P1 Writeup

the process

I knew that the element wise multiplication would be easiest to do with two matrices of the same size so I constructed an image sized matrix of filter-sized neighborhood matrices and an image sized matrix of rotated filter matrices. I extracted the neighborhoods with slicing indices; to make indexing over the padding easier, I added equal padding on both sides, equal to the greater of the width and height. I was also sure to throw an error for even sizezd filters as per specifications.

production of extra credit

I used a for loop to produce the hybrid images of the dog and cat at each frequency from 1-7:

```
for i in range(1, 8):
  cutoff_frequency = i
  low_frequencies, high_frequencies, hybrid_image = gen_hybrid_image(
    image1, image2, cutoff_frequency)

  vis = vis_hybrid_image(hybrid_image)
  plt.figure(figsize=(20, 20)); plt.imshow(vis);

  save_image('../results/hybrid_image_scales'+str(i)+'.jpg', np.clip(
    vis, 0, 1))
```

the GIF

available online: https://imgur.com/a/TX8wdmR