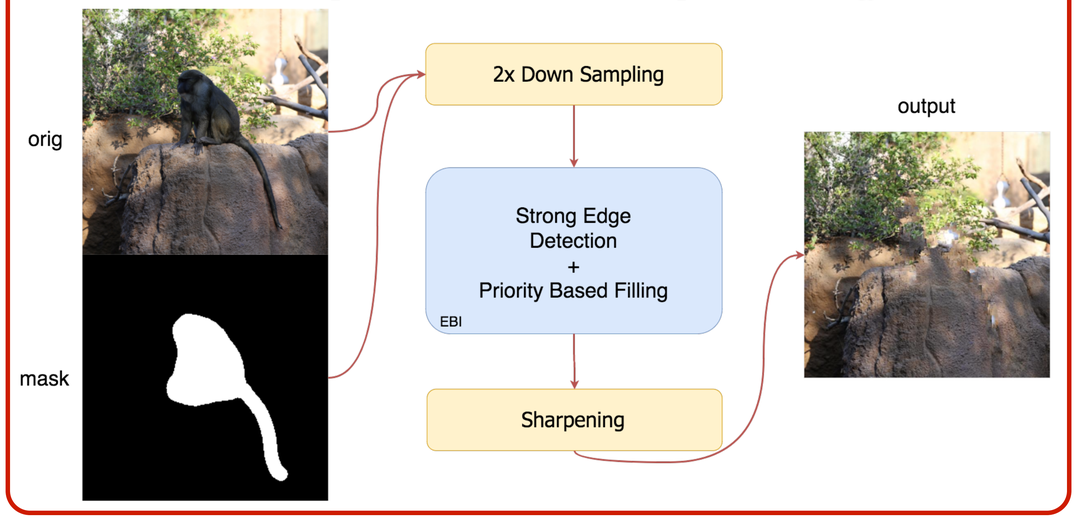
Evaluation of Image Completion Algorithms: Deep Convolutional Generative adversarial Nets vs. Exemplar-Based Inpainting

Koki Yoshida, Chanduo Huang
Department of Computer Science, Stanford University

Motivation

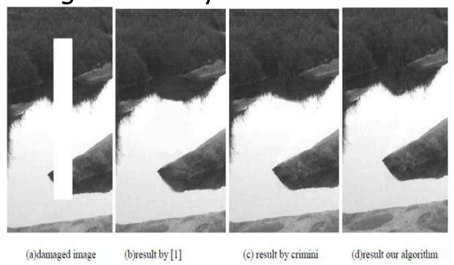
- Image completion (inpainting) is an active topic in CV research that has numerous applications: picture restorations, scene reconstruction, etc.
- Although countless number of algorithms engineered, comparisons between different inpainting algorithms are rarely highlighted
- We strive to give a clear and in-depth analysis of two of the representative and groundbreaking algorithms used for inpainting: DCGAN and Exemplar-based inpainting

Exampler-Based Inpainting

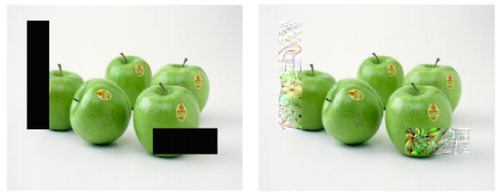


Related Work

1. "Review of Different Inpainting Algorithms" by Patel et al.



2. "Image Inpainting Through Neural Networks Hallucinations" by Fawzi et al. (focuses on image inpainting techniques with pre-trained networks)



3. "Mask-specific inpainting with deep neural networks" by Schuler et al. (presents techniques for directly mapping the masks to their corresponding image patches)

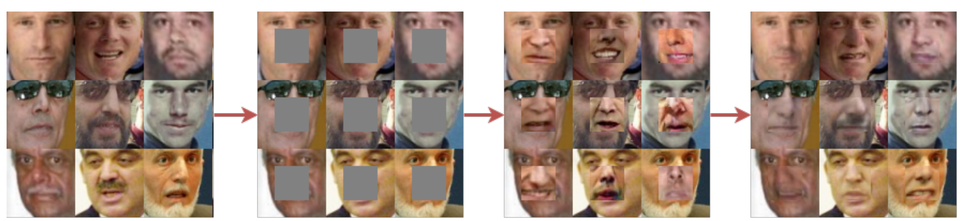
DCGAN Architecture

Direct Comparison

	Src Images	Quality	Runtime	Applications
EBI	Works on unseen images	Depends on content and mask	Faster. Quality independent of time	Real time classfication. Small patches
DCGAN	Limited to trained genres	Stable. Generally good and smooth	Slower. Quality improves with time	Content aware filling. Scene reconstruction

DCGAN Sample Output

*Network trained on LFW dataset



Refs:

1. "Object/Defect Removal via Single-image Super-resolution on NLM-priority-based Inpainting and Sparse Coding" by Xu et al.
2. "Image Completion with Deep Learning in Tensorflow" by Amos, Bamos
3. "Unsupervised Representation Learning with Deep Convolutional Generative Adversarial Networks" by Radford et al.