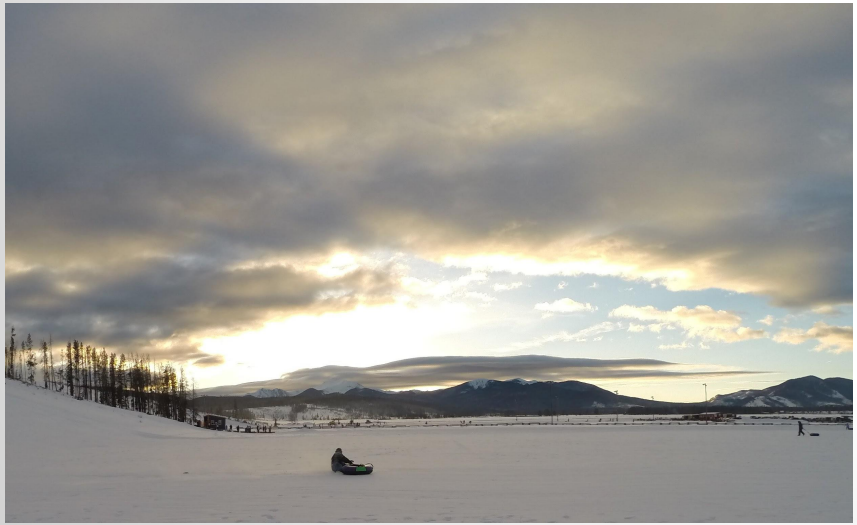
Comp Photography (Sp 2015)
HW 6

Jonathan Hudgins (jhudgins8)

Source Images

I wanted to combine summer and winter, beach and mountains. It was important to use images with similar apparent scale. I cropped the images manually so that the horizon (snow and ocean) would be at same relative y-coord. Then I programmatically scaled the winter image to have same dimensions.



Final Image

Can you identify the seam?

There are several ghosting artifacts that could be removed by a more customized mask, but the mountains are completely indistinguishable.

Mask

My goals in creating a mask were:

- capture the magnificent sky -- especially from the winter photo
- capture the palm tree from the summer photo
- ensure seamless blend

I programmatically:

- created a 100x100 image
- filled right of line starting 2/3rds width on top to 1/3rds width on bottom
- blurred with sigma 10
- scaled mask (lanczos4) to match dimensions of source images

reduce

- generate kernel as specified (parameter 0.4)
- convolve2d image with kernel
- subsample using np.ix_ -- which efficiently selects [(0,0), (0,2), … (0,width)], [(2,0), (2,2) …] ...

expand

- use kron with [1, 0],[0,0] to increase the matrix size
- generate kernel
- convolve image and kernel
- multiply image entries by 4 (because ¾ of values in expanded matrix were 0)

gaussPyramid

for each image append reduced image

laplPyramid

for each image:

- expand next image
- crop expanded image
- append delta of image and cropped-expanded image to result list

blend

- use np.multiply to element-wise multiply mask and white image (and 1-mask for black image).
- sum the masked images

collapse

- for image in images reversed (smallest to largest)
  - expand current output
  - crop expanded
  - output = image + cropped