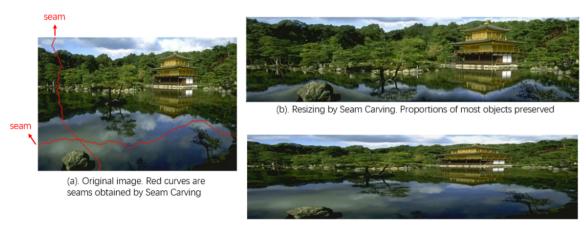
## **Project 1: Image Editing**

## 1 Background

Image editing is the process of altering or enhancing digital images using various techniques, which has a wide range of application scenarios in real life. Relevant techniques includes image resizing, image cropping, image matting, image synthesis and so on.

Seam carving is an algorithm for content-aware image resizing. It functions by establishing a number of seams (paths of least importance) in an image and automatically removes seams to reduce image size or inserts seams to extend it, see Fig. 1. Seam carving also allows manually defining areas in which pixels may not be modified, and features the ability to remove whole objects from photographs.



(c). Resizing by changing scale along horizontal axis. Proportions of objects collapsed

Figure 1: Seam Carving

## 2 Goal

In this project, you are asked to implement image editing follow these steps:

• There are two given pictures imges/background.png and imges/object.png, see Fig 2 and Fig 3. Expand background.png using Seam Carving to ensure enough space between characters, see Fig 4. For appropriately resizing the image without distorting

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the cartoon characters, you may need to get the mask of the characters using image matting skills and use the mask in Seam Carving.

• Using conventional image matting algorithm you like to get the foreground from object.png, see Fig 5, for evaluation, you can use GT/mask.png. The foreground image you get need to be cropped for further operation.

• Using conventional image synthesis algorithm you like to integrate the foreground into the expanded background image you got previously, see Fig 6.



Figure 2: background.png



Figure 3: object.png



Figure 4: expanded image using seam carving

## 3 Notes

Attention: Algorithms used for image resizing and matting should be implemented by yourself, otherwise your rating will be negatively affected

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Figure 5: foreground



Figure 6: foreground

For implementation details of Seam Carving, you can refer to Seam carving for content-aware image resizing.