Is it Real Art? The Endless Cycle of AI Generated Creativity

Github Repository: https://github.com/luk-ryan/eecs-4461-group-11

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Section 1

Our phenomenon of interest is AI-to-AI interaction in creative fields, specifically visual art. With the rise of advanced generative models, AI models are being made both to create art pieces based on various text prompts, as well as analyze pieces of art. The questions we are trying to answer is how AI generally seems to engage or critique artwork created by another AI, and if it does prefer AI generated art over human generated art, then what does this mean for the future of art? This phenomena challenges traditional perceptions of creativity as being something which is uniquely human.

Section 2

Article 1: https://www.mdpi.com/2076-3417/12/22/11312

The article *Communication in Human–AI Co-Creation: Perceptual Analysis of Paintings Generated by Text-to-Image System* explores human to AI collaboration in visual art, focusing on communication differences between artists and non-artists using the Midjourney

platform. Ten artists as well as ten non-artists co-create paintings, and their actions, reflections, and generated images are analyzed through a visual question-answering task.

The study's findings are as following:

1. Artists exhibited distinct creative behaviors and attitudes linked to their expertise, although AI blurred differences in painting techniques developed through professional training
2. Emotional communication was found to be more important than formal features and semantic matching in human-AI interactions.

Article 2: https://doi.org/10.1016/j.heliyon.2024.e25388

The article *Exploring the Transformative Power of AI in Art* reviews how AI influences artistic creation and sustainability, analyzing 60 studies on AI-generated content, sustainable production, and creative processes. It highlights how AI shapes artistic trends but lacks focus on AI-to-AI interactions. This relates to our research by reinforcing concerns about AI-driven artistic homogenization and bias formation in AI-curated art, supporting our investigation into echo chambers and self-reinforcing trends in AI art systems. Our study builds on this by specifically measuring when AI-generated art overtakes human influence and whether AI critics favor AI art over human-created work.

References

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transformative power of AI in art through a circular economy lens: A systematic literature review. *Heliyon, 10*(4), e25388.

Section 3

The Boid Flocking model can be a helpful analogy for understanding AI-to-AI interaction in creative fields, specifically visual art. Just as boids (agents) follow simple rules to interact and create complex patterns, AI models in the study would interact with each other based on their respective roles: one generates artwork and the other analyzes it. The rules of Boid Flocking—separation, alignment, and cohesion—mirror how these AI systems would collaborate, with one AI potentially guiding or critiquing the other. This interaction shows that, much like the coordinated movement of boids, AI-generated art can lead to unexpected and creative outcomes. This also raises questions on whether AI can recognize or engage with artwork in a way similar to human perception and critique.

§3.1 Entities

1. Human Art Generators – Human artists who create original artwork at the start of the simulation.
2. AI Art Generators – AI models that generate new artwork by drawing inspiration from existing human and AI-generated art.
3. AI Critics – AI models that evaluate and rate artwork, influencing which styles become dominant.
4. AI Curators – AI models that promote and push for artwork that is ranked highly by AI Critics

§3.2 Affordances:

1. Rating & Feedback

    - AI Critics evaluate both AI and human art, providing numerical scores and feedback.
    - Feedback impacts future art, influencing AI generators and human artists.

2. Influence Mechanism

    - AI Art Generators adjust their style based on feedback.
    - Human artists may collaborate with or compete against AI styles.

3. Style Evolution

    - Preferred styles gain popularity, influencing future artwork.
    - AI and human artists may start mimicking highly rated styles.

4. Trend Formation

    - AI Curators highlight trending art.
    - Styles with high engagement spread across the system.

5. Data Tracking & Analytics

    - Logs key data:
        - Which styles are preferred
        - How AI and human art evolve
        - Feedback loops that shape future trends
        - Helps predict artistic movements and shifts.

