AI-Assisted Creative Expression: a Case for Automatic Lineart Colorization

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Contents

Abstract

Introduction

Motivations

- Machine Creativity (Computational Creativity)
  - Intersection of:
    - Artificial Intelligence
    - Cognitive Psycology
    - Philosophy
    - Art
  - Goal is to Model, Simulate or Replicate Creativity using a Computer to achieve:
    - Human-level Creativity
    - Better understand Human Creativity
    - Build Tools to Enhance Human Creativity
  - Creativity Definition (Computational)
    - Top-Down approach (Explicit Formulation + Randomness):
      - The answer is novel and useful
      - The answer demands that we reject ideas we had previously accepted
      - The answer result from intense motivation and persistence
      - The answer comes from clarifying a problem that was originally vague
    - Bottom-Up approach (Artificial Neural Nets):
      - Learn heuristics from huge corpus
      - Non-linear pattern exctraction
- Deep Learning Breakthroughs
- Rise of Generative Neural Networks
- A case for Lineart Colorization

Problem Statement

- Black & White Lineart VS Gray Scale
- Incomplete Information Challenge fo Computer Vision
- Natural Artisitic Control Back to the User

Contributions

- Recipe for curating datasets for the task of automatic colorization
- 3 Models exploring different aspect of the topic:
  - PaintsTorch: High Quality, User-Guided, Fast Realtime Feedback
  - StencilTorch: Human-Machine Collaboration, Human-in-the-Loop
  - StableTorch: Variance and Iterative Exploration

- A reflexion on Current Generative AI Ethical and Societal Impact in our Society

Concerns

- Raise awareness about
  - Deepfakes
  - Model Fabulations
  - Ownership & Copyright Ambiguities
  - Biases & Discrimination
- About this work
  - Images used only for Educational and Research Purposes
  - Only describe recipes for reproducibility
  - Dataset and Weights are not Distributed (Only Code)

Structure

- Plain Language Expanded TOC

Background

Contrib I (Find Catchy Explicit Name)

State of the Art

Method

Setup

Results

Summary

Contrib II (Find Catchy Explicit Name)

State of the Art

Method

Setup

Results

Summary

Contrib III (Find Catchy Explicit Name)

State of the Art

Method

Setup

Results

Summary

Contrib IV (Find Catchy Explicit Name)

State of the Art

Method

Setup

Results

Summary

Ethical and Societal Impact

Conclusion

References