

A Heuristic Technique for Collage Generation using a Hybrid Imaging Concept for Inter Image Transitions

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There are several different ways to make a collage from a certain number of images using an algorithm but most of them produce repetitive and observable patterns when used. We try to generate a rather heuristic method to combine images and form a collage that does not distort the images and also does not make a normal grid to support the collage. In our technique it depends on the order in which the images are provided and there orientation to determine the collage grid that is generated.

1 Processing Method for Images

We store all the images in a cell array and keep on pairing two images at a time. After parsing through the array once we get images that are made by two images. We then parse the array of these images again. This leads to a merge sort type algorithm which ensures that none of the images are too small and diminished compared to others. We process two images at a time and ensure that the cardinality of both the images is the same. By cardinality we mean that the number of images used to construct that particular image. We call the function `CreateHybridImage()` on these images two at a time.

2 Creating Hybrid Images

We now have two images with us to be combined in a suitable manner according to their orientation and sizes. First we calculate their orientation. Depending on which we decide which type of processing is to be done on them. There are four different cases here.

2.1 Both images with Landscape orientation

In this case as both of the images are landscape. We first resize them such that their width is matched to the average of their width while maintaining the aspect ratio of both of the images. We then merge the images vertically. We use the method called `VerticalProcessing` to implement this. After resizing we use the method `hybridFormation` to merge the images.

2.2 Both images with Portrait orientation

In this case as both of the images are portrait, we first resize them such that their height is matched to the average of their height while maintaining the aspect ratio of both of the images. We then merge We images horizontally. use the metthethod called `HorizontalProcessing` to implement this. After resizing we use the method `hybridFormation` to merge the images.

2.3 One of the image is landscape and other is portrait

Here there are two possibilities. We define the orientation measure as the ratio of width and height. The two cases that are possible here are if the orientation measure of the landscape image is higher than the reciprocal of the orientation measure of the portrait image or lower.

In the first case we use `VerticalProcessing` as the landscape image is more skew compared to the portrait one so to preserve the aspect ratio and the value in size of the more skew image we resize the images such that their width matches the average width and combine them vertically which conserves their aspect ratio and size in the final image.

In the second case we use `HorizontalProcessing` as the portrait image is more skew compared to the landscape one so to preserve the aspect ratio and the value in size of the more skew image we resize the images such that their height matches the average height and combine them horizontally which conserves their aspect ratio and size in the final image.

3 Bounding Box

In vertical processing we define the bounding boxes to be the 20 percent of the height of the image with smaller height. Similarly we define it



Figure 1: Here in the image it can be easily seen that the edges and details in the second image are conserved and merged with the blurred ending of the first image.



Figure 2: The final result obtained on running our algorithm with 7 different input iamges.

for width in horizontal processing. The bounding boxes are taken at the end and the start of the two images respectively and then they are merged using the `hybridFormation` function. We provide the two images with their bounding box as the arguments to the function

4 Hybrid Formation

In the hybrid formation we follow the given steps:

1. We blur the bounding box part of the first image.
2. Sharpen the bounding box part of the second image by subtracting the blurred form from the original image. It leaves it with important edges and details.
3. We copy the rest of the images at the start and end of the new output image.
4. In the overlapping part we use the below explained method to make a good transition effect which can also be called the hybrid image result from the two images.

4.1 Blending the two Images

We use the fading in out method to add the two images in the bounding box part. We add the blurred first image to the sharpened second image. This results in a hybrid image which conserves the details and merges the two images in an aesthetic manner. Figure 1 shows the resultant image of merging of two images and it is evident from the results.