**Colorization of Luminance Image Examples**

**Introduction**

**Goal**
Remove spatially varying color casts from images.

**Intuition**

1. Deep learning methods colorize luminance (greyscale) images quite believably.
2. Colorization methods must be encoding knowledge of the world (i.e., sky is blue).
3. Colorization works for luminance, so why not add color channels too?
4. Hypothesize that encoded world knowledge will help remove unnatural color casts.

**Colorization of Luminance Image Examples**

**Network Architecture**

- **Architecture used is a variation on that of Johnson et al. [2]**

**Example Results**

**Training and Test Sets**

- Large datasets of images under spatially-varying illumination do not exist.
- Synthesized applying spatially-varying scaling (von Kries) to R and G channels.
- Used COCO images. 50,000 for training, 10,000 for testing.
- Linear variation across image.

**Median Angular Error Over All Pixels**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Median Input -&gt; Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUS Canon</td>
<td>7.9 -&gt; 6.1</td>
</tr>
<tr>
<td>NUS Fujifilm</td>
<td>7.3 -&gt; 4.8</td>
</tr>
<tr>
<td>NUS Nikon</td>
<td>7.2 -&gt; 4.4</td>
</tr>
<tr>
<td>NUS Samsung</td>
<td>7.0 -&gt; 3.8</td>
</tr>
<tr>
<td>NUS Sony</td>
<td>7.2 -&gt; 4.7</td>
</tr>
<tr>
<td>MS COCO</td>
<td>7.0 -&gt; 3.9</td>
</tr>
</tbody>
</table>

**Conclusion**

- Significantly reduces spatially-varying color casts.
- End-to-End processing.
- Eliminates traditional illumination-estimation step.

**References**


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For source code and paper scan →