**Introduction & Problem**

- **Image Inpainting**
  - A task which fills missing pixels with semantically and perceptually plausible contents.
- **Problem**
  - Many inpainting methods give blurry or awkward images. From this project, I will generate clear and plausible outputs to improve image quality.

**Dataset**

- **CelebAHQ**
- **Places365**

**References**

1. Yuqing Ma, Xianglong Liu, Shihao Bai, Lei Wang, "Coarse-to-Fine Image Inpainting via Region-wise Convolution and Non-Local Correlation" in Twenty-Eighth International Joint Conference on Artificial Intelligence, 2019

**Methods**

- **Recurrent Convolution**
  - Implement RNN structure by using buffer
  - Reduce the network size & solve gradient vanishing
- **Sobel Edge Discriminator**
  - Sobel edge discriminator distinguishes real and fake edge map of generated image and the ground truth
- **Frequency Separation Loss**
  - Coarse Route: L1 loss of low pass filtered image
  - Refine Route: L1 loss of high pass filtered image

**Experimental Results**

- **Face**
- **Background**

**Conclusion**

- **Analysis**
  - My model produces better outputs than other methods for both face and place dataset. The outputs are more natural and give better PSNR, SSIM, and Loss
- **Future Work**
  - However, there are some cases which coarse outputs are better than refine outputs. There might be a problem with refine network. Hence, the refine module can be modified to solve this issue.