Pixel-Level Domain Transfer

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Motivation

- Put mental imagery into AI.
  - Train a converter $C(I_S|θ_C)$.

Contributions

- Proposing the first framework for semantically transferring a source knowledge to a target domain in pixel-level.
- Proposing a novel discriminator that enables us to train the semantic relation between domains.
- Building a large clothing dataset expected to contribute to domain adaptation researches.

Architecture

Generative Adversarial Nets

[Goodfellow et al., NIPS’14]

LookBook Dataset

- Fully paired 77,546 images in total.
- 8,726 product images.
- 68,820 fashion model images.
(Available at https://dgyoo.github.io/)

Generation Results

Quantitative evaluation

<table>
<thead>
<tr>
<th>Methods</th>
<th>User study score</th>
<th>Pixel-level (dis)similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Realistic</td>
<td>Attribute</td>
</tr>
<tr>
<td>C+RF</td>
<td>0.40</td>
<td>0.21</td>
</tr>
<tr>
<td>C+MSE</td>
<td>0.28</td>
<td>0.60</td>
</tr>
<tr>
<td>C+RF+DD (Ours)</td>
<td>0.82</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Human → product generation

Product → human generation

Less-variant to varying source conditions