A Study on Generating Stained Glass Animation from Video Clip

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Abstract

This paper presents a way to generate a stained glass animation from a given video input. We first obtain low-frequency components from input video frames to get rid of textures which cause over-segmentation in image segmentation. Then we segment input video volume by employing mean-shift video segmentation. The segmented regions are too large to be architecturally stable, subdivision is required. To sub-divide regions temporally coherent, we obtain the panoramic image from the segmented regions, and sub-divide them by using weighted Voronoi diagram. To render these sub-divided regions as stained glass pieces, we find the best match glass piece in the real stained glass piece image database and transfer its color to that region. Finally, we generate lead came at the boundary of regions, which results in a temporally coherent stained glass animation.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed.

However, the manuscript can be downloaded and accessed as a PDF.

Figures

Figure 1

Decomposing input video frames for getting low-frequency components.

Figure 2

Temporally coherent video segmentating using low-frequency components of video frames.

Figure 3

Temporally coherent video segmentating using low-frequency components of video frames.

(a) Weighted Voronoi diagram on the synthesized panoramic image

(b) Weighted Voronoi diagram on the region in frame #1

(c) Weighted Voronoi diagram on the region in frame #2

(d) Weighted Voronoi diagram on the region in frame #3

Figure 4

Temporally coherent regions sub-divided by using weighted Voronoi diagram.

Figure 5

Sample images in our real stained glass image database.

(a) Color transfer

(b) The glass filter

(c) Lead came

Figure 6

Stained glass rendering.

Parameters ^a	Notes ^a	Values ^a
D_r ^a	Spatial range thresholds ^a	4 ^a
D_s ^a	Color range threshold ^a	8 ^a
t ^a	Time threshold ^a	5 ^a
M ^a	The minimum number of pixels of a segment in each frame. ^a	80 ^a

Figure 7

The value of parameters used in this paper.

Figure 8

Stained glass layout generation

(a) An input video frame

(b) The low-frequency components of input video frame

(c) Segmented regions

(d) Sub-divided regions

(e) Color-transferred result

(f) Glass-filtered result

(g) Final result with lead came

Figure 9

Stained glass rendering & animation process proposed in this study.

Figure 10

Various stained glass animation results.

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

(i)

(j)

(k)

(l)

Figure 11

Stained glass animation results.