Digital Art Therapy with Gen AI: Mind Palette

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Abstract—**Proper and delightful intervention can reduce the progression of mental disorders, but numerous physical and psychological barriers continue to exist. In response, we developed a mobile application called "Mind Palette", which incorporates art therapy methodologies and generative AI technology. This application aims to address the need for comprehensive interventions in the mental health crisis, particularly among younger age groups. With AI chatbot interactions and AI-generated artwork recommendations, the application may facilitate discussions about emotions, encourage self-expression through art creation, and provide cognitive-behavioral therapeutic advice in both verbal and visual ways. The project highlights the human-centered approach and investigates the potential of generative AI as an effective agent for conducting art therapy.**

Index Terms—**Generative AI, Art therapy, Affective Computing, E-Mental Health Applications**

I. INTRODUCTION

In the United states, the prevalence of depression among individuals stands at approximately 8.4%, and the highest rate of depression, 17%, was observed among individuals aged 18 to 25 in the year 2020 [1]. The Centers for Disease Control and Prevention (CDC) reports a worsening trend in adolescent mental health, with over 42% of students persistently sad or hopeless and nearly 29% experiencing poor mental health in 2021 [2]. These statistics highlight the urgent need for comprehensive interventions to address the escalating mental health crisis, particularly among younger age groups.

A significant concern arises from the fact that nearly half of individuals with mental illness do not receive the essential treatment due to the psychological and physical burdens associated with visiting hospitals or therapeutic centers [3]. Furthermore, there is a cultural tendency to overlook the issue of mid-low level mental disorders, resulting in a lack of protection to prevent these conditions from progressing into severe mental disorders within our daily lives.

To mitigate this phenomenon, numerous studies indicate that dedicating time to emotional focus can effectively prevent the development of severe mental disorders. While various techniques such as meditation, journaling, and exercise for self-directed emotional regulation, this study centers on the utilization of "Art" as a therapeutic approach. Art therapy connects with people's mind, body, and spirit in various ways that are different from verbal communication alone [4]. According to the "PERMA model" proposed by Martin Seligman, there are five fundamental elements to human well-being and flourishing: positive emotions, engagement, relationships, meaning, and achievement [5]. Art and drawing can elicit positive emotions through the exploration of intriguing subjects, active engagement through planning and self-expressions, facilitate rapport between therapists and participants, promote meaning to participants through choices of color and form, and give a sense of accomplishment upon the completion and subsequent sharing or appreciation of artwork [6], [7].

The value of conventional art therapy lies in its ability to facilitate creative methods of expression through active art-making or visual art media. It provides users with creative processes and actual healing experiences [8], [9]. The questions that art therapists ask to users exhibit identifiable patterns based on users' response. These features have potential to be digitized and extended through implementation of voice-based generative AI conversational interactions. Additionally, the utilization of generative artificial intelligence holds promise in effectively training and generating recommendations for specific artworks, colors, and images, thereby augmenting the therapeutic outcomes of art therapy sessions. Also, Generative AI can give sophisticated dialogue that can simulate a therapeutic conversation style with empathic support [10] and provide ambiguous situations and conversations [11], which are important in conventional art therapy with human therapists and counseling conversation.

Hence, "Mind Palette" aims to offer easily accessible and pleasurable therapeutic functionalities rooted in art therapy methodologies and generative AI technology by collaborating with a certified Art therapist.the program comprises three elements:

- Facilitating discussions about users' emotions through the appreciation of artwork and the exploration of their innermost feelings.
- Creating art using generative AI and engaging in conversations with an AI art therapist agent.
- Utilizing AI advice to reframe and overcome negative thoughts, while transforming drawings into a conduit for positive emotions.

II. TECHNICAL CONTRIBUTIONS

"Mind Palette" was developed using MIT App Inventor [12]. By incorporating GPT3 [13] and Dall-E [14], our team makes conversational and open-ended personalized experiences with artificial intelligence.

