Image Synthesis Using Deep Learning

Student: Nikhil Wani
Department of Computer Science
Email:wanin1@udayton.edu
Advisor: Dr. Tam Nguyen

Nikhil Wani

Introduction

Purpose of this research is to generate realistic image from hand drawn sketch by human. The generated image will be some image, photorealistic or non-photorealistic.

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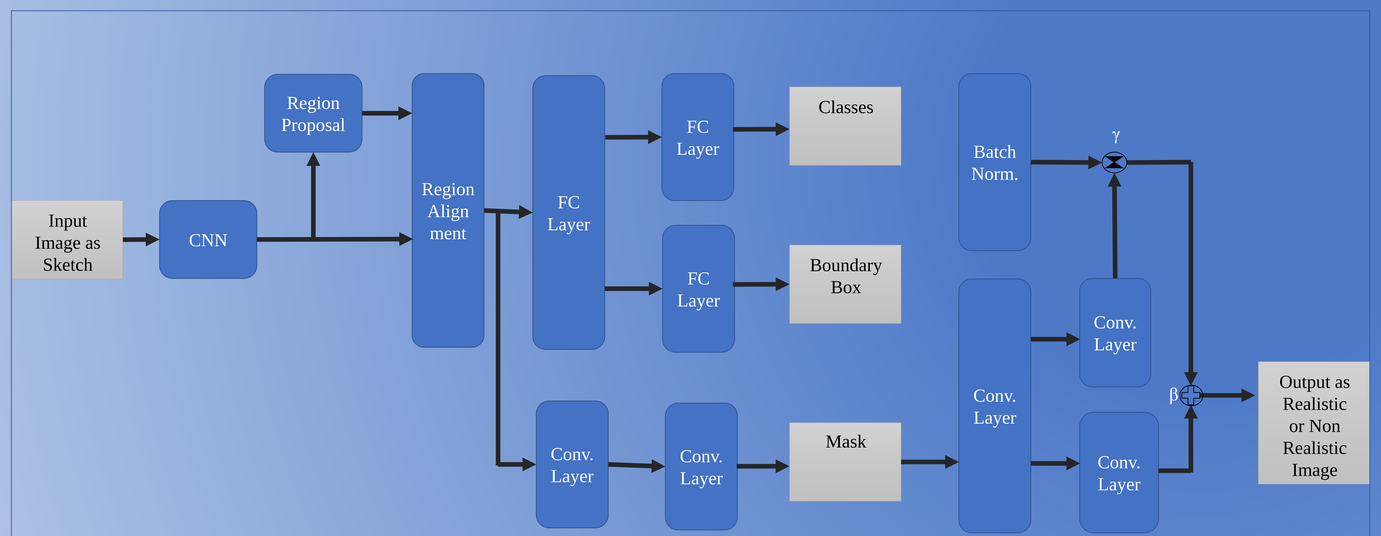
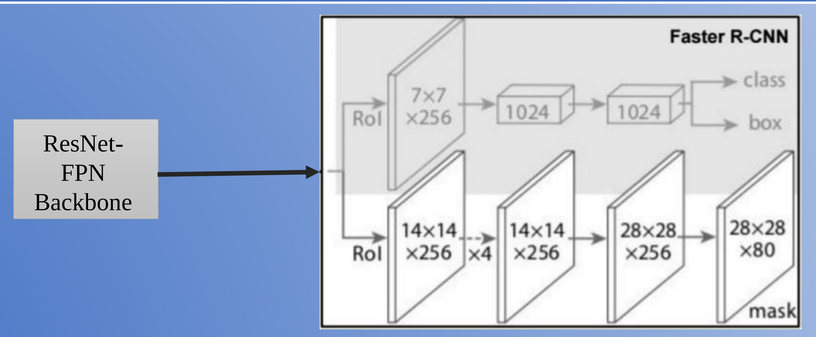
Proposed Framework



Mask R-CNN

- Framework performs object detection in parallel with generating high-quality segmentation mask on each Region of Interest (RoI).
- Backbone: ResNet-101 with Feature Pyramid Network(FPN) extracts RoI.
- Head: applied separately to each RoI.
  - Faster R-CNN – Bounding Box Recognition.
  - Mask – Segmentation.

Head Architecture



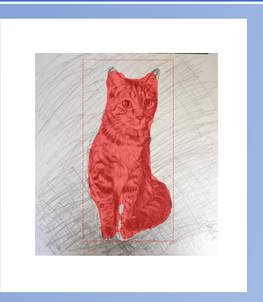
Training

- Initialize with pre-trained weights on MS COCO.
- Mini-batch size:64

Two-stage training

- Head only: 15 eposhs,0.001 learning rate.
- All layers: 20 epchs,0.0005 learning rate

Results



References

1. https://github.com/facebookresearch/Detectron
2. https://github.com/matterport/Mask_RCNN
3. https://github.com/NVlabs/SPADE
4. https://github.com/nightrome/cocostuff