Students:

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Digital Image Analysis

Image and Video Retargeting

1. Image Retargeting

1. Paper Implementation:

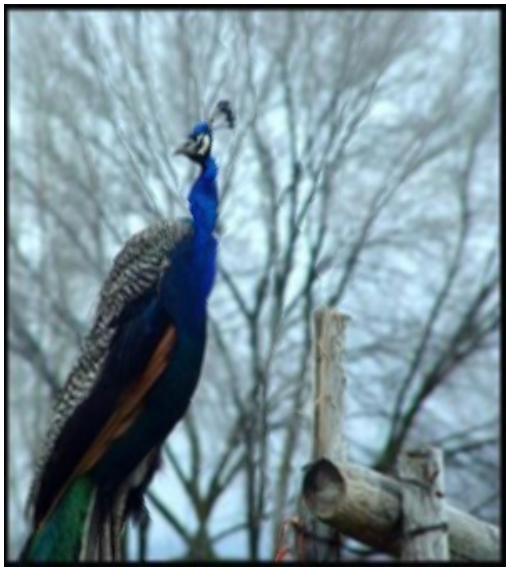
   Converted an image to a graph using PyMaxflow and applied maxflow/min-cut algorithm to find the top 25% seams and removed them from the image to get retargeted image.
   For seam removal, we always remove the left end node of the min-cut and then we reconstruct the graph for the next iteration.
   We used forward energy as specified in the paper.
   The above process is repeated till we reduce the width by 25%.

Original

Retargeted

Original

Retargeted



Original

Retargeted

2. Extension using texture synthesis:

Method1 is using seam carving directly on original image and Method2 is using seam carving on processed image.

Original

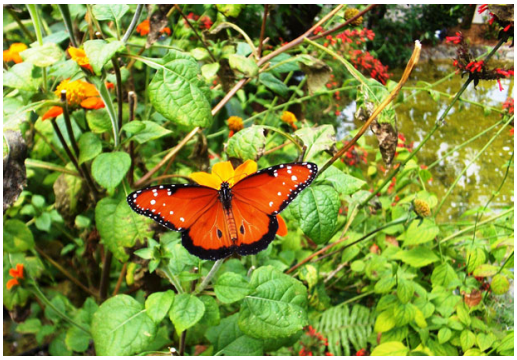
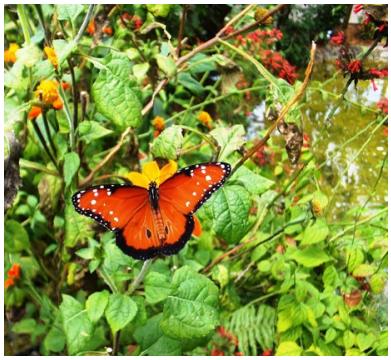
Method1

Method2

Original Method1 Method2



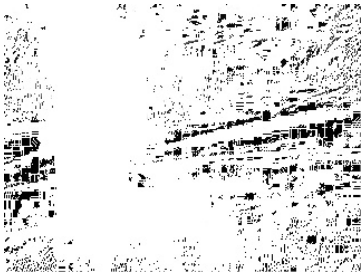
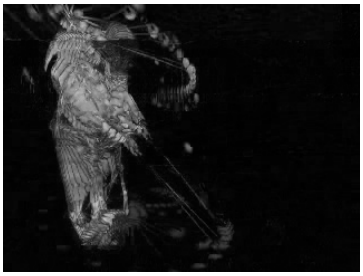
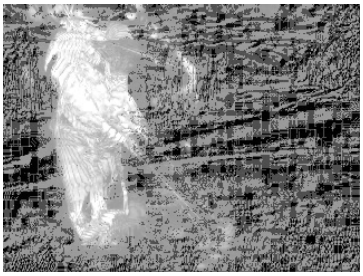
Original Method1 Method2

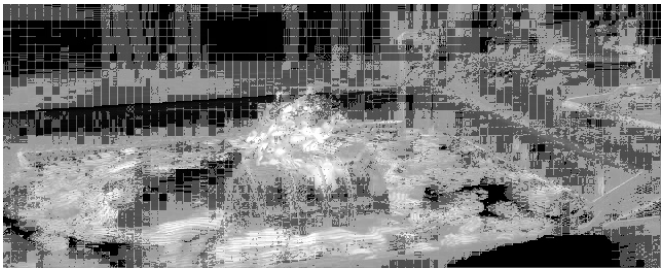




2. Video Retargeting

1. Paper Implementation:
   As asked in the assignment, we have implemented video retargeting in three ways.
   1. Trivial Method: In this method, we extracted each frame and retargeted it independently and then stitched all retargeted frames to form a video.

   2. Static Seam: In this method, as mentioned in the paper, we calculated spatial, temporal and spatiotemporal energy projections and then formed a single image of this energy and then removed seams using seam carving as mentioned in image retargeting keeping energy image as reference.
      Following are energy images used to get static seams:



3. 3D graph cut: In this method, we created a 3 dimensional graph with width, height and frame as dimensions and connected them as mentioned in the paper. We then found out 2D seam and removed it to get retargeted video.

All the videos are available in the output files folder.