

STEMULATE PROGRAM

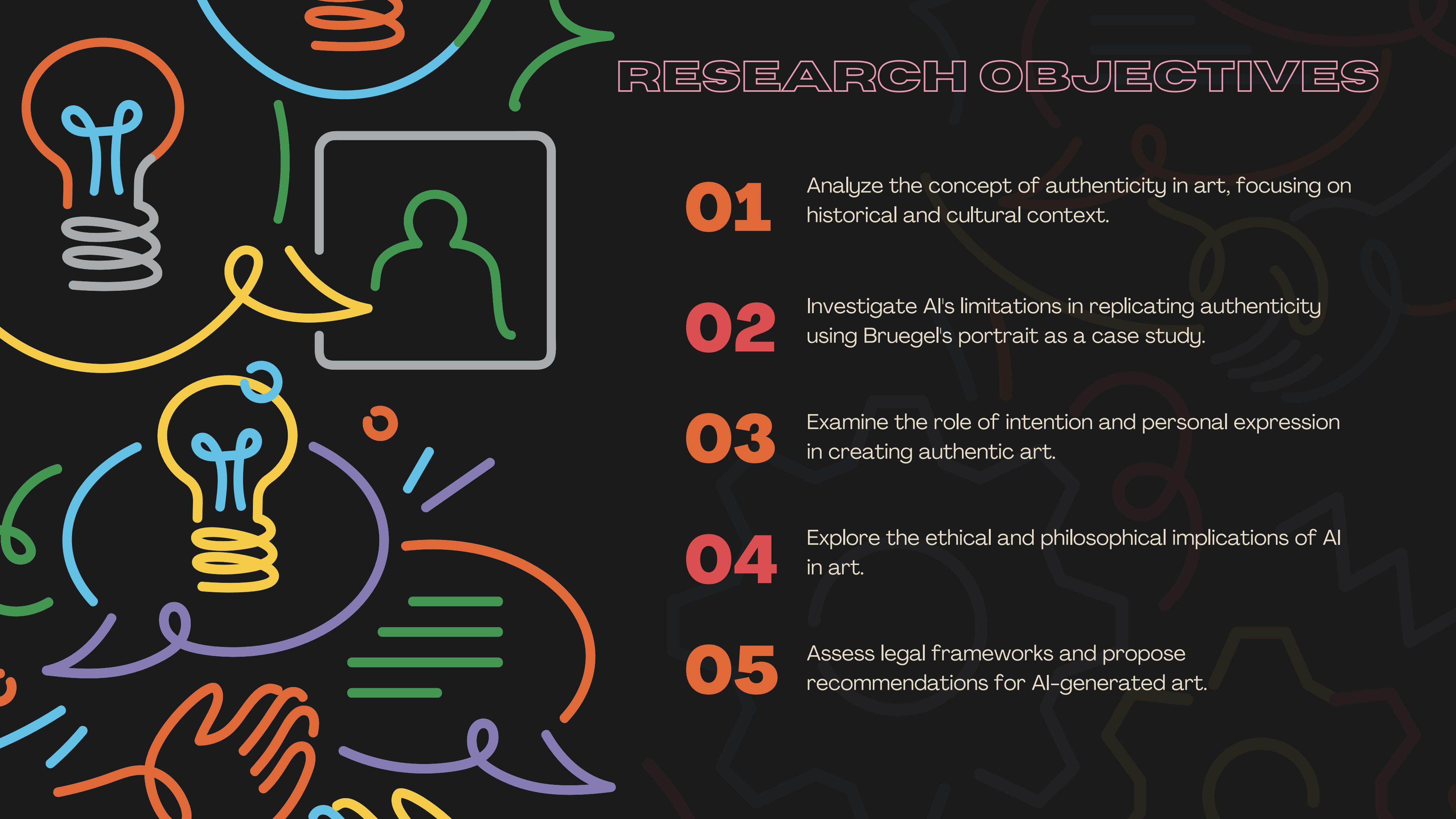
**THE
LIMITATIONS OF
AI IN ACHIEVING
AUTHENTICITY
IN ART: A
COMPARATIVE
ANALYSIS
USING PIETER
BRUEGEL THE
ELDER'S
PORTRAIT**

BY DILARA CALISKAN

INTRODUCTION

AI has transformed many fields, including art. This presentation explores AI's limitations in replicating the authenticity of historical masterpieces, focusing on Pieter Bruegel the Elder's "Proverbs." Despite AI's technical capabilities, it struggles to capture the emotional and cultural depth of Bruegel's work.





RESEARCH OBJECTIVES

01

Analyze the concept of authenticity in art, focusing on historical and cultural context.

