

README: Advancing Human-AI Collaboration – Towards a Functional Framework for Co-Creative AI

Overview

This repository accompanies the article *"Advancing Human-AI Collaboration: Towards a Functional Framework for Co-Creative AI"*. The study investigates whether generative AI functions as an autonomous co-creative agent or a collaborative tool in the sense understood by creativity research in human-computer interaction, and how its integration challenges human-centric creativity in creative industries.

Citation

If you use or reference this work, please cite it as:

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Structure

The study follows a multiphase methodology encompassing:

1. Experimental Generation

- ✚ VNAI (Visual Non-Embodied AI): Using Stable Diffusion to generate symbolic and abstract visual representations.
- ✚ PEAI (Performing Embodied AI): Using OpenAI's Sora to generate choreographed dance performances from textual prompts.

2. Prompt Design

- ✚ VNAI Prompt-stable diffusion: "AI in the style of the creative industries"
- ✚ PEAI Prompt-stable diffusion: " robots performing synchronized dance routines on a stage with dynamic lighting "
- ✚ PEAI Prompt-Sora: " robots performing synchronized dance routines on a stage with dynamic lighting"
- ✚ PEAI Prompt-Sora: "AI performing synchronized dance routines with dynamic lighting"

3. Analytical Pipeline

- ✚ CLIP-Based Semantic Alignment to assess prompt fidelity
- ✚ Reverse Image Search for dataset dependency
- ✚ Latent Feature Analysis (PCA/t-SNE) using ResNet50
- ✚ Optical Flow Motion Tracking and Speed Variation Analysis to examine motion patterns

- ✚ Visual Comparison using framing and keyframe extraction

Contents

- ✚ images/ – Contains AI- and human-generated image outputs (framed and raw)
- ✚ videos/ – MP4 files used for kinetic analysis (AI and human performances)
- ✚ motion analysis/ – Contains speed variation plots, optical flow visualizations
- ✚ notebooks/ – Python notebooks for PCA, t-SNE, motion extraction, and CLIP alignment
- ✚ figures/ – Final figures for publication
- ✚ data_links.docx – List of Sora-generated video links and access notes

Tools and Libraries Used

- ✚ Python 3.10
- ✚ OpenCV (optical flow and keyframe extraction)
- ✚ MediaPipe (pose estimation)
- ✚ scikit-learn (PCA, t-SNE)
- ✚ PyTorch + CLIP
- ✚ ResNet50 (ImageNet pretrained)
- ✚ matplotlib, seaborn (visualizations)

Dataset Notes

- ✚ AI-Generated Data:
 - ✚ Visuals created using Stable Diffusion (locally hosted)
 - ✚ Dance performances generated via OpenAI's Sora (links provided)
- ✚ Human Reference Data:
 - ✚ Stills and video segments of professional human dancers were included for comparative analysis.
 - ✚ Due to copyright considerations, only selected frames are distributed.

Limitations

- ✚ Optical flow tracking does not account for semantic meaning or emotional content of motion.
- ✚ Analysis does not include real-time co-creation or live audience interaction.
- ✚ CLIP alignment focuses on prompt fidelity and may overlook deeper aesthetic interpretations.

Potential Use and Reuse

This framework can be applied or extended to:

- ✚ Assess dataset dependency and originality in AI-generated media
- ✚ Evaluate co-creative potential in visual and performative arts
- ✚ Inform policy development and ethical standards in AI-assisted creative industries
- ✚ Compare embodied vs. non-embodied AI creativity using empirical techniques

Contact

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