visual experience. Transition dynamics are provided by the official dynamic API, some simple dynamic effects can be directly called to complete the official dynamic API. The transition dynamic form is shown in Figure 1.

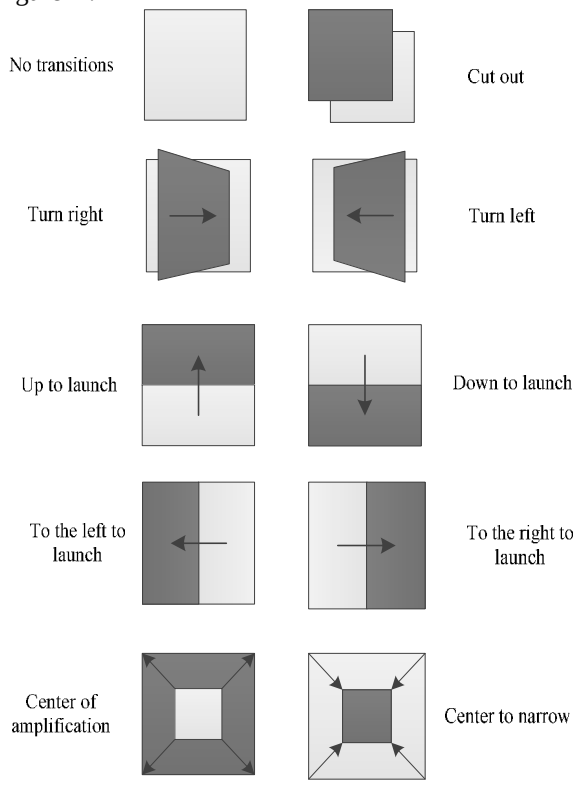

Figure 1. Several typical transition dynamic forms

The transition dynamics are presented in different directions in the same form of expression, and the delivery is closely related to the interaction behavior of users. Therefore, in the design of transition dynamics, it is necessary to conform to the psychological anticipation of users.

3.2. Page dynamic

Dynamic page is the most widely used type of dynamic in graphic design, to achieve such dynamic rely mainly on the background program, compared with the past through the Flash player to achieve dynamic graphics, users no longer need to load the Flash player, in use process can directly through the code for the browser's support to implement dynamic, not because of the dynamic load appears caton images, have a wider usage scenario.
Compared to the transition dynamic and specific form of expression, page dynamics can only be expressed in the basic form of expression. However, with several of these dynamic applications superimposed on each other, it is possible to synthesize many rich variations of our interface applications.
The dynamic form of the page is shown in Figure 2.

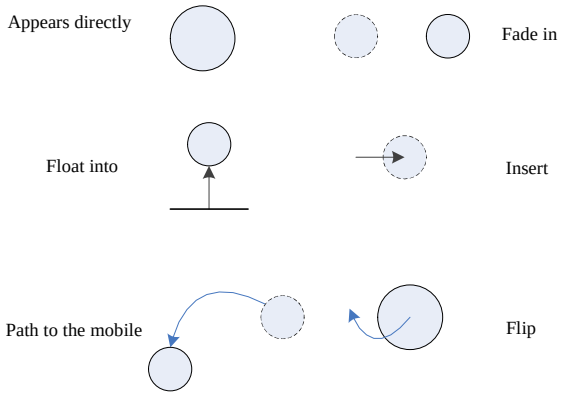

Figure 2. Several typical dynamic forms of a page

4. Performance Test Experiment

4.1. Experimental content

In order to verify the practical application performance of sequential visual information integration and presentation method in dynamic graphics design, the following simulation experiments are designed.
In order to ensure the validity of the experimental results, the traditional image sequence information integration methods based on LSTM and twin network are compared. According to the following experimental process, through the comparison between the two methods, the experimental data and conclusions are obtained, and the performance verification is completed.

4.2. Experimental process

Two kinds of information integration methods are used to process the sequence visual information of the same dynamic graph. The integration accuracy is compared, and the performance of different methods is evaluated from the theoretical and practical application effects.
A sequence was randomly selected from the image database as the experimental object, and the motion speed and target interference items of sequence visual information in dynamic graphic design were continuously increased. The method proposed in this paper and the traditional method were used to integrate the sequence visual information in the experimental image sequence, and the integration accuracy of the two methods was compared. The experimental data were analyzed synthetically, and the final experimental conclusion was obtained.

4.3. Experimental results and analysis

The two methods are applied to the integration accuracy of sequence visual information in dynamic graphic design and after rendering, and the results are shown in Figure 3.

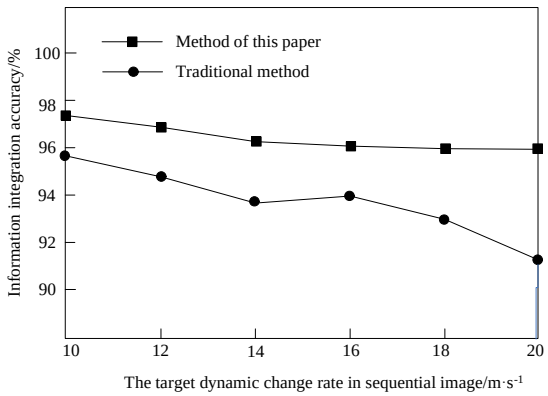

Figure 3. Comparison of integration accuracy

By comparison and analysis of Figure 3, it can be seen that with the continuous increase of the speed of sequential visual objects in dynamic graphic design, the integration accuracy of traditional methods is decreasing, while the integration accuracy of the method in this paper is decreasing, but the decrease is small, and the whole remains at a relatively stable level. The above data show that the method in this paper has higher integration accuracy and better information presentation effect.

5. Conclusion

The integration and presentation of sequential visual information in dynamic graphic design is a major research direction in the field of computer vision. It has broad research and application prospects in many fields such as visual navigation, intelligent monitoring, human-computer interaction and security monitoring. In this

paper, a new method of sequence visual information integration and presentation in dynamic graphic design is studied, and its application advantages of high integration accuracy are verified. In the following research, we will do further research on this method in order to expand the scope of application of the method.

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