02

Investigate AI's limitations in replicating authenticity using Bruegel's portrait as a case study.

03

Examine the role of intention and personal expression in creating authentic art.

04

Explore the ethical and philosophical implications of AI in art.

05

Assess legal frameworks and propose recommendations for AI-generated art.

METHODOLOGY

01 SELECTION OF AI TOOLS

02 GENERATION OF AI-ARTWORKS

03 QUALITATIVE EVALUATION BY ART EXPERTS

04 QUANTITATIVE VIEWER PERCEPTION STUDY

04 CONCLUSION AND REFLECTION ON METHODOLOGY

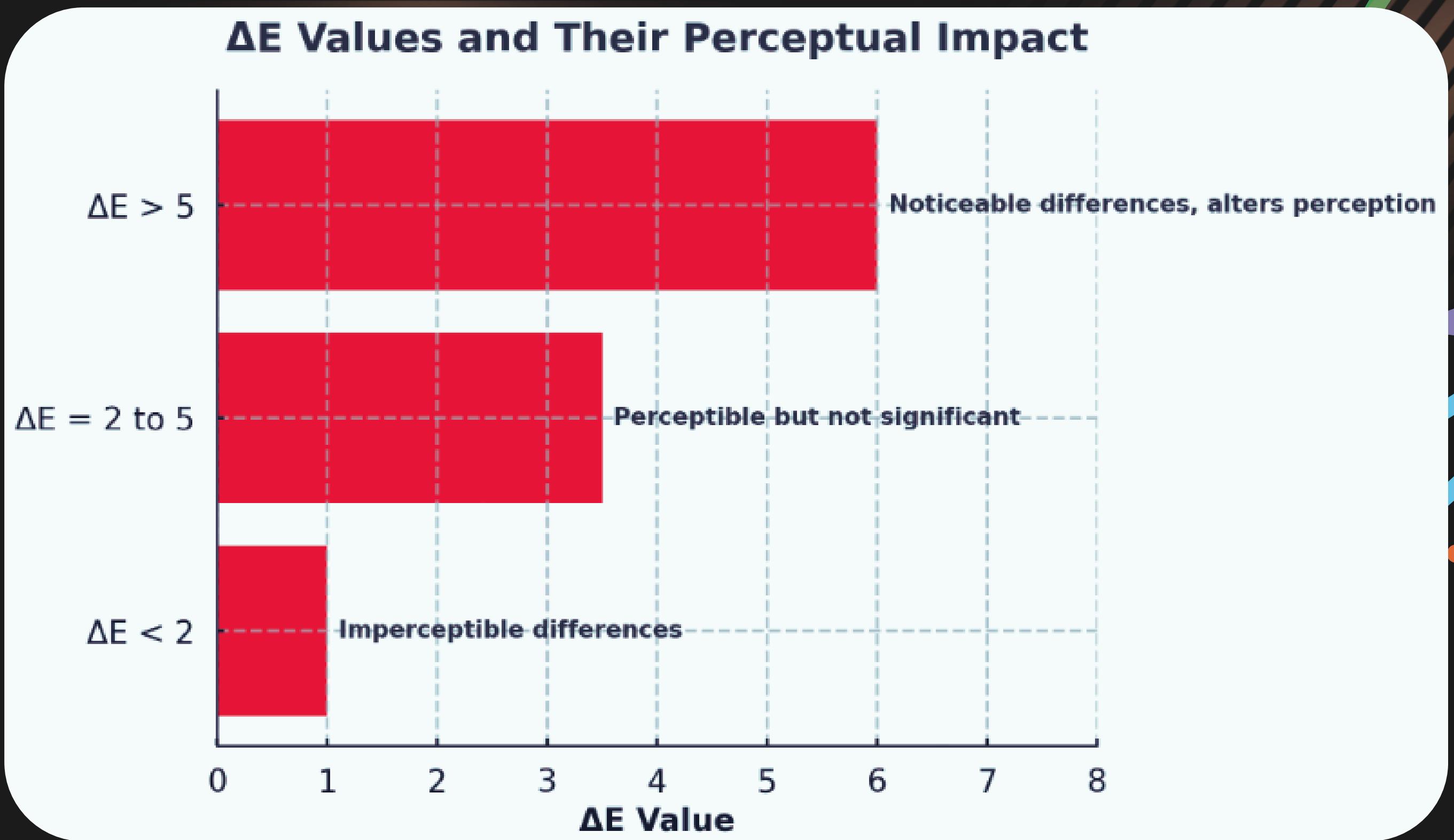


ORIGINAL



AI-GENERATED

ΔE IS A METRIC THAT REPRESENTS THE DISTANCE BETWEEN TWO COLORS IN A THREE-DIMENSIONAL COLOR SPACE. A ΔE VALUE OF 0 MEANS THE COLORS ARE IDENTICAL, WHILE HIGHER VALUES INDICATE GREATER DIFFERENCES.



