Neural Puppet: Generative Layered Cartoon Characters
Omid Poursaeed, Vladimir G. Kim, Eli Shechtman, Jun Saito, Serge Belongie

**Motivation:** Animating 2D characters requires extensive manual effort

**Goal:** Learning to animate characters with minimum expert supervision
- The user provides a set of unlabeled images and a layered template mesh
- The model generates in-between frames and constrained deformations

**Approach:**
- Template-based mesh deformation based on input pose
- Refining the rendered image with a GAN

**Architecture:**

**Results:**

**Interpolation:**

**User-constrained Deformation:**

**Correspondence Estimation (PCK):**

<table>
<thead>
<tr>
<th></th>
<th>α = 0.1</th>
<th>α = 0.05</th>
<th>α = 0.025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ours</td>
<td>67.18</td>
<td>46.39</td>
<td>24.17</td>
</tr>
<tr>
<td>UCN</td>
<td>67.05</td>
<td>43.84</td>
<td>21.50</td>
</tr>
<tr>
<td>PWC-Net</td>
<td>62.92</td>
<td>40.74</td>
<td>18.47</td>
</tr>
</tbody>
</table>