Learning Isometric Surface Parameterization for Texture Unwrapping

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Current neural shape representation approaches:
- Do not allow a surface parameterization.
- Do not allow editing or re-texturing of the surface.
Document unwarping is a special case of texture unwrapping of an isometric surface:
- Prior unwarping methods need a large paired dataset.
- Utilizes single image, geometrically under constrained.

Motivations

Learn a surface parameterization for implicit neural representations using multi-view images and a texture mapping prior.

Proposed method can be effectively used for document unwarping task by learning a prior for texture mapping on the document shape.

We show superior results in unwarping and texture editing tasks:
- Better (+25%) and stable local distortion (LD), across different views.
- Better (+25%) OCR Performance.
- Better than NeuTex [3], a method for texture editing with NeRFs.

Contributions

<table>
<thead>
<tr>
<th>Method</th>
<th>Task</th>
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<tbody>
<tr>
<td>NeRF</td>
<td>✓</td>
</tr>
<tr>
<td>IDR [1]</td>
<td>✓</td>
</tr>
<tr>
<td>Ours</td>
<td>✓</td>
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</tbody>
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References:

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