



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.



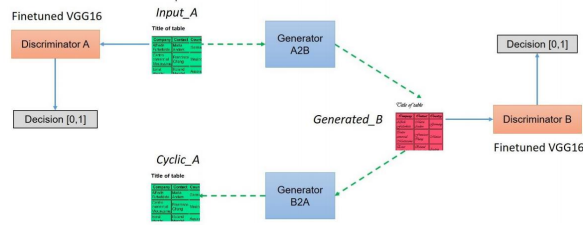
Custom table & font data

- 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



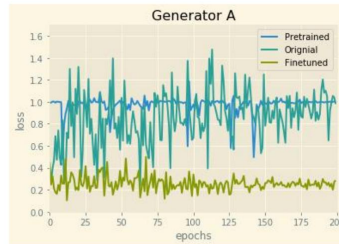
We present an analysis of results below.

Model	Epochs	Loss	Comments
Baseline	200	0.974	Original
Pretrained	200	0.852	ResNet50
Finetuned	200	0.258	VGG16

Performance metrics:

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

Our finetuned VGG16 based model as Discriminator performs better than the baseline and pretrained models by having the least loss.



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 re <https://github.com/siddhantpp/UiGAN>
2. Youtube video <https://www.youtube.com/watch?v=2J0EFAHW1e8>
3. Jun-Yan Zhu, et. al "Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks", in IEEE International Conference on Computer Vision (ICCV), 2017.