

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

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Abstract

Introduction

Motivations

- Machine Creativity (Computational Creativity)
 - Intersection of:
 - * Artificial Intelligence
 - * Cognitive Psychology
 - * 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 extraction
- 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

History of Artificial Intelligence

Neural Networks

Autoencoders

Variational Autoencoders

Generative Adversarial Networks

Denoising Diffusion Models

Contrib I (Find Catchy Explicit Name)

State of the Art

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Contrib II (Find Catchy Explicit Name)**State of the Art****Method****Setup****Results****Summary**

Contrib III (Find Catchy Explicit Name)

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Contrib IV (Find Catchy Explicit Name)**State of the Art****Method****Setup****Results****Summary**

Ethical and Societal Impact

Conclusion

References

