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Corresponding author:
Patrick Cheong-lao Pang

mail@patrickpang.net

Author Affiliation:
Macao Polytechnic University.

Yang, JH; Liu, T; Cheng, YY; Luo, YM; Pang, PCI.

ADMINISTRATIVE INFORMATION

Support - Macao Polytechnic University.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2024110025

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 6 November 2024 and was last updated on 6 November 2024.

INTRODUCTION

Review question / Objective (1) What is the current distribution of literature in this field (by country and publication year)? (2) What are the types of existing research, the characteristics of the research subjects, and the variables involved? (3) What are the methods of AI art generation, emotional expression and recognition forms of emotional expression and recognition, and emotional measurement methods? (4) What are people's attitudes towards AI art regarding emotional expression, and what are its ethical and social impacts? (5) What are the key findings and limitations of these studies?

Background Although artificial intelligence (AI) lacks genuine emotions, it creates unprecedented avenues for emotional expression, wherein AI, by deeply learning from human emotional data, can

convincingly simulate human responses through facial expressions, body language, and speech patterns. In interactive design, these simulated expressions allow AI not only to evoke empathy but also to foster emotional connections with users through mechanisms such as eye contact and body language, which humanize interactions in digital contexts. Furthermore, the capacity for emotional expression in AI's artistic creations, ranging from painting to music and poetry, demonstrates how AI-generated artworks can convey complex emotional states—including sadness, joy, and anger—capable of resonating with and moving audiences in ways similar to human art.

AI art, which spans diverse fields such as visual arts, music, dance, film, and television, relies on advanced generative technologies, such as generative adversarial networks (GANs) and natural language processing (NLP), which enable intricate

and innovative artistic expressions. As AI art takes various forms, including visual media like digital paintings and video productions, it also extends to multi-sensory experiences such as synthesized music and choreographed dance, which broaden both the scope and depth of artistic creation. This interdisciplinary integration, whereby technological and creative fields merge, not only expands the boundaries of creative practice but also positions AI art as a significant emerging mode of cultural expression.

Emotional expression, which is traditionally understood as the externalization of internal emotional states, involves non-verbal communication through facial expressions, voice, body language, and other means, playing a crucial role in daily interactions as well as in artistic creation. In traditional artworks, elements such as color, shape, and rhythm serve as conduits for emotional resonance, allowing audiences to experience a form of non-verbal communication that engages them on an emotional level. In AI art, where emotional expression can offer an additional layer of complexity, audiences are enabled to engage with intricate emotional processes, thereby enriching their overall emotional experience.

Rationale Despite the existing literature examining AI art and its potential for emotional expression, significant limitations remain. While some studies have conducted literature reviews on creativity and emotion in AI art, they typically covered only four databases, resulting in a relatively narrow thematic scope. For instance, some studies focused specifically on artificial emotional intelligence within visual media; however, their study was limited by a short research span and did not account for the diversity of emotional expression across various AI art forms. Other studies investigated emotional expression in visual art primarily from an aesthetic perspective, yet their approach was constrained by philosophical and aesthetic frameworks, with limited database sources and a restricted thematic range. Additionally, some reviews have explored EEG-based emotion recognition but targeted a narrower research focus, failing to comprehensively address emotional expression in AI art as a whole.

To address these gaps, this study aims to broaden the content scope and data coverage by conducting a systematic review across five databases that encompass a wider range of subjects, including art, sentiment analysis, user interaction, virtual socialization, and mental health. By doing so, this research intends to systematically investigate the relationship and interaction between AI art and emotional

expression, examining the specific implementations of different AI art forms, types of emotional expression, and methods for measuring emotions within this context.

METHODS

Strategy of data synthesis The data were systematically collected, summarized, and analyzed using descriptive statistics to characterize the sample articles. The findings were presented in a descriptive format, enhanced with graphs and charts for clarity. The results were interpreted through a narrative synthesis to address the specific research questions of the review. All authors collaboratively validated the findings.

Eligibility criteria The reports in this systematic scoping review adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Review (PRISMA-ScR) guidelines. In this study, relevant literature was screened from five databases: Web of Science, Scopus, Engineering Index (EI Compendex), Arts & Humanities Citation Index (AHCI), and PsycINFO. The search date was October 5, 2024, and the search terms included “artificial intelligence,” “emotion,” “emotion expression,” and “emotion recognition. The search date is October 5, 2024, and the search terms include “artificial intelligence”, “emotion”, “emotion expression”, “emotion recognition”, etc. The search strategy includes the following steps. The search strategy included the following steps: (1) preliminary screening of all databases to exclude irrelevant studies; (2) de-weighting using Endnote software; (3) further screening of the literature according to the titles and abstracts; and (4) final reading of the whole text to exclude the literature that is not directly related to the research topic.

Source of evidence screening and selection All retrieved records are exported to Endnote software, and any duplicate entries are removed. Two independent reviewers initially screened the title and abstract of the article based on the inclusion criteria. Differences between two reviewers shall be resolved through negotiation with the third reviewer. Inclusion criteria included (1) the use of AI in sentiment or emotion expression analysis or the use of emotion recognition techniques; (2) the study focused on the practical application and analysis of sentiment, emotion expression, or emotion recognition; and (3) the use of AI for sentiment analysis, emotion recognition, or emotion expression identification and modeling. (4) The type of research is an

original research article; (5) The full text is written in English.

Data management We developed a data extraction form following the methodological guidelines for scoping reviews established by the Joanna Briggs Institute. After testing the form with five articles, we made further adjustments. The form included items such as author, year, country, study types, research field, sample types, variables, AI art forms, perceptual forms, emotion recognition, types of emotional expression, measures of emotional expression, attitudes, impacts, findings, and limitations. Two independent reviewers conducted the data extraction, and any discrepancies were resolved through consultation with a senior reviewer.

Language restriction Yes. Full text in English.

Country(ies) involved Macao Special Administrative Region, China.

Keywords AI; Art; Emotional expression; Systematic scoping review.

Contributions of each author

Author 1 - Jinhua Yang - Author 1 proposed and designed this study.

Email: yeohgenghwa@outlook.com

Author 2 - Ting Liu - Author 2 proposed and designed this study.

Email: p2314982@gmx.edu.mo

Author 3 - Yanying Cheng - Author 3 helped with data analyses and resolved disagreements in the review process.

Email: chengyanring@hotmail.com

Author 4 - Yiming Luo - Author 4 supervised and provided resources for this work.

Email: p2417889@mpu.edu.mo

Author 5 - Patrick Cheong-lao Pang - Author 5 supervised and provided resources for this work.

Email: mail@patrickpang.net