§3.3 Algorithms:

1. Reinforcement Learning: AI Art Generators iteratively refine their styles based on critical feedback. By favoring high-scoring styles, the system learns to prioritize certain aesthetics, which may reinforce artistic trends over time and reduce stylistic diversity.
2. Content Prioritization Algorithm: AI Curators rank and promote artworks that receive the highest ratings from AI Critics. This algorithm determines which styles gain

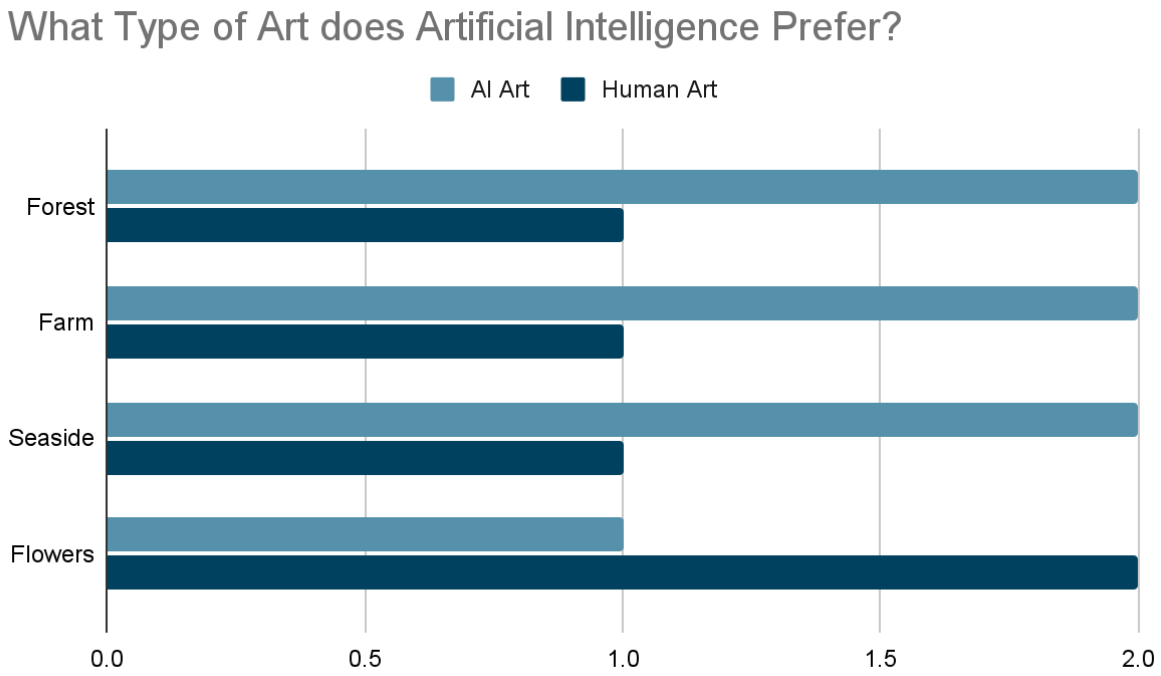
visibility, potentially leading to the overrepresentation of certain aesthetics while suppressing artistic diversity.

3. Recommendation System: AI Critics and Curators analyze past preferences and suggest new artistic styles for AI Art Generators. The system encourages exploration of new designs but may also reinforce dominant trends, limiting the emergence of unique styles over time.
4. Bias Detection Model: Tracks AI Critics' preferences to identify biases in rating patterns. If Critics consistently favor AI-generated works over human art, or certain stylistic choices, the model detects bias trends, helping measure the formation of artistic echo chambers.

Section 4

A successful simulation of our phenomena of interest would show itself in the following manner:

A grid displaying The difference between the evaluation of an AI generated art piece in comparison to a real piece of artwork within the same realm (for example a painting of the forest or the sea). A set of graphs or counters would display the frequency of positive and negative evaluations, tracking the critique preferences over time.



Anticipated Outcome

If the AI critique agents consistently prefer the AI-generated art, the simulation will show a trend where more agents start to give positive evaluations over time.

Observers would see the overall preference of critique agents shift towards AI-generated art in the visual output, especially if it continues to outperform other art types in terms of critique scores.