▼ HSL(A)	
Hue	hsl(35, 42%, 30%)
Saturation	35
Lightness	42
► HSV / HSB	
▼ CMYK	
Cyan	cmyk(0, 0.246, 0.592, 0.574)
Magenta	0
Yellow	24.65
Key/Black	59.15
▼ Lab (CIELAB, CIE-L*a*b, L*a*b)	
Lightness	57.4
A (Green→Red)	lab(36.79, 6.35, 26.09)
B (Blue→Yellow)	36.79
A (Green→Red)	6.35
B (Blue→Yellow)	26.09

- ORIGINAL ARTWORK:

- L1 = **36.79**
- A1 = **6.35**
- B1 = **26.09**

E VALUE EQUALS TO 8.92

▼ HSL(A)	
Hue	hsl(31, 47%, 24%)
Saturation	31
Lightness	47
► HSV / HSB	
▼ CMYK	
Cyan	cmyk(0, 0.199, 0.619, 0.647)
Magenta	0
Yellow	30.91
Key/Black	61.96
▼ Lab (CIELAB, CIE-L*a*b, L*a*b)	
Lightness	64.72
A (Green→Red)	lab(28.75, 8.51, 22.86)
B (Blue→Yellow)	28.75
A (Green→Red)	8.51
B (Blue→Yellow)	22.86

- AI-GENERATED:

- L2 = **28.75**
- A2 = **8.51**
- B2 = **22.86**



Technical Metric	Original Artwork	AI Reproduction	ΔE Value	Texture Fidelity (Wavelet Analysis)	Structural Accuracy (Edge Detection)
Pieter Bruegel's "The Dutch Proverbs"	Complex textures, intricate details	Noticeable texture mismatches	8.92	78% replication of texture patterns	85% structural fidelity
Van Gogh's "Café Terrace at Night"	Vibrant colors, dynamic brushstrokes	Color inaccuracies, texture loss	7.99	70% replication of texture patterns	90% structural fidelity
Leonardo da Vinci's "The Last Supper"	Subtle light-shadow interplay, fine details	Light-shadow mismatch, texture loss	8.14	75% replication of texture patterns	85% structural fidelity

LITERATURE REVIEW

AI in art has sparked debates about creativity and authenticity. While AI can replicate styles, it often lacks the emotional depth and personal narratives that characterize human-created art. This section highlights key studies and theories related to AI-generated art and authenticity.



CASE STUDIES: AI-GENERATED ARTWORKS



Artist Harshit Agrawal of Bangalore based in India, input 60,000 human anatomy pictures into the algorithm, created a series of abstract paintings like crimson blizzards, and finally produced works of art with unique aesthetics of AI.



Edmond de Belamy is a generative adversarial network (GAN) portrait painting constructed by Paris-based arts collective Obvious in 2018 from WikiArt's artwork database.

KEY FINDINGS

AI-GENERATED VERSIONS OF "PROVERBS" WERE VISUALLY IMPRESSIVE BUT LACKED THE EMOTIONAL NUANCE AND CULTURAL CONTEXT OF BRUEGEL'S ORIGINAL. EXPERTS HIGHLIGHTED AI'S INABILITY TO REPLICATE SYMBOLIC ELEMENTS AND NARRATIVE STRUCTURES, LEADING TO A PREFERENCE FOR THE ORIGINAL AMONG VIEWERS.

