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

Exemplar-Based Inpainting

DCGAN Architecture

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)

Direct Comparison

<table>
<thead>
<tr>
<th>Src Images</th>
<th>Quality</th>
<th>Runtime</th>
<th>Applications</th>
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<tbody>
<tr>
<td>EBI</td>
<td>Works on unseen images</td>
<td>Depends on content and mask</td>
<td>Faster. Quality independent of time</td>
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<tr>
<td>DCGAN</td>
<td>Limited to trained genres</td>
<td>Stable. Generally good and smooth</td>
<td>Slower. Quality improves with time</td>
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</tbody>
</table>

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, Barros