Generating websites from mockups using GANs
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Abstract
Front-end web development is a creative process, frequently involving transformation of UX mockups into code. Recent studies in GANs have experimented with generating images of nature and everyday items. This study explores the application of GANs in applying style transfer on websites, particularly in transferring fonts and colors across different style domains.

Dataset and Features
Amazon-Flipkart Data
- 512 * 512 RGB screenshots
- 10,718 screenshots total, with 10,000 in train set and 718 for dev.
- Images scaled and cropped to 64 * 64 for preprocessing and augmentation.

Custom table & font data
- 300 * 300 tables with fonts
- 10,950 images total with 10,000 in train set and 950 for dev.
- Images scaled and cropped to 224 * 224 for preprocessing and augmentation.

Model and Results
Our model is based on CycleGAN by Zhu, Park, et.al
We present an analysis of results below.

<table>
<thead>
<tr>
<th>Model</th>
<th>Epochs</th>
<th>Loss</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>200</td>
<td>0.974</td>
<td>Original</td>
</tr>
<tr>
<td>Pretrained</td>
<td>200</td>
<td>0.852</td>
<td>ResNet50</td>
</tr>
<tr>
<td>Finetuned</td>
<td>200</td>
<td>0.258</td>
<td>VGG16</td>
</tr>
</tbody>
</table>

Performance metrics:
- Optimizing metric → Minimize loss
- Satisficing metric → Generator A model size < 15 mb

Conclusion
CycleGAN architecture with our finetuned model offers high precision solution for website style transfer. Results were good due to use of transfer learning and finetuning.
Novelties of the approach
- Lower error compared to baseline.
- Ability to transfer font and themes across website domains, a hitherto unexplored area.

Future Scope
We plan to extend our solution further with
- End to end website creation, by also generating code along with styles.
- Increased dataset size with complex websites containing more UI features.

Links and References
1. Github repository: https://github.com/siddhantpp/UIGAN
2. YouTube video: https://www.youtube.com/watch?v=2J0eE-AHW1e8