FINDING 1: VISUAL FIDELITY VS. EMOTIONAL DEPTH

FINDING 2: LOSS OF CULTURAL AND HISTORICAL CONTEXT

FINDING 3: FRAGMENTATION IN NARRATIVE STRUCTURE

FINDING 4: TECHNICAL PROFICIENCY VS. ARTISTIC INTENT

FINDING 5: VIEWER PREFERENCE FOR THE ORIGINAL



**OVERDESCRIPTION
IN WRITING**

**TIME
CONSTRAINTS**

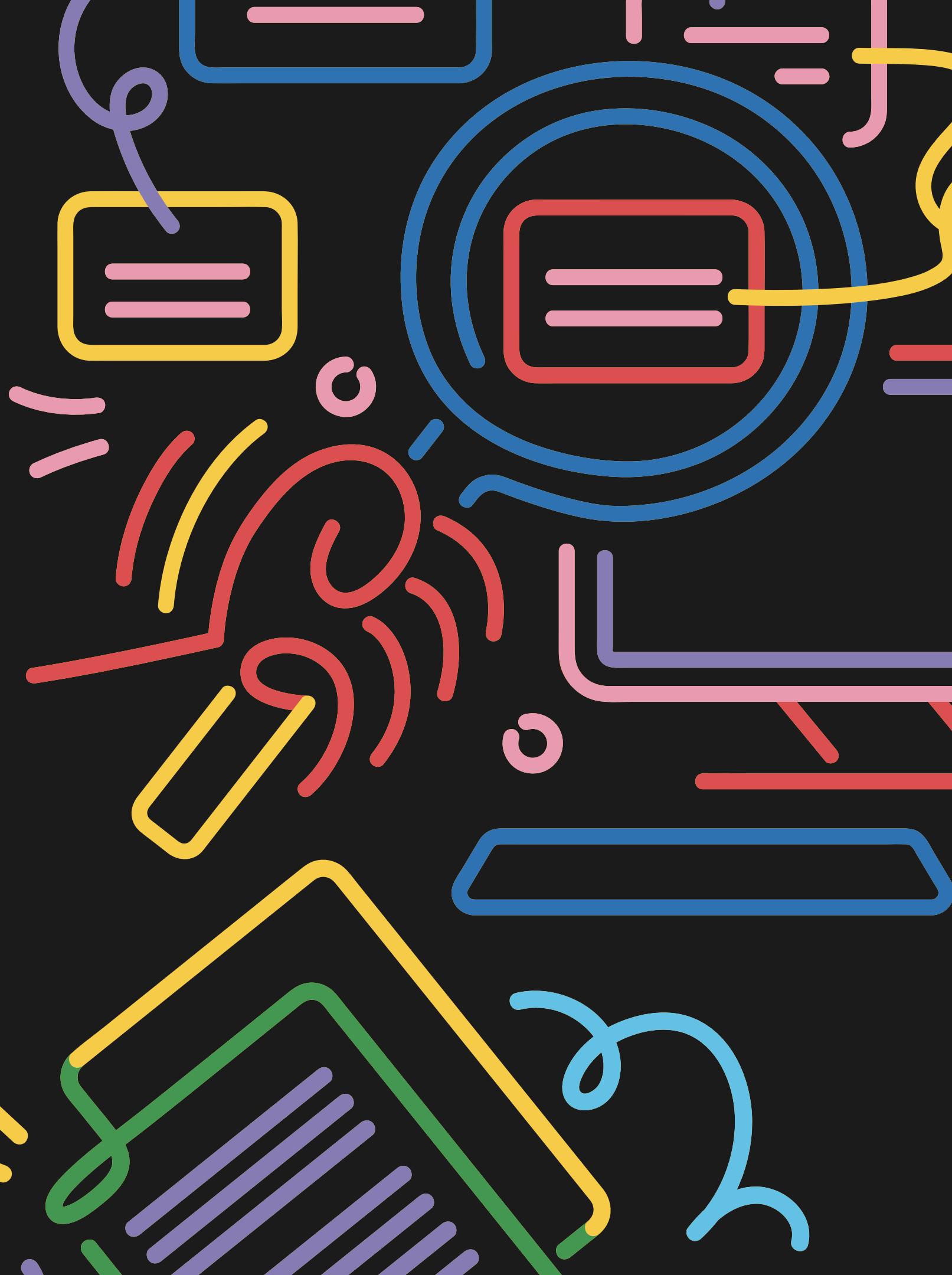
CHALLENGES & LIMITATIONS

**ENGAGEMENT &
LIMITED SAMPLE
SIZE**

**INSUFFICIENT
THOROUGHNESS IN
EXISTING
LITERATURE**

CONCLUSION

AI has notable **limitations** in achieving **artistic authenticity**, particularly in replicating the **emotional** and **cultural depth** of **historical masterpieces** like Bruegel's "Proverbs." Future **AI developments** must address these gaps to enhance the **authenticity** of **AI-generated art.**





FUTURE RESEARCH

Further **research** should focus on improving **AI's ability** to incorporate **cultural** and **emotional layers** into **art**. **Ethical considerations** and **legal frameworks** must also evolve to address the growing **influence of AI** in the **art world**.



A central brain-like network diagram composed of various colored lines (blue, red, yellow, purple, green) forming loops and connections. Several rectangular boxes with horizontal lines inside are integrated into the network, suggesting memory storage or processing units. The background is dark, making the colorful lines stand out.

THANK
YOU FOR
LISTENING!