One of the main technical features of "Mind Palette" is its ability to appreciate artworks (Figure 1). The application provides users with a selection of artworks tailored to their emotional state, encompassing positive, neutral, or negative

Fig. 1: First part of Mind Palette App

feelings. Users can engage in a conversation with the chatbot powered by GPT, who provides a brief explanation of the artwork. To elicit deeper emotional responses, GPT poses personal questions such as "How do you feel when you see this art?" or "Can you describe the emotions evoked by the color/shape?". Importantly, GPT adapts its follow-up questions based on the users' responses, tailoring the conversation to their specific emotional state.

Another significant feature of "Mind Palette" is the ability for users to draw their own art on a canvas (Figure 2). They can choose to use drawing tools or receive assistance from generative AI. During the drawing session, GPT initiates discussions on various topics such as the users' day, dreams, or general concerns. Users can interact with GPT via voice or text, requesting the creation of specific images, alterations of colors, or adjustments to the overall mood of their drawing. In this phase, "Mind Palette" imports images from Dall-E, further enhancing the creative possibilities.

The session is composed of two sections. Section 1 of the session involves the AI agent assuming a passive role, focused on gathering information from users. The AI agent aims to understand the users' emotional state and daily experiences, fostering self-reflection. The questions are carefully designed to prompt users to express themselves and provide insights into their inner thoughts and feelings. Examples of such questions include prompts like "Let's draw something that describes your dream," "What is that person/animal/character doing?" or "If you were to step into this picture, where would you go?". By actively engaging users in the drawing process and encouraging self-reflection, the AI agent creates a space for users to express their emotions artistically while gaining a deeper understanding of their own experiences.

Section 2 of the drawing session sees the AI agent adopting a proactive role in assisting users mental state. After summarizing the users' feelings based on their artwork and responses, the AI agent provides suggestions for interpreting the emotions

and how this can be presented into a an art image. The user can automatically create an art using Dall-E based on the response that ChatGPT have provided or tailor the prompt based on their taste. The user further directly adjust the art by adding different colors and drawings or again using Dall-E to edit the artwork.
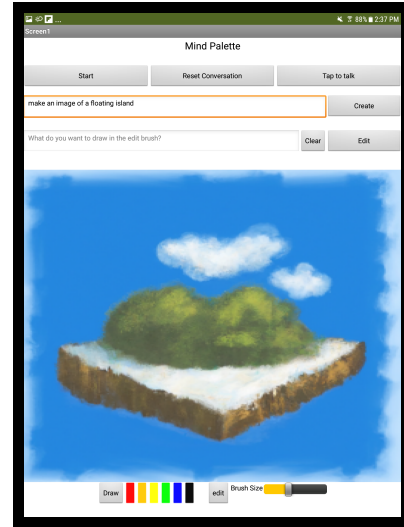

Fig. 2: Second part of Mind Palette App

By integrating these two sections, "Mind Palette" creates an interactive and supportive environment that encourages users to express themselves artistically, reflect on their emotions, and receive guidance in reframing experiences.

While numerous generative AI-based programs are available, the majority of them prioritize enhancing the efficiency of delivering users' desired outcomes, rather than facilitating the improvement of individual's mental well-being and encouraging introspection. The AI agent's active role in posing thought-provoking questions and providing uplifting suggestions aligns with principles of user-centered design and emotional well-being. This approach offers users the opportunity to engage in a therapeutic and personalized artistic experience, leveraging the capabilities of MIT App Inventor, GPT-3, and Dall-E. The integration of AI technologies within "Mind Palette" showcases the potential for conversational and open-ended personalized experiences, facilitating emotional exploration and creativity.

III. ETHICAL IMPACT STATEMENT

Since "Mind Palette" aims to delve into individuals' emotions and daily lives, protecting privacy is essential. It is crucial to establish a robust system to keep users' data safe and refrain from sharing it with third parties, including mental health centers, without users' approval. Also, the uncontrollability of Generative AI can be a potential risk, due to the lack of complete control over AI-generated conversational streams. Extensive usability testing is necessary to assess reliability and appropriateness. Lastly, collaborative discussions with

clinicians are needed to determine the risks of focusing on deeper emotions without human clinician involvement.

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