Local Facial Attribute Transfer through Inpainting

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Our goal is to build a system that effectively performs attribute transfer.
We propose to formulate local attribute transfer as an inpainting problem.

Our model ATI-GAN: Attribute Transfer Inpainting Generative Adversarial Network

Previous methods [1,2]
- generating new images (global)

Our approach
- generating new patches (local)

ATI-GAN is able to utilize local context information to focus on the attributes while keeping the background unmodified resulting in visually sound results.

Our model is composed of a Reconstructor, a Generator and a Discriminator.
Evaluating ATI-GAN results

We train ATI-GAN on the CelebA dataset which consists of ~200K celebrity face images with variations in facial attributes.

**Evaluation of inpainting results:**

<table>
<thead>
<tr>
<th>Method</th>
<th>PSNR (dB)</th>
<th>SSIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIIWGAN [27]</td>
<td>19.20</td>
<td>0.920</td>
</tr>
<tr>
<td>SIIDGM [10]</td>
<td>19.40</td>
<td>0.907</td>
</tr>
<tr>
<td>CE [19]</td>
<td>21.30</td>
<td>0.923</td>
</tr>
<tr>
<td>GL [4]</td>
<td>23.19</td>
<td>0.936</td>
</tr>
<tr>
<td>GntInp[12]</td>
<td>23.80</td>
<td>0.940</td>
</tr>
<tr>
<td>GMCNN [28]</td>
<td>24.46</td>
<td>0.944</td>
</tr>
<tr>
<td>GL+LID[29]</td>
<td>25.56</td>
<td>0.953</td>
</tr>
<tr>
<td>ours</td>
<td>31.80</td>
<td>0.946</td>
</tr>
</tbody>
</table>

**Evaluation of attribute results:**

![Graph showing accuracy for different attributes (Smiling, Eyeglasses, Old, Mustache)]
Results

ATI-GAN formulates attribute transfer as an inpainting problem.

Thank You!