Image (Re)colorization Project
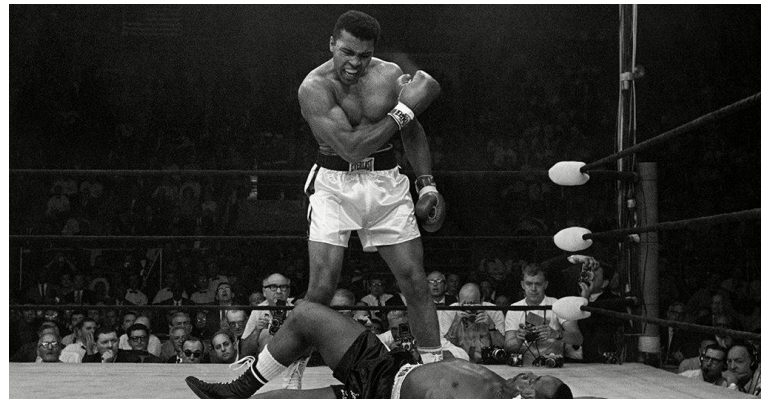
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Problem

- Color not commonly used in photography until the 1970s
- Have to guess what black & white photos may have looked like if taken with color camera
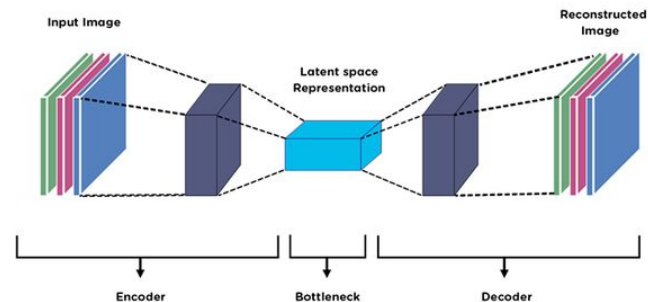- Focus: sports photos

Challenges

- Quality and modifications of old cameras
- Do not know which accuracy metric would be best to represent visual color accuracy
- Scope of photos fed into model needs to be adjusted in order to get accurate results. (ex: more landscape photos -> better landscapes)

Methods

- Baseline: Convolutional Neural Network
- Decomposition of images into light portions
  - Lightness, green-magenta, blue-yellow
- Train models using b/w image as input feature, color portions as targets
- Build models from scratch but heavy influence from pre-existing models
- Deep Convolutional Generative Adversarial Networks (DCGAN technique)

Data

- Dataset of sports photos retrieved from Kaggle (408.4 MB)
- Sample of photos from 100 different sports, including some more obscure ones, 10,000+ entries
- If needed, we may try to procure more data, particularly vintage photos


Formula 1 Racing

Baseball

Fly Fishing

Expected Outcome

- Pretrain models using our data
- Create python script that allows user to input any photo and have the pretrained models either:
    - Decompose a color photo and attempt to re-colorize it
    - Take in black and white photo and add color
- Potential avenue to explore: is it easier to recolor photos that are colorblind-friendly? (deuteranopia)
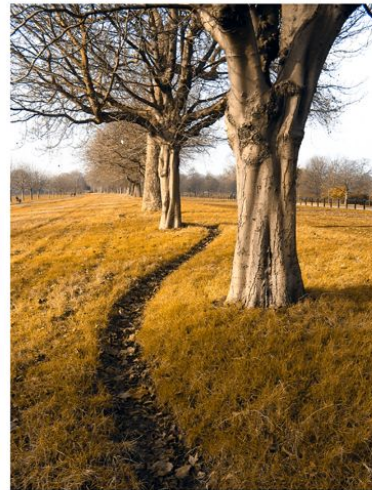
Implementation

Original

Input

Output (ECCV 16)

Output (SIGGRAPH 17)

References

- Implementing Deep Convolutional Generative Adversarial Networks (DCGAN) | by Rohan Jagtap | Towards Data Science
- https://github.com/richzhang/colorization